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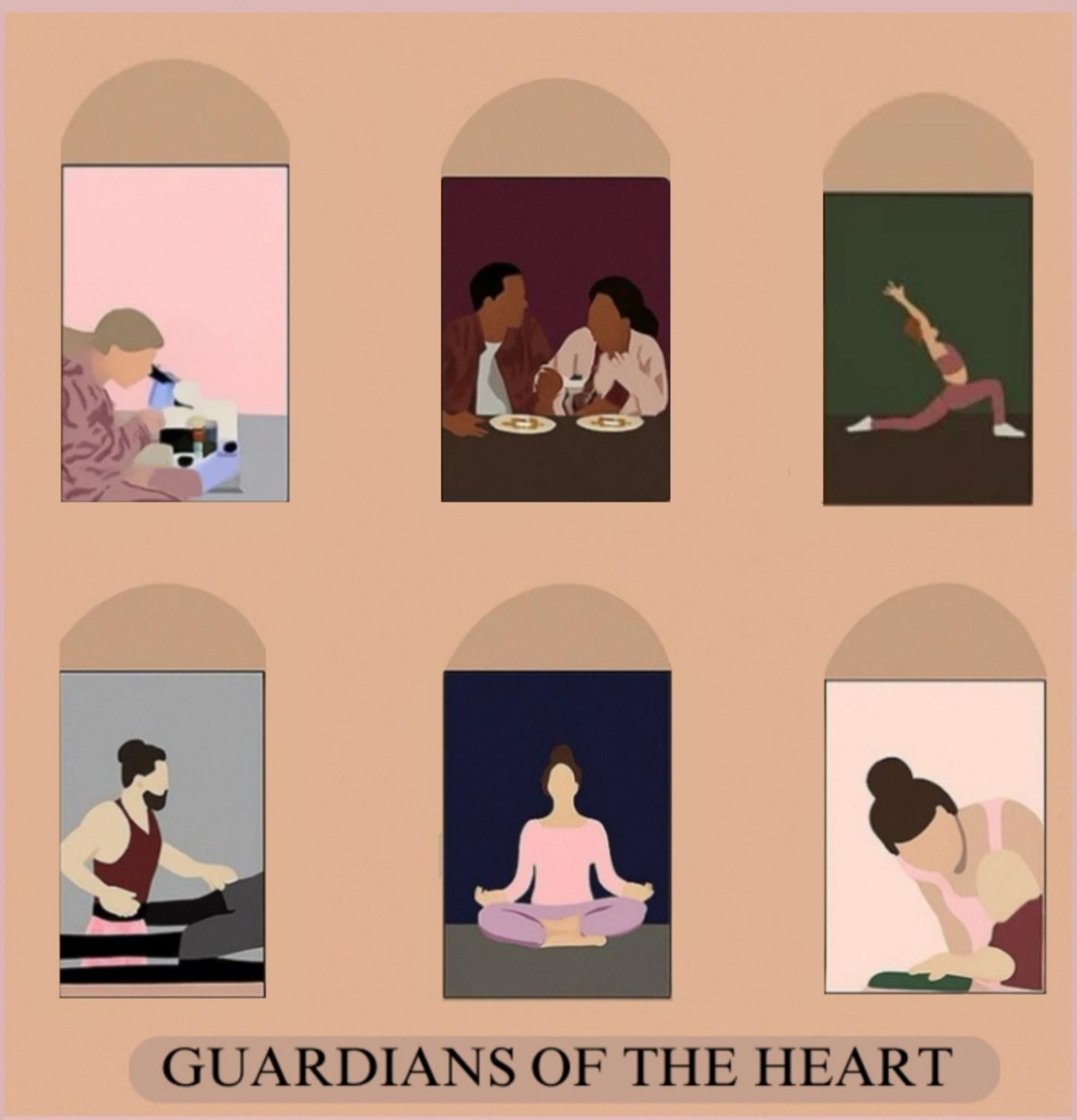
HEARTLINE

A youth-powered publication raising awarenss, sharing insights, and inspiring action for a healthier heart at every age.



Guardians of the Heart

Heartline | Summer 2025 Edition

Mission Statement

Guardians of the Heart is a 501(c)(3) nonprofit organization dedicated to providing accessible cardiovascular health education and heart disease prevention for youth. Through interactive workshops, CPR training, community screenings, and engaging educational events, we empower young people to understand the importance of heart health and early prevention. Our youth-centered approach fuels our mission to inspire the next generation to take an active role in their wellness and become advocates for healthy living. Together, we envision a future where heart disease is prevented before it starts, and every young heart is strong and resilient.

Contact & Submissions

We welcome your feedback, article submissions, and partnership inquiries. Please email: contact@guardiansoftheheart.net.

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Contents

Heart Diseases

A broad range of heart conditions that impact the heart and blood vessels throughout the body, leading to strokes, high blood pressure, etc.

Created By: Evelyn Wu

Arrhythmia

- ***Abnormal heart beat***, a normal heart beat is between 60 and 100 bpm
- Atrial fibrillation, a type of arrhythmia, contributes to ***44 deaths a day*** and an increase risk of stroke

Heart Failure

- Also knownas ***congestive heart failure*** - a serious condition where the heart can not pump enough blood around the body
- Heart failure can be ongoing (***chronic***) or may start suddenly (***acute***)
- Generally develops after other conditions that have damaged or weakened your heart - chronic In the
- US, approximately ***6.7 million adults*** over 20 have had heart failure

Heart Murmur

- A ***swishing or whooshing*** sound that occurs between the sounds of the heartbeat, caused by turbulent blood flow
- Can be harmless, or a sign of heart disease
- Heard through a stethoscope

Atherosclerosis

- ***The most common cause of heart disease***
- Plaque built up inside your arteries, contributing to an increased blood pressure (***hypertension***)
- Can lead to a heart attack and/or stroke if left untreated

Heart Attack

- Coronary arteries are blocked & ***stops oxygen supply to the heart***
- Symptoms can vary between men and women
- There are approximately 57,000 hospitalizations for heart attacks every year

Cardiomyopathy

- A type of heart disease that prevents the heart from pumping blood around the body which ***leads to heart failure***
- Five main types of cardiomyopathy
- Affects the cells and vessels in the heart affecting the the spread of blood

Hypertension

- ***High blood pressure***
- Leads to other conditions like ***heart disease***
- A normal blood pressure is ***<120*** for systolic, and ***<80*** for diastolic pressures
- An estimated 122.4 million/ 47% of adults in the US have hypertension

Cardiac Arrest

- The heart ***suddenly stops pumping blood,*** will cause ***sudden death within 10 minutes***
- ***90% chance of death*** if it occurs outside a hospital

Common Symptoms of Heart Related Conditions

- Heart palpitations
- Chest pain/tightness
- Abnormal heart rate
- Dizziness
- Shortness of breath
- Sudden collapse
- Difficulty breathing
- Loss of consciousness
- Nausea or vomiting
- Fatigue
- Trouble concentrating
- Sudden weakness
- Fluttering in the chest

How are these conditions diagnosed?

- Electrocardiogram (***ECG***)
- Echocardiogram
- Chest X-ray
- Blood test
- Magnetic resonance imaging (***MRI***)
- Genetic testing
- Stethoscope
- Stress test
- Myocardial biopsy

Common Causes

- High blood pressure
- Smoking
- Genetics
- Stress
- Diabetes
- Sleep apnea
- High cholesterol
- Heart tissue damage
- Other heart diseases
- Physical activity
- Drug or alcohol abuse
- Certain medications
- Congenital heart disease

What to do if someone is having a cardiac arrest (in steps):

1. ***Call 911:*** A heart attack is a medical emergency, do not ignore the signs. The sooner a person can get to a hospital, the better the change of survival
2. ***Begin CPR:*** If the person is unconscious, not breathing, or is unresponsive, call for emergency assistance then immediately begin compressions (100-120 compressions a minute)
3. ***Use an AED:*** If the person is still unconscious and an automated external defibrillator (AED) is available, follow the device instructions and prompts until emergency assistance arrives

CONTINUE COMPRESSIONS AND AED SHOCKS UNTIL PROFESSIONAL HELP ARRIVES

Common Treatments:

Treatments vary between the different conditions, but these are general treatments many of them have:

- Coronary artery bypass surgery
- Defibrillation
- Medicine
- Heart valve repair/replacement
- Pacemaker

Heart Disease Prevention: Healthy Lifestyle

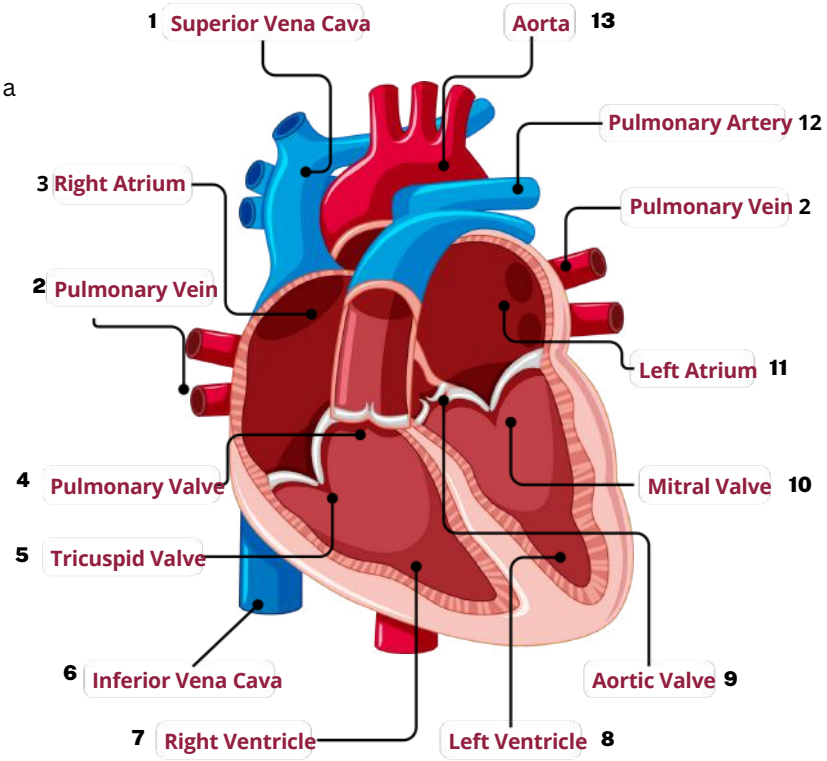
- Regular check-ups
- Medication
- Avoid smoking
- Healthy diet
- Maintaining a healthy weight
- Limit stress factors
- Exercise regularly
- Managing unhealthy cholesterol and sugar levels
- Avoid drug use
- Regular sleep
- Reduce sugar and salt intake

Sources: American Heart Association, CDC, Victor Chang Research Association

THE ANATOMY OF THE HUMAN HEART

Created By: Jules Phipps

The human heart is the life source of the body. It is a fist fist-sized muscle that pumps blood throughout the human body. The heart is the main organ in the circulatory system and has four different chambers: the right atrium (3), the right ventricle (7), the left ventricle (8), and the left atrium (11). These chambers are made of muscle and are hollow. The septum separates the left and right sides of the heart.



Blood carries oxygen, nutrients, and antibodies to the other parts of the human body. The human heart pumps 2,000 gallons of blood a day.

The right atrium (3) receives blood and has the sinus node, which regulates heart rhythm. It collects deoxygenated blood from the body through the superior (1) and inferior (6) vena cava. The blood then flows into the right ventricle (7) through the tricuspid valve (5).

The right atrium is also part of the electrical system of the heart. The electrical system of the heart makes the heart beat at a continuous rhythm. The right atrium has the sinus node in its walls. The sinus node is made up of pacemaker cells that produce electrical impulses to make the heart pump. The tricuspid valve (9) pumps blood into the right ventricle. The right ventricle pumps blood through the pulmonary valve (4) and into the pulmonary arteries (12). The different pulmonary arteries carry blood to the left and right lungs.

Oxygen-rich blood enters the left atrium through the pulmonary veins (2). The pulmonary veins are the only veins in the human body to carry oxygen-rich blood. The left atrium (11) acts as a holding chamber for blood and pumps blood into the left ventricle (8). The blood is pumped from the left atrium and into the left ventricle through the mitral valve (10). The left ventricle contracts and forces oxygenated blood through the aortic valve (9) to be distributed to the entire body. The aorta (13) is the largest artery in the heart that distributes blood to the rest of the body.

The human heart is a complex organ that has many parts and functions. It is important to understand the structure and function of the heart because it is a remarkable organ that keeps us alive.

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THE SILENT SIGNS: HEART DISEASE

CREATED BY:
LUCAS CONLEY

OVERVIEW

There is a wide range of symptoms for cardiovascular disease, ranging from a lingering cough to sporadic vomiting. Many people do not associate these symptoms with heart disease, but these can be considered “silent signs” that your heart is not healthy. It is important for teens and young adults to understand that these symptoms must be taken seriously and not ignored.

DIZZINESS

Those who have a normal, healthy heart are able to stand up from a resting position without feeling dizzy. A heart that is experiencing signs of complications, however, will result in blood pressure lowering when standing up. The reduced blood flow through the body is a sign of heart failure that young people typically ignore because they do not correlate dizziness with the heart.

A LINGERING COUGH

A lingering cough can be related to heart failure. A healthy heart can pump blood efficiently by receiving oxygen-poor blood and sending it to the lungs, where it picks up oxygen and releases carbon dioxide. An unhealthy heart is not able to do this properly, and blood will get backed up in the lungs. This results in a cough that sometimes releases a fluid. If not acted upon fast, airways can eventually become blocked, and a person can undergo cardiac arrest.

THROWING UP

Throwing up is a sign of heart disease that people often do not relate it to. When blood pressure or heartbeats are not regular, it can result in an irregular blood flow through the digestive system and mixed signals to the brain, causing someone to throw up. In some cases, nausea can be a symptom of a future heart attack. Many teens and young adults experience symptoms of nausea when suffering from dysautonomia, a heart condition that causes irregular blood flow through the body.

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MEET A CARDIOLOGIST

A Q&A on the Important Facts and Information

Created By: Dalia Latzman

What is the most common issue that you see in your patients, and why do you think this is?

Within the population of my patients, I experience a lot of issues involving hypertension, or high blood pressure, which can lead to a series of issues such as heart attacks, strokes, and kidney failure. A large portion of hypertension seen in patients is caused partially due to lifestyle, such as inactivity, high sodium intake, and obesity.

What is the easiest lifestyle change that you reccomend to your patients?

Taking time to partake in aerobic exercise, such as an afternoon walk outdoors, is beneficial in causing vasodilation, which leads to increased blood flow to the skeletal muscle, and can have a long-term effect on reducing blood pressure and cholesterol

DR. BRYAN R. LATZMAN

Montefiore M.D. + Cardiologist

Montefiore Einstein

What drew you to pursue cardiology specifically - why do you believe that it is an important field?

I believe that cardiology is a field in which one can make an impact to improve the health of others. With cardiovascular health, there are many factors that can help to prevent issues through the informing others. As well as the benefits of sharing information to others, there are also many helpful and innovative procedures and medicines.

What is one way that others can be informed about preventative work against cardiovascular disease?

Asking your physician during yearly check-ups for information is a good way to educate yourself. Resources such as pamphlets are typically available, and it can be very beneficial to conduct research, while informing yourself about possible prevention against cardiovascular disease.

What do you think is an important fact to have an understanding of regarding cardiovascular health and disease?

An important aspect of cardiovascular health is to understand the link between cardiac risk factors such as high blood pressure, diabetes, a sedentary lifestyle, smoking, and high cholesterol, to the development of heart disease and stroke. Knowing what is causing these problems is extremely important to keep in mind when going about daily life.

A Day In The Life of a Cardiologist Beyond The Job

Created By: Anisha Bobra

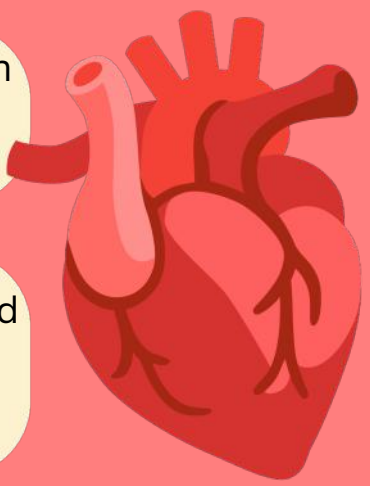
Heart health goes beyond changing a habit or two: it's a **lifestyle**. Cardiologists adapt their days around the practices they preach to their patients. Here is a working day inspired by the life of cardiologist **Veena Gupta**, who has been practicing medicine for over 50 years.

6:00AM Every morning, Dr. Gupta goes on a **20 minute walk**. This promotes cardiovascular health and improves mental wellbeing.

8:00AM Dr. Gupta makes sure that she eats a **balanced breakfast** containing proteins, carbohydrates, and healthy fats. Dr. Gupta's favorite breakfast is hummus and avocado on whole wheat toast.

12:00PM Throughout her day, Dr. Gupta makes sure to drink **64 ounces of water**, around 8 cups, which supports bodily functions. Her lunch contains at least 3 food groups, and she keeps moving around during the work day.

6:00PM Dr. Gupta eats a balanced dinner with her family. In **moderation**, she finds a way to eat what she is craving without compromising her health.



10:00PM After a tiring day, Dr. Gupta can rest, aiming for around **8 hours** of sleep daily. With a balanced lifestyle, Dr. Gupta lives a heart-healthy, worry-free life.

Thank you *Dr. Veena Gupta,* owner of *Concourse Cardiology Associates,* for your dedication. Your contributions to the medical world are truly inspiring.

Shell Yeah! How Seafood Supports a Stronger Heart

Created By: Audrey Li

As temperatures rise and cookouts kick off, there's no better season to fire up the grill (or shuck a few oysters!) and give your heart a little extra love. Seafood isn't just a summer staple; it's a **smart move for your cardiovascular health**. Whether it's salmon or shellfish, fish tacos or steamed mussels, the science is clear: the sea has some serious heart-healthy secrets.

The Power of Fish: Omega-3s and Lower Risk

Fatty fish like salmon, mackerel, sardines, and tuna are richin omega-3 fatty acids, which help reduce inflammation in blood vessels, lower triglycerides, regulate blood pressure, and prevent arrhythmias (irregular heartbeats). Research shows that eating fish twice a week can cut your risk of attack, stroke, and even heart failure. And it's not just omega-3s doing the work: fish is also low in saturated fat and packed with lean protein, vitamin D, and selenium (Mayo Clinic Staff, 2023).

Pro Tip

You don't have to eat fancy fillets. Canned salmon or tuna works great in salads, wraps, and pasta. Just aim for 2-3 servings a week (NOAA Fisheries, 2021).

Bivalves = Tiny Shells, Big Benefits

Bivalves like oysters, mussels, and clams are heart-healthy and eco-friendly. They're rich in omega-3s, taurine, B12, iron, and other key nutrients, plus low in saturated fat and high in protein. Best of all, they're sustainable: bivalves filter water naturally and require no feed or chemicals, making them good for your heart and the planet (Corliss, 2023).

Seafood Safety: What to Know

Moderation is key!

- Large fish like shark and swordfish can carry more mercury, but salmon, sardines, shrimp, and bivalves are low-mercury and safe to eat 2-3 times per week (Harvard Health Publishing, 2022).

Worried about cholesterol?

- Shellfish like shrimp and crab are high in cholesterol, but low in saturated fat. Current research shows they're fine in moderation—even for heart health (Corliss, 2025).

Seafood is a simple, delicious way to support your heart, especially in the summer when it's fresh, fast, and easy to cook. Whether it's grilled salmon or oysters on the half shell, adding just two servings a week can help protect your heart, reduce inflammation, and promote overall well-being.

Easy Summer Seafood Swaps

- Grill fish tacos instead of burgers
- Use shrimp or salmon on pizza instead of sausage
- Make a tuna or salmon wrap with canned fish
- Top salads with leftover grilled seafood for lunch the next day

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HEART MEDICINE AROUND THE WORLD

Created By: Maria Lopez

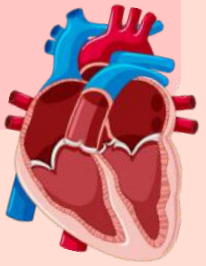
Cardiovascular diseases (CVDs) are the leading cause of death globally, responsible for approximately 18 million deaths each year (Mocumbi, 2024). While heart disease affects populations in every country, access to effective medication and treatment varies widely. From modern pharmaceuticals in high-income nations to traditional herbal remedies in developing regions, the global landscape of heart medicine reflects disparities in healthcare systems, economic status, and cultural practices. This article will explore commonly used heart medications, the challenges of access in low- and middle-income countries (LMICs), and innovations shaping the future of cardiovascular care.

Common Types of Heart Medications

The treatment of heart conditions often relies on a variety of pharmaceutical drugs designed to manage symptoms, improve heart function, and reduce the risk of serious events such as heart attacks or strokes. These include (Types of Heart, 2025):

- Anticoagulants (e.g., warfarin) prevent blood clots from forming or growing and are commonly prescribed to reduce stroke and heart attack risk.
- Antiplatelet agents like aspirin inhibit blood platelets from clumping, helping prevent clot-related conditions.
- ACE inhibitors and ARBs work by relaxing and widening blood vessels, easing the heart's workload and lowering blood pressure.
- Beta-blockers slow the heart rate and reduce blood pressure, commonly used after heart attacks or for chest pain (angina).
- Calcium channel blockers help decrease the heart's pumping strength and relax blood vessels.
- Cholesterol-lowering medications (statins) reduce LDL cholesterol levels, which are linked to arterial plaque buildup.
- Diuretics help the body eliminate excess fluid and sodium, reducing swelling and easing strain on the heart.

These medicines form the foundation of cardiovascular treatment across the world, though their availability and use vary by region.



Challenges of CVDs in Low- and Middle-Income Countries

While high-income countries generally maintain stable access to essential heart medications, LMICs face significant barriers. Approximately 80% of cardiovascular deaths occur in LMICs, yet many people in these regions struggle to access proper treatment (Mocumbi, 2024).

Challenges include (Mocumbi, 2024):

1. **Poor health infrastructure** and lack of specialized care.
2. **High medication costs** and a limited availability, particularly in public health facilities.
3. **Geographic barriers** that limit access to urban hospitals or pharmacies.
4. **Low health literacy**, making early detection and prevention more difficult.

Traditional Approaches to Heart Health

In addition to pharmaceutical options, traditional medicine plays a significant role in heart care around the world, especially in countries like China and India.

- **Traditional Chinese Medicine (TCM)** emphasizes the balance of body systems. Remedies like ginkgo biloba, danshen, and hawthorn are believed to support heart function and circulation (Davidson, 2023).
- **Ayurveda**, India's traditional system of medicine, promotes heart health by balancing bodily energies or doshas. Common herbs include arjuna (for strengthening the heart), ashwagandha (for reducing stress), and ginger (for improving circulation) (PD, 2005, pp. 420-425).

These practices are culturally important and still widely used, often alongside modern medicine.

Innovations and the Future of Heart Medicine

As heart disease continues to rise—projected to affect 15% of the U.S. population by 2050—research and innovation are becoming increasingly vital. Two key developments include (Mcauley, 2025):

- **GLP-1 Receptor Agonists** (such as semaglutide and tirzepatide): Originally developed for diabetes and weight loss, these drugs now show significant cardiovascular benefits, including reduced heart failure risk and improved cholesterol, blood pressure, and inflammation markers.

- **Artificial Intelligence (AI)**: AI is transforming cardiology by enabling earlier diagnosis through image analysis and pattern detection. AI systems also support collaborative care models, improving patient outcomes through personalized treatment.

These advancements signal a shift toward more precise and accessible heart care.

Heart medicine around the world reflects the broader challenges of global health equity. While some countries enjoy advanced treatments and cutting-edge technologies, others struggle with basic access. Addressing these disparities requires coordinated efforts in public health policy, international aid, and innovation. As heart disease remains the leading cause of death, expanding access to effective medications and embracing emerging technologies will be essential to improving cardiovascular outcomes worldwide.

***Sources**: Cheng et al. (2024); Davidson (2023); Husain et al. (2020); McAuley (2025); Mocumbi (2024); Patwardhan & Sharma (2015); PD (2005); American Heart Association (2025); Johns Hopkins (n.d.); Zampieri et al. (2023)*

Heart-Healthy Stuffed Sweet Potato

A perfect blend of sweet and crunchy; this dietitian-approved recipe is perfect for an easy, healthy breakfast or snack.

Created By: Kaoruko Daito

1 servings

10 minute prep time

INGREDIENTS

Medium-sized sweet potato
1/2 cup greek yogurt
Pinch of chia seeds
1 tsp ground flax seeds
1 tbsp of sliced almonds
Honey

DIRECTIONS

1. Preheat oven to 425 degrees Fahrenheit.
2. Wrap your medium sweet potato in aluminum foil. **You can drizzle some olive oil onto the potatoes before for an optimal savory touch.
3. Bake for about 45-50 minutes, depending on how large your sweet potato is.
4. Once baked, carefully remove the aluminum foil and place the potato onto your platter.
5. Cut the sweet potato horizontally and lay it on a plate, facing upwards.
6. Add ½ cup of greek yogurt; you can adjust to your liking.
7. Sprinkle some chia seeds.
8. Sprinkle a teaspoons of ground flax seeds.
9. Top with some sliced and crushed almonds. Chopped walnuts are a perfect alternative as well.
10. Drizzle some honey onto the entirety of the meal, and you're done!

Why This Recipe?

LOW GLYCEMIC INDEX
Despite most carbohydrate-rich foods having a rather high glycemic index, sweet potatoes are lower in number. From this, your blood sugar levels will not spike, making it a fitting breakfast for those with diabetes (New York Times).

LOW IN SODIUM
The foods incorporated in this recipe contain a low percentage of sodium. This lowers the chance of an increase in blood pressure (Harvard T.H. Chan). High blood pressure is one of the primary causes of heart failure as the heart would be overworked, resulting in an inefficiency in the delivery of oxygen and other vital nutrients; therefore, it is recommended to lower your daily consumption of sodium (AHA).

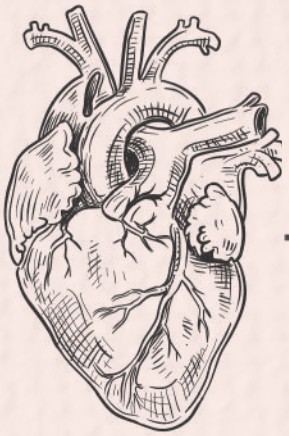
HIGH IN FIBER
Sweet potatoes, chia seeds, and flax seeds include a significant amount of fiber (Healthline). Fiber can prevent constipation by adding weight and size to your stool (Mayo Clinic). Additionally, it can lower the risk of heart disease by suppressing cholesterol levels that can promote plaque build up (Houston Methodist). Moreover, fiber can "boost the body's production of GLP-1" which "helps you feel full for longer"; it can be beneficial for those trying to lose or maintain weight (New York Times).

HIGH IN OMEGA-3 FATTY ACIDS
Almonds, flax seeds, and chia seeds are rich in healthy fats (Healthline). The fatty acids are known to keep your blood vessels smooth, lowering the risk for plaque build-up (SEARHC).

HIGH IN PROTEIN
Besides containing a high percentage of calcium, greek yogurt is high in protein without the unhealthy fats that a non-greek yogurt may contain. Proteins can "help maintain muscle mass and promote muscle growth," and thus it is crucial to ingest the recommended amount of protein (Healthline). Additionally, proteins are demonstrated to trigger faster metabolism, making it a vital nutrient for weight loss (Healthline).

Sources: New York Times, Harvard T.H. Chan, AHA, Healthline, Mayo Clinic, Houston Methodist, SEARHC

Created By: Bliss Tilley



Fitness Routines

Physical Practices to Promote Cardiovascular Wellness

Cardio

Cardiovascular exercise is any physical activity that gets your blood pumping and your breathing heavy, and as the name suggests, is the most directly beneficial form of workout for heart health, as it strengthens the heart muscle. Running, jogging, cycling, jumping, swimming, walking, and dancing are excellent ways to get your heart rate up, burn calories, build endurance, and overall improve cardiovascular health. Prolonged cardio workouts can be quite exhausting since the heart is working diligently to pump blood and the lungs are striving to deliver oxygen to the muscles, but the implementation of this brisk movement into everyday routines, even if it's just 5 minutes of jumping rope, pays off over time. The heart adapts to the increased demand for blood flow from cardio exercise and learns how to work more efficiently, thus decreasing blood pressure and heart rate while the body is at rest. As an important note, when doing cardio exercise, it is crucial to drink enough water! A hydrated body allows the heart to pump blood through the veins easily, so keeping a water bottle nearby while on the treadmill or on a bike ride means that your cardiovascular system does not have to toil tirelessly.

Strength Training

Did you know that strength training can help lower blood pressure and improve blood circulation? When muscles are made stronger from lifting weights or doing body weight exercises like push-ups and squats, everyday tasks are made easier, taking a heavy weight off the cardiovascular system, literally and figuratively. When the body builds muscle mass, more blood vessels are required to supply those glorious gains with oxygen and the nutrients that they need, thus resulting in more areas where blood can freely flow, so that the heart does not have to work

as hard to keep blood pumping. Practicing strength training for just 30 minutes per week has been proven to improve issues such as high blood pressure and poor circulation, which, if left untreated, can lead to the risk of heart disease. Grab your weights and keep that vital vascular organ healthy!

Flexibility

Despite being less intense than a heart-pounding treadmill run or a calisthenics chest pump, stretching is absolutely essential to any exercise regimen, as it keeps the muscles strong and flexible. In relation to the heart, stretching daily can reduce stiffness of the arteries for better blood flow and the reduced risk of heart attacks and strokes. Hamstring stretches, cat-cow stretches, and lunges are among many simple movements that increase flexibility and posture as well as improve blood flow for a healthy heart. Besides standard stretching, practicing yoga is a great way to relax the body and mind. When stress takes over, the rest of the body, stress on the heart to work harder also sets in through increased blood pressure and an elevated heart rate. However, by doing some yoga poses paired with steady, deep breathing, the nervous system will calm down, the heartbeat has the chance to regulate, and blood pressure may even decrease.

The Ideal Routine: Combining All Three

So which of the three physical practices is best for a healthy heart? A harmonious combination of all three makes for the perfect routine for cardiovascular wellness. According to the Mayo Clinic, at least 150 minutes of cardio per week combined with 30-60 minutes of strength training per week is adequate for heart health. However, it is important to remember in order to gain all of the hearty benefits of cardio and lifting, a daily stretching routine to prepare the muscles for the workout and reduce the risk of an injury should be implemented as well. Happy exercising, and remember how hard your heart works to keep you going, so show it some love in return!

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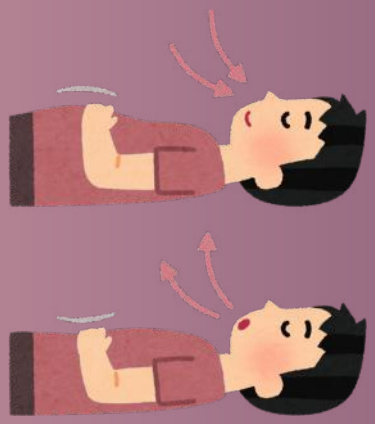
Mindful Hearts, Strong Starts

Created By: Alina Yang

An adolescent's nervous system is still developing, and chronic stress can hardwire patterns that keep the sympathetic "accelerator" stuck on high well into adulthood. Just a few minutes of mindfulness each day can activate the parasympathetic "brakes," lowering blood pressure and building heart resilience. Below are five quick, youth-friendly practices to incorporate into your day.

1. Diaphragmatic Breathing

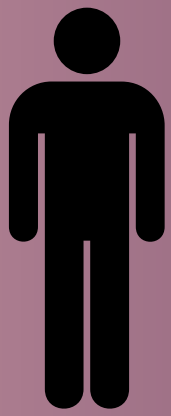


Invite students to sit tall or lie on their backs, one palm on the chest and the other on the belly. They breathe in through the nose for four slow counts, feeling the lower hand rise like a modest balloon, while the upper hand stays almost still. A brief one-count pause follows, then a six-count exhale through pursed lips, letting the belly sink as if the balloon deflates. Practicing five minutes after waking and again before homework gradually lowers resting heart rate, improves oxygen delivery, and pairs calm breathing with a calmer pulse—an internal demo that the diaphragm is a built-in brake pedal for the cardiovascular engine.

2. Heart Rate Variability Feedback

For tech-savvy teens, mindfulness becomes a gameboard. Using a fingertip pulse sensor, smartwatch, or phone camera app that translates beat-to-beat changes into a simple "coherence" meter, they breathe at roughly six cycles per minute (five seconds in, five seconds out). When the meter rises, players know their sympathetic and parasympathetic systems have fallen into healthy synchrony; if the bar dips, they lengthen the exhale, picture a soothing scene, or repeat an anchor word like "steady." Ten-minute sessions after sports practice or before tests both sharpen focus and strengthen vagal tone.

3. Full-Body Scan

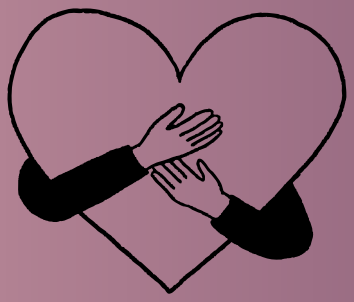


At midday recess or lights-out, students lie comfortably, close their eyes, and imagine a warm flashlight traveling from toes to crown. They pause at each region—calves, knees, thighs—labeling what they feel ("tingly," "heavy," "nothing at all") without judgment, then release that area before moving on. If thoughts drift, they silently say "back" and return to the last body part. A ten-minute scan quiets racing minds, slows respiration, and primes the cardiovascular system for restorative sleep, during which nighttime blood pressure naturally dips and the heart's muscle fibers repair themselves.

4. Youth Sun-Salutation Flow

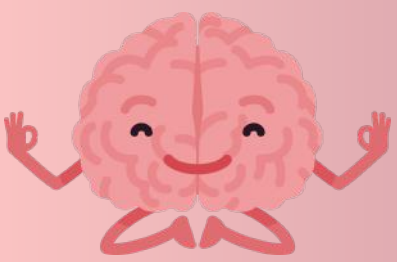
A scaled-down Sun Salutation offers movement-based mindfulness and light cardio in one. Standing at the front of a mat, students inhale, sweeping arms skyward; exhale into a forward fold; inhale to a half-lift; exhale to a plank; lower gently to the floor; inhale into a cobra; exhale, lifting hips into downward dog for three slow breaths; then walk forward to repeat. Five rounds last about ten minutes, engaging major muscle groups while synchronizing each pose with deliberate inhales and exhales. Because the flow keeps heart rate moderately elevated but rhythmically steady, it trains cardiac efficiency while teaching breath-body coordination—a portable stress-relief dance they can perform at any time.

5. Loving-Kindness Meditation

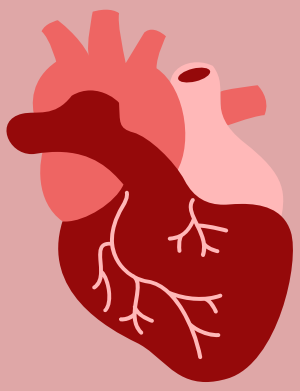


Seated comfortably, one hand on the heart, students close their eyes and silently repeat phrases: “May I be safe. May my heart be strong. May my mind be at ease.” After three or four breaths, they extend the wish to a friend, then to a neutral classmate, and finally to “all beings.” Rather than chasing concentration, they focus on generating a felt sense of warmth in the chest—sometimes described as a gentle glow or soft pulsing. That emotional warmth triggers a parasympathetic surge, subtly slowing heart rate and cultivating an attitude of social support shown to buffer the cardiovascular system from future stress.

None of these mini-rituals requires a prescription pad—just a timer, a quiet cue, and some thoughtful framing. Stack diaphragmatic breaths in the morning, a heart rate variability feedback game before homework, and a body-scan at lights-out, and a teenager can collect 20-30 minutes of nervous-system recess without adding screen time. Build the habit early, and the heart learns a lesson that lasts far beyond any gym class: how to soften its rhythm when life speeds up.



Sources:
Cleveland Clinic, University of Michigan, Healthline, Calm



Advances in Cardiovascular Disease Research

Created By: Maeve Gleba

Stem Cells

Stem cells are cells with the potential to differentiate into many different types of cells. This ability makes them perfect for repairing tissues. There are embryonic stem cells and tissue-specific stem cells. Many different types of stem cells have been used in regenerative cardiac research. They are sometimes taken from the patient's own heart or from donors (with donor marrow, there is a potential for rejection). The stem cells are usually taken from bone marrow and then injected into the heart. These stem cells then help the damaged heart tissue to regenerate. There are some risks to these therapies, including immune system rejection and communication issues that can cause arrhythmias (dangerous, irregular heart rhythms). Though this field of research is new, it is showing promising results. Some studies have seen little to no improvement, while others have shown drastic improvement. Stem cell therapy may be standard treatment for heart damage within the next decade.

Genomics

Genomics is the study of an organism's entire genome (complete set of genetic information). We are able to sequence this DNA and discover information about the individual's genetic makeup. This allows us to discover what genes are related to certain diseases. A major objective of genomics is to discover what DNA regions predispose an individual to or directly cause cardiovascular disease (CVD). The more we know about genomics, the more we can understand CVD. Knowing the genetic mutations that lead to CVD allows for more precise understanding, targeted treatment, and early diagnosis. One issue we run into is the ability to identify genetic factors before we are able to discover treatments for these diseases. This leads to the argument that diseases should not be genetically tested for if they are yet to have treatments. One major issue with making gene sequencing widely available is its cost. If improvements in genomics technology continue to be made, gene sequencing could become a routine practice within the next 5 years.

Precision Medicine

Precision medicine is a personalized approach to healthcare that considers all the different factors that influence a patient's health when preventing, diagnosing, and treating diseases. Heart disease is the leading cause of death, both in the United States and worldwide. The presence of CVD has only been increasing, which makes it apparent that there needs to be a different approach. Treating CVD typically has a very standard blanket approach. Heart disease is a complex issue that greatly varies from person to person. This is why a more personalized approach could be key to preventing and treating CVD. People with the same heart problems can have different underlying mechanisms and different reactions to treatments. Using precision medicine in cardiovascular care can be beneficial before a patient even has a heart problem. The use of precision medicine takes into account the different genetic and environmental issues that influence risk for CVD. This allows for better prevention. Knowing the risk factors often leads to earlier diagnoses. The use of precision medicine in treatment allows for a better-tailored plan that meets the needs of each individual patient. This can help prevent over or under treating disease and decrease health disparities. The major barriers to mass implementing precision medicine in CVD treatment is cost, resources, and technology.

Circadian Rhythm

In simple terms, the circadian rhythm is like our body's internal clock. It is a 24-hour cycle that regulates many bodily processes. In recent years, research has found just how impactful circadian rhythms and their disturbances are in cardiovascular health. Depending on where you are in your circadian rhythm, you have differing heart function, injury response, and cardiac risks. Taking into account the effect that the circadian rhythm has on the cardiovascular system could help to better prevent, understand, and treat CVD. Knowing what times the body is more at risk for cardiac issues and when the body is better at processing medicine could play a crucial part in advancing the treatment of CVD. A better understanding of the relationship between the circadian rhythm and the cardiovascular system could even lead to new ways of treating CVD.

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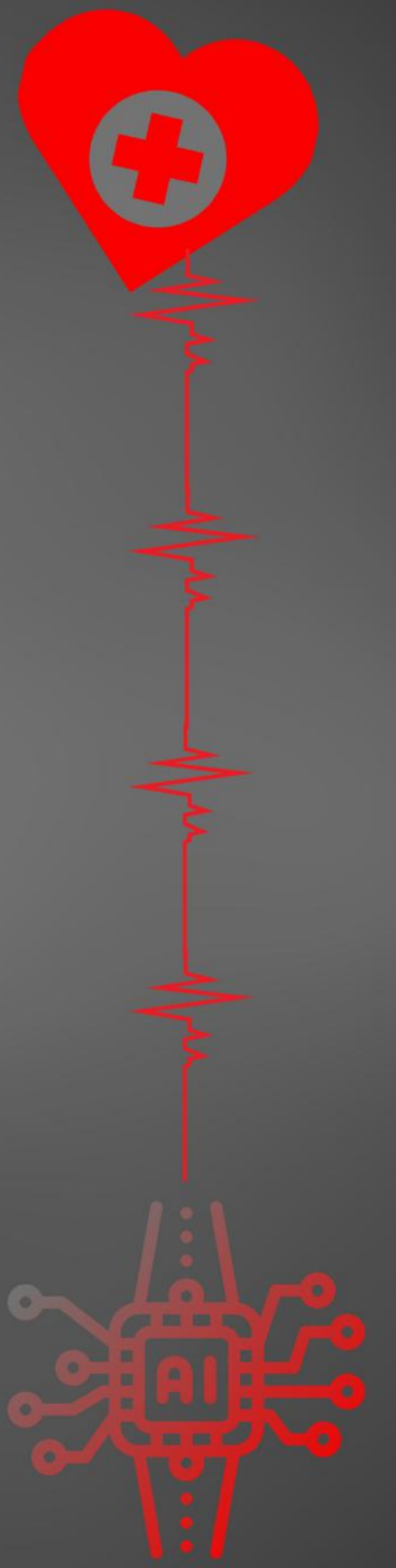
The Healthcare Revolution:

HOW AI IS LEARNING TO SAVE LIVES

Created By: Brian Lemon



In late 2023, writers from *The Economist* came together to deliberate over their word of the year. Though there were certainly many options, they eventually decided on "ChatGPT" as their choice, only because they considered "AI" to be two words and "generative" to be too niche. Frankly, this selection should be unsurprising and rather expected considering how artificial intelligence (AI) has consumed our society. It seems as if AI technologies have been integrated into every aspect of our daily lives, spanning everything from self-driving cars to Snapchat. The healthcare industry, particularly in the fields of cardiology and heart health, is the latest sector to be impacted by the AI revolution. This article seeks to inform you of groundbreaking research regarding the emergence of a brand-new AI tool that helps prevent life-threatening cardiovascular conditions, potentially saving the lives of millions of people globally.

Research published in late 2024 outlines a cutting-edge AI algorithm that can enhance electrocardiogram (ECG) analysis, helping doctors detect, diagnose, and prevent otherwise fatal abnormalities. ECGs measure the electrical activity of the heart to detect discrepancies in rhythm, rate, or structure. Using data from over 1.16 million ECG test results from nearly 200,000 patients, Sau et al. (n. d.) programmed a deep learning model called AIRE (AI-ECG Risk Estimator) to detect subtle aberrations in the readings. The algorithm is remarkably proficient at identifying these irregularities as well. Testing showed that AIRE was able to correctly predict the future risk of heart failure 79% of the time, future heart rhythm problems in 76% of cases, and future atherosclerotic cardiovascular disease (a condition that often precedes and causes heart attacks) in 70% of cases.

Such high accuracy indicates the legitimacy of the AIRE technology and its potential applications for enhancing ECG analysis in hospitals around the world. As lead researcher Dr. Arunashis Sau puts it, "The AI model detects much more subtle detail, so it can 'spot' problems in ECGs that would appear normal to us, and potentially long before the disease develops fully" (AI Model Can Predict Health Risks, Including Early Death, From ECGs, 2024). Essentially, the model is not intended to replace the work that cardiologists already do; rather, it is designed to augment the doctors' work and decrease error rates through superhuman detection algorithms. Not only will AIRE have a positive impact on how patients are treated, but it will also have a positive impact on how many people are treated, as it will allow for a more efficient allocation of resources through faster and more accurate diagnoses. AIRE is set to enter clinical trials in hospitals across the United Kingdom over the next few months. These tests will "focus on evaluating the benefits of implementing the model with real patients and will start by mid-2025" (AI Model Can Predict Health Risks, Including Early Death, From ECGs, 2024). Though still in its early stages, AIRE appears to be one of the most promising ways researchers are implementing AI into the medical sector, exhibiting the potential to help millions of people globally.

While it is true that AI has taken over the world, its benefits are clearly reflected through advancements in the medical industry. AIRE is poised to be the first of many developments in the advancement of a biomedical sector that will captivate the world and save the lives of millions in the coming years. Although the current model only passes with a D- at best, the fact that we have created a computer program that can detect these abnormalities at all is an achievement in and of itself. And, who knows, maybe in a few years writers from *The Economist* will choose "AIRE" as their word of the year to represent the beginning of a new age of medicine powered by artificial intelligence.

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MYTHBUSTERS

Created By: Leia Patel

When it comes to heart health, misconceptions are everywhere. Cardiovascular disease is killing more and more people in the U.S. each year. It's time to separate fact from fiction and bust some myths!

"Heart disease is only for older people"

Plaque buildup in the arteries can begin as early as childhood or adolescence. Nearly half of U.S. adults aged 20 and older have some form of cardiovascular disease, and many of them are not seniors! As risk factors like obesity and Type 2 Diabetes become more common at younger ages, heart problems are increasingly affecting younger populations.

"I will have chest pain if I am having a heart attack"

While chest pain is a common symptom, heart attacks can also show up with more subtle warning signs, like shortness of breath, nausea, dizziness, or discomfort in the arms, jaw, neck, or back. These symptoms are often mistaken for less serious issues, such as heartburn or a strained chest muscle.

"It is normal to have higher blood pressure as you get older"

While blood pressure often rises with age, that does not mean it is safe. Aging causes arteries to stiffen, which forces the heart the work harder, leading to long-term damage, including increased risk of heart attack. High blood pressure often has no symptoms, so it can quickly harm your body without warning. Catch it early through regular blood pressure checks!

Sources:
American Heart Association, Harvard Medical School, Mayo Clinic

Heartbeats: A CPR Mixtape

Created By: Chelsea Wilkerson

Cardiopulmonary resuscitation (CPR) is an emergency life-saving procedure. The purpose is to buy time for emergency services to arrive and give further treatment. The CPR ratios are 30 compressions to two breaths for adults and 15 to two breaths for children. Utilizing music keeps the compression rate correct, reduces stress, and can boost your confidence in the moment. Feel free to use the songs for accurate compressions!

To effectively use music for CPR training practice with the music for retention. Associating CPR compression with specific beats can help your mind recall the correct tune in a real situation. CPR training allows individuals the skills and confidence to potentially save lives. CPR can double or even triple the chances of survival for someone experiencing cardiac arrest. CPR certification can help prevent brain damage and death by keeping oxygenated blood moving through the body.

- “Stayin’ Alive” - Bee Gees
- “Suddenly I See” - KT Tunstall
- “The Man” - Taylor Swift
- “Dancing Queen” - Abba
- “Breathin” - Ariana Grande
- “Dancing Through Life” - *Wicked* (the musical)
- “You’re So Vain” - Carly Simon
- “Smooth Operator” - Sade
- “Espresso” - Sabrina Carpenter
- “Gimme! Gimme! Gimme!” (A Man after Midnight) - Abba
- “Murder on the Dance Floor” - Sophie Ellis-Bextor
- “I Wanna Dance with Somebody” - Whitney Houston
- “Stick Season” - Noah Kahan
- “Yes, And?” - Ariana Grande
- “Not Like Us”- Kendrick Lamar
- “Somebody to Love” - Queen

About Guardians of the Heart

Guardians of the Heart is a 501(c)(3) nonprofit organization dedicated to the promotion of cardiovascular health and the prevention of heart disease among youth. Our mission is to ensure that young people from all backgrounds understand the lifelong impact of heart disease and the critical importance of early prevention through lifestyle medicine, heart-healthy habits, and CPR education.

We engage youth through a variety of interactive, educational, and community-based initiatives, including expert-led panels, library workshops, community blood pressure screenings, school and neighborhood health fairs, scavenger hunts, CPR demonstrations, trivia contests, heart-focused book read-alouds, and hands-on arts & crafts activities that creatively reinforce wellness messages.

Because the dynamic nature of adolescence solidifies it as a critical time to introduce and reinforce healthy habits that have the potential to last a lifetime, addressing these habits in youth is more effective than trying to reverse them in adulthood, which would be counterproductive. Not only is this approach proactive rather than reactive, but it also has the potential to "prevent" so that we no longer need to "treat," thereby establishing more resilient populations and protecting the hearts of future generations to come.

Get Involved

Interested in learning more?

Visit www.guardiansoftheheart.net or email us at contact@guardiansoftheheart.net to explore volunteer opportunities, partnership options, or other ways to support our mission.

Join us to educate, advocate, and empower.

Heartline, Vol. 1, Issue 1, Summer 2025.

HEARTLINE

Vol. 1, Issue 1- July 2025

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