

## Vanderbilt Cardio-Oncology Algorithm

### Know your ABCDE's

- A – Awareness, Aspirin
- B – Blood pressure
- C – Cholesterol, Cigarettes
- D – Diet, Dose of chemotherapy, Diabetes
- E – Exercise, Echocardiography

*The Vanderbilt cardio-oncology program has developed an ABCDE approach to cardiovascular health for the nearly 16,000,000 cancer survivors in the United States and millions more across the world. This algorithm is based in part in recognition of the cardiovascular issues that may arise in cancer patients, as well as the idea that cardiovascular prevention is the best means to treat diseases of the heart and vessels. By simplifying the algorithm, we hope this will be a useful checklist for both patients and physicians.*

### A – Awareness

Awareness is the understanding that heart disease risk factors are common in cancer survivors, and that these risk factors may be especially increased by certain cancer treatments. Awareness also refers to the ability of patients to recognize the signs and symptoms of heart disease. These include: chest pain or discomfort on exertion, shortness of breath on exertion, feeling tired easily. The following symptoms may indicate more severe form of heart disease: Sudden onset of chest discomfort or pain without any obvious exertion, chest discomfort/pain moves to the neck and jaw, significantly longer chest discomfort/pain, other: nausea, shortness of breath, sweating, light-headedness, or headache.

### A – Aspirin

People at high risk of a heart attack and heart attack survivors commonly take a daily low dose of aspirin to decrease the risk of future heart attacks or strokes. In high-risk patients with no previous heart problems daily aspirin may also be beneficial. Interestingly, recent reports show that aspirin may also decrease the risk of several types of cancers. Aspirin does increase the risk of bleeding. Therefore, the decision to start taking aspirin (and risks versus benefits) should be discussed with your doctor.

### B – Blood Pressure

High blood pressure or hypertension, characterized as blood pressure  $>140/90$  mm Hg or  $>130/80$  mm Hg in diabetes mellitus patients, is an important risk factor for heart disease. Hypertension can result in hypertensive heart disease, heart attacks, stroke, and other heart diseases (including heart failure) if left untreated.

Therefore, it is crucial for patients to work with their doctors to monitor and treat their blood pressure with appropriate lifestyle changes and medication.

## **C – Cholesterol**

Cholesterol can build up in the vessel wall, blocking blood flow, and is an important risk factor for heart attack and stroke. Every cancer survivor needs to have his/her cholesterol checked regularly by his/her physician. Specific cancer therapies can also increase the cholesterol. For example, androgen deprivation therapy (ADT) used in prostate cancer survivors, can change cholesterol metabolism and increase the risk of heart disease. Men can work with their doctors to identify lifestyle changes and medications to lower cholesterol levels.

## **C – Cigarettes, Smoking/Tobacco Cessation**

Cigarette smoking is the number 1 preventable cause of all death (including both cancer and cardiovascular disease) in all cancer survivors. Cancer patients and cancer survivors should talk with their doctors about ways to stop smoking. There are many options to help patients, including over-the-counter gum and patches, prescription medications, and support groups. It is also important to have the support of family and friends to help remain smoke free after quitting.

## **D – Diet**

The ancient Greek physician, Hippocrates, said more than 2 thousand years ago “Let food be thy medicine”; indeed, a healthy diet leads to a healthy heart. A healthy diet is an important part of lifestyle therapy for many conditions, including high blood pressure, high blood cholesterol, and diabetes mellitus. Some steps to modify your diet include controlling serving size, eating more vegetables and fruits, minimizing trans fats, cholesterol and salt, as well as eating low-fat protein sources like lean meats, seafood, and beans. Including your family in dietary changes can help make dietary changes last. It is much easier for everyone to eat healthy together than for 1 person to try to make changes completely on his own.

## **D – Diabetes**

Diabetes mellitus or high blood sugar is a major risk factor for heart disease. Each cancer patient or cancer survivor should be screened for diabetes mellitus. Heart disease is the number 1 cause of death in diabetics. Patients who are diagnosed with diabetes mellitus can make lifestyle changes and may be treated with medications to manage blood sugar. Controlling other risk factors, such as high blood pressure and cholesterol, is also an important part of decreasing the risk of heart disease for patients with diabetes mellitus.

## **D – Dose**

Some of the heart and vascular effects of chemotherapy and radiation are dose related, which means that the risk of heart disease is directly proportional to total dose of therapy received. Such is the case with anthracyclines (drugs such as doxorubicin) and chest radiation. Fortunately, standard doses have been developed to limit heart damage and to maximize anticancer effects. Ask your oncologist about the amount of chemotherapy or radiation to your heart that you will need to receive in total.

## **E – Exercise**

Structured regular exercise (defined as  $\geq 150$  minutes per week of at least moderate-intensity activity) is associated with profound reductions in the risk of heart disease. How specifically

exercise leads to such benefits is unknown, but exercise improves a number of traditional risk factors for heart disease. These include controlling body weight, blood pressure, lowering cholesterol, and decreasing the risk of diabetes mellitus.

Exercise training is a safe and tolerable adjunct therapy for cancer patients and cancer survivors. Several national as well as international agencies now recommend exercise for all cancer patients both during and following cancer therapy.

## **E – Echocardiogram**

Some cancer survivors who received certain chemotherapies, for example, anthracyclines such as doxorubicin (Adriamycin), should be considered for an echocardiogram after completion of chemotherapy to look for structural changes in the heart. An echocardiogram uses ultrasound waves and carries no additional radiation risk to the patient. The specific decision as to who would benefit from an echocardiogram following completion of cancer therapy is an individual decision and one that needs to be discussed with one's physician.