



CAREERS IN CARDIOLOGY (MIDDLE SCHOOL)



BACKGROUND:

In this lesson, students explore different roles in healthcare and participate in activities that help them understand different career paths. Students will explore their skills and opportunities to grow to reach their future career goals.

ACTIVITIES:

1. Careers in Healthcare
2. Careers in Cardiology Matching Game
3. Inventory of Strengths and Skills
4. Career Exploration
5. What is an Electrocardiogram?

LEARNING OBJECTIVES:

Students will be able to:

- Describe the different careers in the healthcare system.
- Explore the types of training and education required for healthcare careers.
- Discover their own skills and interests and how they might apply as a healthcare professional.

INTRODUCTION:

We have learned about how our hearts work and way to keep it healthy in previous lessons. Now we are going to learn about careers that connect to heart health. Maybe one of the careers we focus on in this lesson will spark an interest in a future career path.

We are going to begin by talking about healthcare. Do you know what the healthcare system is or the components of it? Allow students time to share their ideas of healthcare.

Yes, those are all great examples that make up the healthcare system. The purpose of healthcare is to help improve health through services that either prevent, diagnose, treat, or cure disease, illness, injury or other impairments. The system of healthcare is a combination of people or organizations that help this care be possible for people. There are many careers involved in the system, so we are going to dig a little deeper into what some of these are, especially those connected to the prevention and treatment of heart disease.



SUPPLIES NEEDED FOR ACTIVITIES:

- Healthcare Careers Cards
- Career Exploration Worksheet
- Mapping Your Strengths
- ECG Worksheet

ACTIVITY 1: CAREERS IN HEALTHCARE

In this activity, the class will do a brainstorm. You may want to determine how they will capture their brainstorm. Will you have someone list it on the board, in small groups, just verbally, etc.

- **DO:** As a class, let's brainstorm a list of careers in healthcare. *Provide time for the class to complete this brainstorm either as a large group or in small breakouts. [If you do small breakouts, you'll need time to share out their ideas to the whole group.]*
Next, the class will discuss what cardiology is and identify careers in cardiology that may have been mentioned or add more to the list.
- **Cardiology** — a branch of medicine that specializes in diagnosing and treating diseases of the heart, blood vessels, and circulatory systems. These diseases include coronary artery disease, heart rhythm problems, and heart failure. Below are examples of careers in cardiology.
 - Cardiac Rehab
 - Cardiologist
 - Cath Lab Tech
 - Dietitian
 - Echo Tech
 - ECG Tech
 - Laboratory Technician
 - Medical Assistant
 - Nurse
 - Nurse Practitioner
 - Pharmacist
 - Physician Assistant
 - Researcher
- **REFLECT:** Are you familiar with any on the list? Any that you haven't heard of before? Anybody know someone in one of these careers? Allow time for a few students to share. That's okay if some of these careers are new to you. In the next activity you'll get the chance to learn more about each role through a matching game.

ACTIVITY 2: CAREERS IN CARDIOLOGY MATCHING GAME

This game can be played by the whole class or small group of students. There are 24 cards, each with a different career in the healthcare system or a description of a role. Assign a student or group of students to each card. There will be a total of 12 matches.

Note: this is not a complete list. You may add to the list of roles after students research more and learn about other roles.

- **DO:** Allow students a couple minutes to review their cards and then have them move around to find their match - healthcare role to description of the role. After everyone has a match have each group read their role and description and as a class determine if it's a match.
- **REFLECT:** Did you learn about a career you didn't know existed? What is a career that really sparked your interest that you may want to learn more about?

- **APPLY:** Anyone interested in a particular cardiology career based on what we just learned? There are many options for careers in healthcare. Keep in mind that even if your passion may not be one of the cardiology focused careers, there are many other jobs and skill sets that are important to the healthcare setting. The next activity will help us map our skills to potential careers.

ACTIVITY 3: INVENTORY OF STRENGTHS AND SKILLS

- **DO:** Have students complete the Mapping Your Skills handout. Have them report back what they may have learned about themselves.
- **REFLECT:** Next as a class, brainstorm skills one may need in health care. Below are some examples:
 - Empathy: you can understand patients and the different situations they may be facing.
 - Communication: ability to speak with patients and their families to relay medical recommendations, self-management, and preventive health behaviors.
 - Teamwork: health care teams involve many people working toward patient care.
 - Work ethic: professionalism, punctuality, overall attitude, and behavior
 - Time management: important to know how to prioritize and triage pressing matters

ACTIVITY 4: CAREER EXPLORATION

- **DO:** Now that students have a better idea of possible careers and the roles they play related to heart health, have students select a healthcare career that may interest them from the list and using their computer/laptop/tablet conduct research to further explore the career opportunity using the Career Exploration worksheet that includes:
 - Name of career:
 - Describe this career in 1-2 sentences.
 - What some skills required for this career?
 - What education and training is needed?
 - What is the average salary?
 - What are things I could do now to build skills for a career like this?
- **REFLECT:** Have students reflect on the career they researched and share with the group why they picked this career to learn about and a key takeaway from what information they discovered about this career. Did anyone find a career they want to consider further?
- **APPLY:** You may want to further explore these career paths or look into what education and training programs are available. What steps could you take as you move into high school to prepare yourself for a potential career?
- **NOTE:** If you have time or want to create a homework assignment out of this lesson, consider having each youth create a small poster about the career they want to research. These could be hung in hallway for all students to look at and review. A follow up reflection assignment could be to ask each student to submit a reflection of 2 other careers they learned about from their peers' posters and highlight key takeaways of other careers
- **EXTENSION:** Invite a healthcare worker as a guest speaker to share their career path, what their typical workday includes, and suggestions on skills to gain for a career in healthcare.

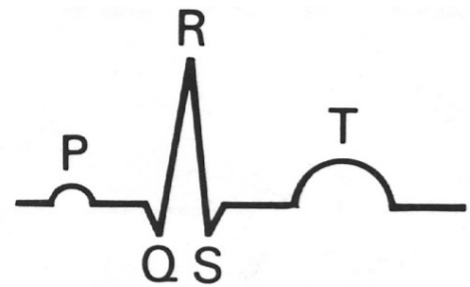
ACTIVITY 5: WHAT IS AN ELECTROCARDIOGRAM?

An electrocardiogram (ECG/EKG) is a test that measures the heart's electrical activity. This can help physicians tell how the heart is working and identify any problems. The ECG can help show the rate and regularity of heartbeats, the size and position of the heart's chambers and where there is any damage.

An ECG is conducted by an ECG Technician by placing skin electrodes (small metal tabs) in a standard pattern on the shoulders, chest, wrists, and ankles. The patient may be laying down and rest or exercising as part of a stress test. Here is a short video providing an overview of getting an ECG: <https://kidshealth.org/en/kids/video-ekg.html>.

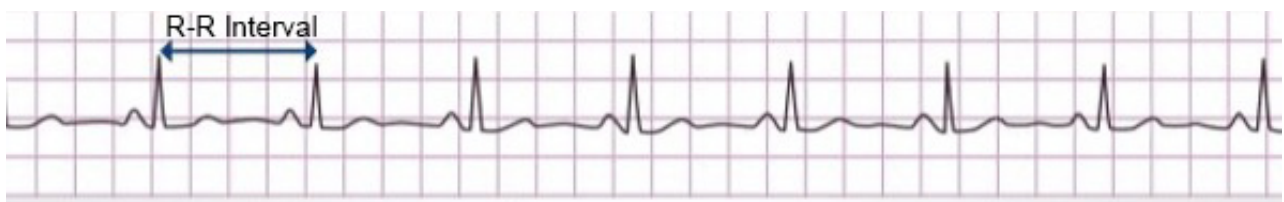
The information is interpreted by a machine and drawn as a graph that shows multiple waves, which reflect the activity of the heart and are read. Normal ECG tracings consists of waveform components that indicate electrical events during on heartbeat. These waveforms are labeled P, Q, R, S, and T.

- P wave: first wave seen in the normal cardiac cycle
- Q wave: first negative following the P wave
- R wave: any positive following the P wave
- S wave: first negative after the R wave



The paper used to record EKG tracings is grid like in nature and has specific markings utilized to mark length in seconds. Each second is marked by 5 large grid blocks. In the past, the ECG was recorded on a machine that drew on long strips of paper with records from each electrode presented in a standard sequence. Now the ECG tracings are stored as computer files that are easily shared with the healthcare team.

Measuring Heart Rate: If a patient has a regular heart rhythm, their heart rate can be calculated by counting the number of squares within one R-R interval, then divide 300 by this number.



$$300 \div 4 \text{ (number of squares)} = 75 \text{ BPM (beats per minute)}$$

A patient with an irregular heart beat will have a different amount of squares between each R-R interval.

Sources: <https://kidshealth.org/en/parents/ekg.html> and <https://geekymedics.com/how-to-read-an-ecg/>

HEALTHCARE CAREER MATCHING CARDS

BUSINESS OFFICE



CARDIAC REHAB



CARDIOLOGIST



DIETITIAN



ECHO TECHNICIAN



**LABORATORY
TECHNICIAN**



NURSE



CATH LAB TECHNICIAN



PHARMACIST



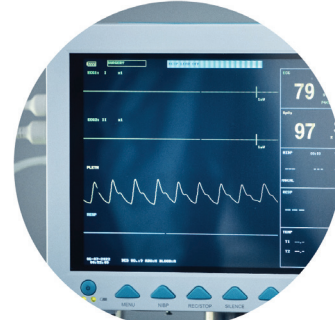
MEDICAL ASSISTANT



RESEARCHER



ECG TECH



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HEALTHCARE ROLE DESCRIPTIONS

<ul style="list-style-type: none"> • Collect information from incoming patients • Assist in completion of forms • Contact insurance providers 	<ul style="list-style-type: none"> • Plays a key role in rebuilding the strength of the heart • Develops and monitors exercise and nutrition programs • Provides support 	<ul style="list-style-type: none"> • Physician who has completed specialized training in heart and blood vessel diseases • Diagnoses, treats, and prevents diseases and conditions related to the cardiovascular system
<ul style="list-style-type: none"> • Expert in the use of food to prevent or support treatment of health conditions • Develop nutrition plans for patients 	<ul style="list-style-type: none"> • Operates imaging machines that produces images used by physicians to diagnose heart conditions 	<ul style="list-style-type: none"> • Perform medical laboratory tests for diagnosis, treatment, and prevention
<ul style="list-style-type: none"> • Assess patient health • Maintain medical records • Advise patient on taking care of themselves and prevention 	<ul style="list-style-type: none"> • Work in facilities that run tests on heart health • Monitor patients' vital signs during tests • Assist with the insertion of catheters into the heart 	<ul style="list-style-type: none"> • Dispense drugs prescribed by physicians and other health practitioners • Provide information to patients about medication
<ul style="list-style-type: none"> • Record patient history and personal information • Measure vital signs, such as blood pressure • Enter patient information into medical records 	<ul style="list-style-type: none"> • Involved in clinical trials that involve drugs or devices • Help physicians answer questions about treatment and future care options 	<ul style="list-style-type: none"> • Electrocardiograph Technician • Perform a variety of types of ECGs • Conducts cardiac stress testing



ANSWER KEY

BUSINESS OFFICE <ul style="list-style-type: none"> • Collect information from incoming patients • Assist in completion of forms • Contact insurance providers 	CARDIAC REHAB <ul style="list-style-type: none"> • Plays a key role in rebuilding the strength of the heart • Develops and monitors exercise and nutrition programs • Provides support 	CARDIOLOGIST <ul style="list-style-type: none"> • Physician who has completed specialized training in heart and blood vessel diseases • Diagnoses, treats, and prevents diseases and conditions related to the cardiovascular system
DIETITIAN <ul style="list-style-type: none"> • Expert in the use of food to prevent or support treatment of health conditions • Develop nutrition plans for patients 	ECHO TECHNICIAN <ul style="list-style-type: none"> • Operates imaging machines that produces images used by physicians to diagnose heart conditions 	LABORATORY TECHNICIAN <ul style="list-style-type: none"> • Perform medical laboratory tests for diagnosis, treatment, and prevention
NURSE <ul style="list-style-type: none"> • Assess patient health • Maintain medical records • Advise patient on taking care of themselves and prevention 	CATH LAB TECHNICIAN <ul style="list-style-type: none"> • Work in facilities that run tests on heart health • Monitor patients' vital signs during tests • Assist with the insertion of catheters into the heart 	PHARMACIST <ul style="list-style-type: none"> • Dispense drugs prescribed by physicians and other health practitioners • Provide information to patients about medication
MEDICAL ASSISTANT <ul style="list-style-type: none"> • Record patient history and personal information • Measure vital signs, such as blood pressure • Enter patient information into medical records 	RESEARCHER <ul style="list-style-type: none"> • Involved in clinical trials that involve drugs or devices • Help physicians answer questions about treatment and future care options 	ECG TECH <ul style="list-style-type: none"> • Electrocardiograph Technician • Perform a variety of types of ECGs • Conducts cardiac stress testing



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MAPPING YOUR SKILLS

Name: _____

1. Write your skills around your name. Use the Skills Bank for ideas to get you started.
2. Circle the skills you regularly use at school.
3. Put a star next to the skills you are the best at.
4. Draw a heart around skills you would like to grow or improve on.

SKILLS BANK

Problem solving	Making decisions	Motivation	Dedication	Goal setting
Prioritizing	Time management	Respect	Communication	Listening
Sharing	Responsible	Adaptable	Organized	Focus
Sense of humor	Self-control	Patience	Creative	Flexible

CAREER EXPLORATION WORKSHEET

Research the following careers. Select one career to focus on and answer the following questions.

- Cardiac Rehab
- Cardiologist
- Cath Lab Tech
- Dietitian
- Echo Technician
- ECG Technician
- Laboratory Technician
- Medical Assistant
- Nurse
- Pharmacist
- Researcher

Name of career: _____

Describe this career in 1-2 sentences.

What are some skills required for this career?

What education and training is needed?

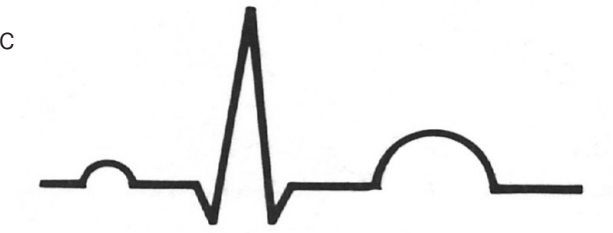
What is the average salary? _____

What are things I could do now to build skills for a career like this?

ECG WORKSHEET

Label the Waveforms: P, Q, R, S, and T

- P wave: First wave seen in the normal cardiac cycle
- Q wave: First negative following the P wave
- R wave: Any positive following the P wave
- S wave: First negative after the R wave
- T wave: After the S wave, usually positive



Match Each ECG Strip to the Type of Heart Rate



Slow Heart Rate
(Bradycardia)



Normal Heart Beat



Fast Heart Rate
(Tachycardia)

Measuring Heart Rate

If a patient has a regular heart rhythm their heart rate can be calculated by counting the number of squares within one R-R interval, then divide 300 by this number.



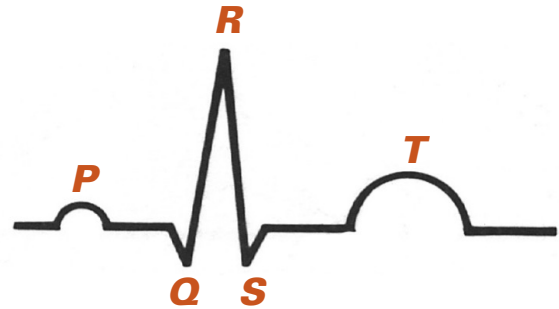
$$300 / \text{_____ (number of squares)} = \text{_____ BPM (beats per minute)}$$

Sources: geekymedics.com/how-to-read-an-ecg/ and heart.org

ANSWER KEY - ECG WORKSHEET

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Measuring Heart Rate

If a patient has a regular heart rhythm their heart rate can be calculated by counting the number of squares within one R-R interval, then divide 300 by this number.



$$300 / \underline{4} \text{ (number of squares)} = \underline{75} \text{ BPM (beats per minute)}$$

Sources: geekymedics.com/how-to-read-an-ecg/ and heart.org