The impact of tele-health education in decreasing the knowledge deficit regarding coronary artery disease in a rural area

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Abstract

Background: The objective of this study was to evaluate if using an educational tele-health intervention will reduce the knowledge deficit by a significant amount.

Methods: Using a pre-test post-test design, the study examined the effect of a brief multimedia health education curriculum on knowledge related to coronary artery disease. Specifically, each participant experienced an educational intervention consisting of a 5-minute tele-health video as well as a pamphlet explaining the pathophysiology, risk factors, and prevention of coronary artery disease. To assess change, the project included a pre- and post-survey that assessed participant knowledge related to coronary artery disease.

Results: Upon determining that the data followed a normal distribution, a paired-sample t-test was performed to compare mean scores from pre- to post-test. Post-test scores ($M = 6.38$, $SD = 1.04$) were significantly greater than pre-test scores ($M = 5.54$, $SD = 1.20$), $t(12) = -2.51$, $p = 0.03$, $d = 0.75$. Cohen’s $d$ indicates that participants improved their knowledge by three-fourths of a standard deviation, which, according to Cohen (1988), is classified as a medium-sized effect.

Conclusion: Tele-health does significantly improve knowledge base when comparing pre-test and post-test scores. Using tele-health could potentially be a useful avenue to provide medical education to rural populations in the United States.

Background

What is coronary artery disease?

Coronary artery disease occurs when a patient has narrowing of the arteries that provide oxygenated blood to the heart muscle itself. Three main coronary arteries – left anterior descending, circumflex, and right coronary artery – feed the heart. Plaque builds up in the inner lining of the arteries, and when it becomes large enough, it begins to obstruct blood flow. In situations where the heart muscle demands more oxygenated blood flow, such as during exercise, but the blood flow is partially blocked, angina occurs. Angina may manifest as squeezing or pressure over your chest, or as neck, jaw, back, or arm pain. If a plaque ruptures and completely blocks blood flow, a myocardial infarction (heart attack) occurs. Over 600,000 myocardial infarctions occur annually in the United States alone, and more than half of patients are asymptomatic. Once a
person has one myocardial infarction, he or she is at higher risk of having a second, and is also at higher risk of passing away as a result of coronary artery disease. Coronary artery disease is the leading cause of mortality in North America and Europe, even above cancer and accidents.  

Several risk factors for coronary artery disease have been identified, including hypertension (>140 systolic and/or >90 diastolic), hypercholesterolemia, diabetes, and smoking cigarettes. Particularly, increased LDL cholesterol at baseline has been found to be a major risk factor. Obesity, sedentary lifestyle, and family history of premature coronary artery disease also play into one’s risk assessment. Research has demonstrated that keeping these factors within an optimal range reduces the need for coronary interventional procedures and improves the patient’s quality of life. Most of these risk factors are linked and tend to compound the risk of coronary artery disease. For example, a patient who is overweight is also likely to have elevated blood pressure, higher cholesterol, and impaired glucose metabolism that leads to increased prevalence of diabetes. The major component of plaque is cholesterol, so keeping total cholesterol <200 and HDL >35 is a major benefit to patients. It has been shown that patients with diabetes have increased incidence of cardiovascular disease as well as poorer outcomes following myocardial infarctions and coronary interventions. In one study, it was shown that not only did diabetic patients have a greater burden of atherosclerosis, but the progression of the atherosclerosis was higher than in non-diabetic patients despite the fact that they utilize the proper medical therapies. One meta-analysis evaluated the use B vitamins and antioxidants as a potential protective agent from progression of atherosclerosis, and no advantage was demonstrated. Unfortunately, there is a considerable gap between scientific recommendations that physicians tell patients, and the way patients actually live their lives and use those recommendations.  

Several methods of estimating risk have been studied, and the Framingham Risk Score serves as the current guideline for prevention. It takes into account a patient’s age, gender, total cholesterol, HDL cholesterol, smoking status, and systolic blood pressure; it classifies patients as low, intermediate, or high risk for coronary artery disease over the next 10 years. Among the new methods of estimating risk is evaluation of coronary
Coronary artery calcium. Coronary artery calcium can be measured with a screening non-contrast cardiac CT imaging and is a non-invasive, low-cost technique to develop a more individualized risk assessment in select patients. However, the radiation exposure must be taken into consideration when deciding if this might be a worthwhile screening for a patient. A scan that shows zero coronary calcification is a very powerful protective risk factor for coronary artery disease. The American College of Cardiology and American Heart Association have given the scan a Class IIa recommendation to assess risk in patients with an ‘intermediate’ Framingham Risk Score. Class IIa recommendation means that the benefit is greater than the risk and it is reasonable to perform the procedure.

**Coronary Artery Disease in Rural America**

Rural America differs vastly from urban America, and health is no exception. Coronary Valley consists of ten states along the Ohio and Mississippi Rivers that have the highest incidence of cardiovascular disease. Within the state of Kentucky, the Appalachian region has more heart disease than other, more urban, areas. When studying Clay County in the Appalachian region, it was found that the county had lower cholesterol levels compared to more urban areas; however, there was a higher incidence of other well-known risk factors, such as hypertension, obesity, cigarette smoking, and lack of exercise. There was also a higher incidence of metabolic syndrome, which is defined as waistline >40” in males and >35” in females; triglyceride > 150; HDL <40 in males and <50 in females; hypertension >130/85; and blood glucose >100. This discovery may offer an explanation for the elevated prevalence of heart disease in rural Appalachia even though one risk factor, hypercholesterolemia, was not present in this population. The study also evaluated education level and socioeconomic status of its subjects. Researchers discovered that a positive correlation existed between having less than high a school diploma and having greater than two previously defined risk factors, indicating that poorer health was associated with a lower level of education. There was also a positive correlation between lower socioeconomic status (less than $30,000 annual household income) and having greater than two risk factors. Furthermore, these findings may be applicable to other rural areas across America.
A large percentage of patients are unaware of their chronic diseases, and the largest factor associated with being unaware of a chronic condition was living in a remote or rural area. Importantly, socio-demographic factors are associated with unknowingly having a chronic disease. Identifying these patients can allow for disease diagnosis and self-management, which makes disease control attainable. Health literacy impacts a patient’s ability to carry out self-management, so studies need to be performed to best determine how to target this rural population and increase their basic knowledge base regarding common chronic diseases.

**Implications of Tele-health in Relation to Cardiac Disease**

Tele-medicine utilizes telecommunication to transmit medical information from a patient’s remote location to a medical center for the purpose of monitoring, diagnosis, or disease management. By empowering the patient, emphasizing good patient/physician relationships, and employing evidence-based medicine, tele-health can improve patients’ overall health. Several studies have been performed in which tele-medicine is implemented to enact preventative medicine, acutely manage cardiac disease, or chronically manage cardiac disease. Tele-cardiology can be employed in a wide range of situations such as transmitting EKGs over the phone, home monitoring of patients with congestive heart failure, monitoring medication compliance, tele-auscultation, and patient education or support.

Tele-health can be applied to cardiac disease in several ways. It can be used to educate patients, to monitor patients after leaving the hospital, and interestingly, to prevent patients from making unnecessary trips to the emergency room. Patients at home with acute onset chest pain could utilize tele-medicine administered by an EMT at the patient’s home to have their EKG, troponins, blood pressure, and weight monitored by a health professional, who would advise and council the patient via the telephone. A 19-year-long study in Israel found that health professionals who would answer emergency calls of patients reporting acute onset of potential cardiac symptoms and in 85% of cases, they were able to reassure the patient and avoid a trip to the emergency room (after reviewing previously stated parameters). This study demonstrated great potential for cost-savings in those with potential cardiac symptoms by decreasing
emergency room visits, decreasing lab and imaging costs, and eliminating admissions for observation only.

Tele-health can also be used for monitoring chronic cardiovascular disease following an acute coronary event. Health care facilities can monitor blood pressure, heart rate, and weight weekly, as well as cholesterol and glucose monthly, and the rate of smoking cessation following an acute coronary event. Studies show that the best utilization of tele-health was monitoring physical activity and weight. With these two factors improving, patients also experienced improvement in blood pressure and cholesterol, though there was no change in rate of smoking cessation while being monitored.

While several studies have applied tele-health to diagnosis management of disease, few have used tele-health simply to provide information and increase patients’ knowledge about disease. This paper seeks to determine if using tele-health to provide basic knowledge of disease pathology, risk factors, and prevention is worthwhile. If the tele-health video does make an impact, it could easily be employed in physician offices to educate patients while they wait to be seen by the physician. If a video can provide the patient with basic knowledge about a particular health problem or chronic disease, the physician can then spend the appointment answering questions the patient may have. With physicians being stretched for time, this would provide an excellent avenue for relaying important information without consuming extra time. It would streamline the patient’s visit and allow ample time for questions during the visit. Therefore, this paper questions if knowledge of coronary artery disease pathophysiology, risk factors, and prevention increase following exposure to tele-health educational intervention.

**Methods**
**Settings and Participants**
This research study was conducted in the primary care office of Dr. Barbara Mowery in Sullivan, Indiana. Her practice is part of a group practice specializing in Family Medicine and is located in a medically underserved area of rural Indiana. The practice is closely tied to a critical access hospital, Sullivan County Community Hospital.
An *a priori* power analysis was performed to determine the number of participants needed in the study. First, Cohen’s guidelines for $d$ were employed to determine the preferred minimum effect size. At minimum, the analysis should detect medium effects, assuming that those effects exist in the data. Cohen defines medium effects as those with $d$ greater than or equal to .50 (i.e., differences of at least one half of a standard deviation). A power analysis conducted via the G*Power 3 software revealed that 54 respondents were necessary to detect the minimum effect with a customary power $(1 – \beta)$ of 0.80 and an alpha of 0.05, two-tailed.

All patients over 18 years of age were invited to participate in the research project. The study included 13 participants, composed of 11 (85%) females and 2 (15%) males. The age distribution of study participants was as follows: 8% ($n=1$) 18-30; 46% ($n = 6$) 31-45; 23% ($n = 3$) 56-65; 15% ($n = 2$) 66-75; and 8% ($n = 1$) older than 75. The majority (85%, $n = 11$) of participants had an annual household income of less than $30,000, while 15% ($n = 2$) earned $30,001 - $50,000 annually. No participants earned greater than $50,001 in annual household income. One (8%) participant had received a Bachelor’s degree, two (15%) an Associate’s degree, six (46%) a high school diploma, and three (23%) did not complete high school. Education information was missing for one (8%) participant.

**Data Collection**

During a two-week period of time, Dr. Mowery’s nurse registered each patient per her regular routine. She subsequently ensured the patient was greater than 18 years of age and then inquired if the patient might be interested in completing a brief pre-test survey, watching a short informational video, and completing a post-test survey. Once a patient agreed to participate, a notice of confidentiality was provided and the patient completed the tasks while waiting to be seen by the physician. Each patient completed an eight-question pre-test. They then viewed a short educational video consisting of a 5-minute tele-health video as well as a pamphlet explaining the pathophysiology, risk factors, and prevention of coronary artery disease. The patient then completed a post-test, which was comprised of the same questions presented in the pre-test.
Data Analysis
Descriptive statistics such as frequencies, mean, and standard deviation were used to examine the demographic characteristics of the sample and the distribution of scores on the pre-test and post-test. With utilization of histograms, testing for skew and kurtosis allowed for determination of whether or not the data followed a normal distribution. A two-tailed, paired-samples t-test was employed to determine if there was a significant difference between pre- and post-test mean scores. Cohen’s $d$ test was utilized to determine the magnitude of effect from pre- to post-test. An a priori alpha of .05 was used for the study. All tests were two-tailed.

Results
The paired-samples t-test assumes that the data in both variables have a normal distribution. To test this assumption, histograms along with skew and kurtosis statistics were used for both the pre-test and post-test variables; however, because histograms are difficult to interpret when the sample is small in a study, a greater emphasis was placed on skew and kurtosis statistics.

Histograms were examined for pre-test and post-test scores. The pre-test histogram (Figure 1) presented some evidence of a negative skew. This may have suggested more low responses than expected by the normal distribution. Kurtosis appeared normal for the pre-test. The post-test histogram (Figure 2) showed slight evidence of a negative skew, and it was slightly peaked, which indicated a potential kurtosis violation. While these possible violations were minimal, they provided rationale for empirical testing.
To examine the normality assumption using quantitative methods, \( t \)-tests for skew and kurtosis were conducted for pre-test and post-test scores. Specifically, these tested whether the skew and kurtosis values observed in the study were significantly different from those in a normally distributed sample. Results and descriptive statistics for each
variable are presented in Table 1. Working from an alpha of 0.05, none of the observed
$t$-scores exceed the critical value of $t$ (±15.91), which indicated that scores indeed fell
along a relatively normal distribution.

**Table 1: Descriptives and t-Tests for the Assumption of Normal Distribution for Pre-Test and Post-Test Scores**

<table>
<thead>
<tr>
<th></th>
<th>$N$</th>
<th>Min.</th>
<th>Max.</th>
<th>Mean($SD$)</th>
<th>Skew($SE$)</th>
<th>$t$</th>
<th>Kurtosis($SE$)</th>
<th>$t$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-Test</td>
<td>13</td>
<td>3</td>
<td>7</td>
<td>5.54(1.20)</td>
<td>-0.622(0.616)</td>
<td>-1.01</td>
<td>0.174(1.191)</td>
<td>0.14</td>
</tr>
<tr>
<td>Post-Test</td>
<td>13</td>
<td>4</td>
<td>8</td>
<td>6.38(1.04)</td>
<td>-0.937(0.616)</td>
<td>1.52</td>
<td>1.154(1.191)</td>
<td>0.96</td>
</tr>
</tbody>
</table>

To assess the change in knowledge after exposure to the tele-health video and pamphlet,
a paired-samples $t$-test was conducted comparing mean scores from the pre-test to the
post-test. Post test scores ($M = 6.38, SD = 1.04$) were significantly greater than pre-test
scores ($M = 5.54, SD = 1.20$), $t(12) = -2.51, p = 0.03, d = 0.75$. A medium effect (as
defined by Cohen (1988)) was observed, with participants improving their knowledge by
three-fourths of a standard deviation.

**Discussion**

Based on the results of this study, tele-health offers a potential avenue for providing
medical education to rural populations. If patients possess more in-depth medical
knowledge of common diseases, they will be empowered to better self-manage them.
Adequate self-management requires basic knowledge of the patient’s individual risk
factors, as well as appropriate strategies to influence and improve those factors. For
those residents living in Coronary Valley mentioned above, they may not realize that
several of their behaviors, such as smoking, physical inactivity, and obesity, can actually
compound and exponentially increase their risk for coronary artery disease. If a patient
thoroughly understands the risk factors for and implications of coronary artery disease,
he or she might work harder to keep blood pressure and cholesterol under control, to
maintain a healthy weight, and to cease smoking cigarettes. Targeting rural
populations and providing tele-education that addresses the aforementioned topics may
afford those patients the opportunity to take charge of several factors in their life and
work toward modifying them to reach current American Heart Association
recommendations. This would not only lower the risk of coronary artery disease, but would improve the patient’s overall health and wellness.

Because using a video to provide this knowledge has shown significant results, it would be beneficial to employ this strategy in outpatient offices and inpatient medical wards throughout the country. Physicians tend to have limited time to spend with each patient, and patients tend to complain about the amount of time they spend waiting to be seen by said physician. If patients could use the time they are waiting to be seen by the physician watching an educational video and taking the time to learn new material, their time is not wasted. This also allows the physician to enter the room and expand on the information presented in the video on an individualized basis. The physician would be able to discuss objective parameters, such as blood pressure and lab values, as well as modification strategies on an individualized basis and set simple goals to work toward prior to the next appointment. Importantly, tele-medicine can help alleviate the impact of the shortage of primary care physicians by reducing the amount of basic information they must relay during the appointment.

Furthermore, some patient’s do not grasp everything the physician says. A number of factors play into this, such as complicated vocabulary, difficult language accents, and limited time. A tele-health video may provide the means to remedy each of these issues. Firstly, the video would be specifically made for patients who have little or even no knowledge base of the topic being presented. Therefore, the video would define terms that the physician may use during the appointment and would walk the patients through each aspect of the disease in a simplified manner. Secondly, the video would incorporate persons who have a clear speaking voice and understandable accents. Lastly, having been introduced the basics prior to the appointment, more time is therefore allotted during face-to-face interactions to ensure that the patient understands the implications of their lifestyle prior to leaving the office. Furthermore, if patients hear the same material twice (in-depth on a video and summarized again by the physician), it is more likely that pertinent information will make an impact and benefit the patient.
Tele-health educational videos can be implemented in more medical specialties than only primary care, such as surgery, obstetrics and gynecology, and dermatology. Generally, patients question how the surgery will be performed, what are the risks associated with the procedure and with anesthesia, and what is to be expected in the post-operative period. An educational tele-health video could outline each of these topics either when the patient presents to the office for initial evaluation or while in the pre-operative staging area. For expectant mothers, a tele-health intervention could provide information at each obstetrical appointment about what to expect during the current stage of their pregnancy, what is occurring in the womb during that particular trimester, and what to expect at the next visit. As the pregnancy progresses, it could provide information about where to check in at the hospital once labor ensues, the birthing options available at the hospital, and possibly a virtual tour of the labor and delivery suite and nursery. At the dermatologist’s office, types of skin cancer, changes in moles, dangers of tanning beds, and use of sunscreen could be addressed during the summer months. Of course there are infinite possibilities beyond what is mentioned here, but each would ultimately allow important topics to be addressed fully while still allowing ample time with the physician to discuss the chief complaint.

Tele-medicine can provide rural patients access to care provided by scarce specialists and can improve quality of care without requiring long distance travel. More importantly, tele-medicine supports the rural doctor; by allowing the rural primary care office to continue to serve as the patient’s medical “home” even in the presence of extremely complex disease, a stronger relationship is forged between the patient and rural physician since the patient is able to receive the highest quality of care available while remaining in their local doctor’s office.

Since an overwhelming majority of the research focused primarily on disease management rather than providing preventative knowledge, it remains difficult to compare this study with prior literature. However, it is known that tele-medicine is a useful avenue for providing close monitoring and management of a handful of chronic diseases and therefore the same concept should easily transfer to the concept of preventative medicine. It has been shown that in patients undergoing cardiac
rehabilitation, utilization of psycho-education has a positive effect on smoking, weight loss, psychological distress, and to a lesser extent, modifiable physiologic risk factors.\textsuperscript{18} While the aforementioned psycho-education was delivered face-to-face during rehabilitation, this model should be easily applied via tele-health to ensure that this information is delivered to the patient prior to having severe enough disease to even require cardiac rehab. The goal would be to prevent establishment and progression of the disease by changing modifiable risk factors early rather than try to undo years of damage. By employing cognitive behavior strategies, the patients may be more motivated to change the risk factors over which they have control (i.e. smoking cessation and weight loss).\textsuperscript{18} “Poor health behaviors are known precursors to the negative risk factors that contribute to coronary artery disease; therefore, it follows that changes in behavior should lead to a reduction in risk factors of coronary artery disease.”\textsuperscript{18} With the aid of tele-health medical education, the physician can use targeted interventions to craft strategies to control those risk factors.

**Limitations**

Using a power analysis, it was originally estimated that 54 participants would be required in order to obtain significant results. Though the results obtained did actually yield improvement in post-test scores from pre-test scores that were significant, having a larger sample size would provide much more generalizable results. Small samples limit the extent to which findings can be generalized from one study to the greater population. Based on the small sample size in this study, the findings have little or no generalizability. Also, when using a histogram, results are more easily interpreted with a large sample size.

Since the questions in the pre- and post-tests were created for this study and had not previously been validated in a prior study, it is possible that the questions were not properly designed. This is manifested with the poor wording of the true or false question: *Smoking doubles your risk of having coronary artery disease.* While smoking does indeed double your risk, the correct answer was actually that smoking quadruples your risk of having coronary artery disease.\textsuperscript{1} All 13 participants chose the incorrect answer on the pre-test, and 12 of the participants also missed the question on
the post-test despite the answer being stated in the educational video. Likely, the participants recognized in the video that smokers have a quadrupled risk, but interpreted the question to be true since if the risk is quadrupled, it is, by default, doubled. Better results could have been obtained had the question been worded as follows:

Smoking _________ your risk of having coronary artery disease
a. Does not affect
b. Doubles
c. Triples
d. Quadruples

**Future Research**

Since tele-health has been shown to provide significant improvement in scores on the post-test compared to the pre-test, a future researcher could design a different survey and have classmates review it prior to its implementation so that it may be evaluated for confusing word choice and questions with multiple correct answers. A future study could also target a different topic, such as COPD, hypertension, diabetes, or nutrition.

To obtain a larger sample size, it might be useful to try to implement a similar study on the general medicine floor of the hospital. While these patients are generally more ill than those in an outpatient setting, they would have ample time to complete the study during the day, while some patients in the outpatient setting refused to participate since they did not believe they would have enough time before the physician entered the room to examine them. This would, however, require many more nurses to cooperate and administer the survey, which may be difficult since they have greater responsibilities than in the outpatient setting.

While this study gathered demographic data to establish the age, gender, income level, and education level of participants, this data was not incorporated into the research question being studied. A future researcher might be able to design a similar research study but determine which subsets of a population tele-health benefits the most and target future tele-health interventions at that population, while suggesting alternative
interventions for the population subsets who did not find tele-health beneficial. It might be that teenagers learn better from electronic media than the elderly, or that men respond better than women, and future physicians could incorporate various methods of teaching into their practices for the different learning styles of their patient population.

References
10. Gibbons, Raymond J., MD; Sidney Smith, MD; Elliott Antman, MD. American College of Cardiology/American Heart Association. Clinical Practice Guidelines: Part I Where Do They Come From? http://circ.ahajournals.org/content/107/23/2979.full
Appendix A: Pre-Test and Post-Test Questions

1. Which of the following is the leading cause of death among Americans?
   a. Cancer
   b. Diabetes
   c. Accidents
   d. Coronary Artery Disease

2. What is the definition of coronary artery disease?
   a. Disease of the arteries that supply blood to your lungs
   b. Disease of the arteries that supply blood to the heart muscle
   c. Disease of the arteries that supply blood to your brain
   d. Disease of all arteries in the body

3. Which of the following are risk factors for coronary artery disease?
   a. Obesity
   b. High blood pressure
   c. Stress
   d. A and B only
   e. B and C only
   f. All of the above

4. What causes "angina?"
   a. Your blood is getting too thick for your heart to pump
   b. Your heart muscle is not receiving enough oxygen in its blood supply
   c. Your heart valves are not functioning properly
   d. The only cause of angina is when you are having a heart attack

5. Smoking doubles your risk of having coronary artery disease.
   a. True
   b. False

6. Cholesterol level does not affect your risk of having coronary artery disease.
   a. True
   b. False

7. Which of the following is a correct statement?
   a. Coronary artery disease only happens in overweight patients.
   b. More than half of people who die of coronary artery disease are symptom free.
   c. Keeping your blood pressure at the level recommended by your doctor does not lower your risk of having a heart attack.
   d. Plaque buildup in arteries starts after age 40.

8. The symptoms of coronary artery disease are always the same for men and women.
   a. True
   b. False
Appendix B: Informational Pamphlet

**Risk Factors**
- Lack of exercise
- Uncontrolled blood pressure
- High cholesterol
- High blood sugar
- Obesity
- Smoking
- Family history of heart disease
- Age >55 in women
- Age >45 in men

**Common Symptoms**
- Chest pain (angina) that can radiate to the arm, jaw, neck, back, or even upper stomach
- Pressure or tightness across the chest
- Shortness of breath
- Nausea or vomiting
- Cold sweat
- Lack of energy

**Heart Healthy Diet**
- Manage portion size
- Increase fruit and vegetable intake
- Decrease salt consumption
- Drink more water
- Consume whole grains
- Decrease fat and cholesterol intake: less saturated fats, butter and shortening
- Choose lean meats (fish, turkey, chicken)
- Use low-fat dairy products
- Increase legume (beans, peas) intake
- Avoid fried or breaded foods; avoid fast food!

**Coronary Artery Disease**

Risk Factors, Symptoms, and How You Can Lower Your Risk

Teela Crocelius, MS4

http://www.cdc.gov/breastcancer/
What is Coronary Artery Disease?

Coronary arteries deliver oxygenated blood to the heart muscle. Over time, buildup of plaque on the inner walls of these arteries can block the blood flow to the heart. Commonly, the first symptom is shortness of breath. As the inside of the artery continues to narrow, one can experience chest pain with exercise, called angina pectoris. This pain is a sign that the heart muscle is not receiving enough oxygen. The pain usually stops when the person sits down and rests. Over time, as the artery gets even more narrowed inside, one can have chest pain while at rest. When blood flow to a portion of the heart is completely cut off, a heart attack occurs. If blood flow can be restored very quickly, damage to the heart may be prevented. However, if the blockage is not fixed quickly, the heart tissue can begin to die.

Coronary artery disease is the most common cause of sudden death in the United States. It is the most common cause of death in both men and women over the age of 20.

7 Ways You Can Lower Your Risk

Be Active:

By exercising 30 minutes 5 days a week, you can lower your weight, blood pressure, and cholesterol.

Eat Healthy Foods:

Following a heart healthy diet can help you lose weight and decrease plaque buildup in your arteries.

Regulate Blood Pressure:

By monitoring your blood pressure and keeping it in the range recommended by your physician, you lower your risk of a heart attack.

Lose Weight:

Maintaining a healthy weight lowers the stress on your heart. It also helps lower cholesterol and blood pressure.

Control Cholesterol:

This can be lowered by diet changes, exercise, weight control, and/or medications; these will reduce the risk of more plaque accumulating.

Manage Blood Sugar:

Diabetes is closely related to risk of heart disease. By controlling your blood sugars, you can keep your risk of having a heart attack lower!

Stop Smoking:

Smokers are up to FOUR times more likely to have a heart attack. Smoking speeds up hardening of the arteries. Ask your doctor to help you quit today!