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“Learning,” *Shema* and Target Theory Cardiovascular Disease Risk Factors

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How many times do we need to hear something before it becomes a part of our “life style” or “life plan?” Depending on the study, it may be five to fifty times, but always the answer is “we must hear repetitively.” Whether it is knowledge to prepare us for a job, or information which prepares us to live well, or even if it is spiritual insight, repetition coupled with attentiveness is the key to learning. In reality, we often seem to learn something suddenly, that is, it becomes real to us and active in our lives, when we have “known” the facts of that information for years. It is difficult if not impossible to create, or to predict an impressionable moment where we can guarantee “life-altering learning,” so the safest thing is to repeat critical information again and again, awaiting that “revelatory moment” when the light comes on and suddenly understanding which changes behavior occurs.

This is not unlike the concept of “target theory” which predicts response curves based on the number of events required to cause a phenomenon. This fascinating concept helps design treatments such as radiation therapy of tumors by predicting how much radiation must be given in order for individual tumor cells to be “hit” by random radiation. In teaching, or education, the question is how many “hits” are required before a person “learns.” The Hebrew word *shema* is translated “hear” in English, but it means more than the auditory function of receiving sound. *Shema* means “to hear with the intent to obey.” Hearing without a personal response is neither satisfying to the teacher nor beneficial to the student.

Cardiovascular Disease Risk Factors

As we come to the familiar subject of cardiovascular risk factors, we do so acknowledging that we have visited this information before. Yet, most of us have either not heard, or have heard without any intention to change our behavior. Perhaps for you, this will be the time to “learn,” to hear with the intention to change your lifestyle. You and I can only hope.

There are three categories of cardiovascular disease risk factors: major, independent risk factors; predisposing risk factors; contributing risk factors.

The Major Independent Risk Factors

These are the risk factors which will contribute to the causation of heart disease directly and without the influence of any other condition. It is imperative to eliminate these factors either by lifestyle changes or by medication if required for control.

- **Cigarette smoking** – without the commitment to stopping smoking, a person CANNOT support any claim to the desire to maintain, improve, or restore their health. The first requirement to stop smoking is a decision and personal commitment to quit.
- **Elevated blood pressure** – remember, if you are 55 years of age, and if you DO NOT have high blood pressure, your life time risk of developing high blood pressure is 90%, if you do not take steps to avoid its development. These steps include diet, exercise, stopping smoking, etc. The first step is to have a medical examination with your blood pressure being taken properly and repetitively.
- **Elevated serum total (and LDL) cholesterol** – you cannot know your LDL without a blood test which must be taken while fasting. Once you know you have elevated LDL, you will require lifestyle modification – weight loss, exercise and stopping smoking – and probably will require medication.
- **Low serum HDL cholesterol** -- you cannot know your HDL without a blood test. Once you know that your HDL is low, you will require an exercise program and medication to raise it.
- **Diabetes mellitus** – if you have diabetes, you can't "get rid of it," but you can successfully live with it through education, discipline and excellent healthcare. It is critical that you know and remember your hemoglobin A1C number and that you collaborate with your healthcare provider to improve it until it is consistently below 6.0.
- **Advancing age** – there is only one way to stop getting older and that is not acceptable to any of us. However, you can "age well" by the choices you make. And, even if you have made bad choices in the past, you can reverse many of the effects of those choices with lifestyle changes and medical attention.

Predisposing risk factors

These factors work with other risk factors to produce heart disease and vascular disease. They are important but not as critical as the risk factors above. It is not possible to ignore obesity as a risk factor for heart disease but if you have to choose between losing weight and stopping smoking – stop smoking.

- **Obesity** – the bad news is that any level of overweight or obesity is harmful to your health. The Good news is that you don't have to be at your ideal body weight to improve your health. A twenty-pound weight loss can make a huge difference, even if you are greatly obese.
- **Abdominal obesity** – the focus of our attention on obesity must be the fat around the waist and abdomen. It is the fat cells around our abdomen which produces harmful substances which contribute to heart disease and illness.
- **Physical inactivity** – a sedentary lifestyle is a greater risk factor for the development of congestive heart failure than having diabetes. Most people can't make a decision about whether they are going to have diabetes or not, but you can make the decision to take a daily, 30-minute brisk walk.
- **Family history of premature coronary heart disease** – you can't choose your parents or grandparents, but if they have or had heart disease you can pay closer

attention to your own health and the modifiable risk factors over which you do have control.

- **Ethnic characteristics** – as with your ancestors, you cannot choose your ethnicity, but if your race increases your risk of heart disease, you can control other factors more aggressively.
- **Psychosocial factors** – living a stressful lifestyle and/or not dealing with stress constructively will increase your risk of heart disease.

Conditional risk factors

These are risk factors whose significance is not totally known and/or which are not the primary focus of strategies to prevent heart disease. However, when the other factors are controlled or while they are being controlled, these factors will either be being improved or can be given attention. All of them require specialized blood tests which are readily available. They should be part of your evaluation if you are serious about your health. Insurance will not always pay for these tests which will test your seriousness about your health as you determine how you will use your discretionary income.

- **Elevated serum triglycerides** – this value will be determined when your lipids are measured by your doctor. If your levels are very high, they can be improved by controlling your diabetes, or by changing your diet if you are not diabetic. Excessive, non-fibrous, simple carbohydrates contribute to elevated triglyceride levels.
- **Small LDL particles** – diet, exercise and medication can change the size of your LDL. It is not only the total value of your LDL which is important but the size of the particles. Small particles have a greater effect on the development of heart disease than larger LDL particles.
- **Elevated serum homocysteine** – this is determined by a simple blood test and responds to treatment if it is elevated. While presently not paid for by some insurance plans, it will be some day. It is important for you to know your value and to decrease it if it is high.
- **Elevated serum lipoprotein(a)** -- Lp(a) is predominantly a genetic trait whose level remains more or less constant after puberty. Levels of greater than 30mg/dl have been demonstrated to independently increase the risk of CHD by six fold. Lp(a) verbalized as “Lp ‘little a.’” is a modified form of LDL. When both Lp(a) and LDL are elevated, the patient has a particularly high risk of developing coronary disease. Reduction of LDL and Lp(a) is associated with a reduction in clinical events and disease severity. Most of the lifestyle modifications (diet, exercise) and pharmaceutical agents known to reduce cholesterol have little or no effect on Lp(a) concentration. Fish oil-based diets have shown some ability to reduce Lp(a) levels, while niacin and N-acetylcysteine have shown (NAC), in certain studies, a pronounced ability to reduce Lp(a) levels.
- **Prothrombotic factors (eg, fibrinogen)** – “Prothrombotic” means an increased possibility of forming blood clots. There are a number of “factors,” proteins or substances in the blood which increase the risk of developing a blood clot. It must always be remembered that blood clotting or not clotting is a delicate and

critical balance. If your blood cannot or will not clot, you will bleed to death; if your blood clots too readily, you will die of a heart attack or other abnormal blood clotting. Normally, this clotting/not-clotting is kept in balance naturally, but in disease processes or abnormal circumstances it is not. More people have a problem with too much clotting than with not clotting enough which is why an aspirin-a-day is recommended for diabetics and those with risk factors for heart disease. Measuring your serum fibrinogen levels, uric acid, calcium, magnesium, plasminogen activator inhibitor, d-dimer, platelet count and other tests will help your healthcare provider give you an estimate of whether you have a prothrombotic state and what you can and should do about it.

- **Inflammatory markers (eg, C-reactive protein)** – There are a number of inflammatory markers in the body. Heart specific C-reactive protein, which goes up naturally when you have an infection, is an emerging risk factor which may become a major independent risk factor in years to come. All of the inflammatory markers are part of the Cardiometabolic Risk Syndrome which was previously called “insulin resistance syndrome,” “syndrome X” or the “metabolic syndrome.” Whether you have this syndrome is easy for your healthcare provider to determine with simple blood tests and a well-established equation.

Summer time is a great time to start a diet and exercise program. Visit your healthcare provider and find out how many risk factors you have for heart disease. Find out what you should do to decrease your risk. Remember, it is your life and it is your health.