

# LIFELine

St. Jude for Life

Winter 2015-2016



## Early Detection and Heart Health



Dr. Dan Mulrooney led the study looking at heart problems in St. Jude LIFE study participants.



Dr. Greg Armstrong led the study of new screening methods for early detection of heart conditions.

St. Jude LIFE Study  
Toll-Free Number:  
1-800-775-2167

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**LIFE**  
St. Jude for Life



Dear St. Jude Alumni,

**F**or childhood cancer survivors, research is important at every stage of their journey.

Because of the clinical research that led to today's advanced treatments, most children and adolescents diagnosed with cancer are now cured. With the majority of children with cancer becoming long-term survivors, research focusing on life *after* treatment has become increasingly important. Survivorship research has led to a better understanding of the health challenges survivors face because of the treatments they received.



An important aspect of survivorship research is finding new ways to detect treatment-related health problems at an early stage, when they can most easily be treated. Survivors' can't change their treatment exposures or the associated health risks, so early detection of problems is among the most powerful tools we have for helping them maintain their health. As the studies we feature here show, the St. Jude LIFE study is leading the way in this area.

Dr. Dan Mulrooney's work on heart problems related to treatment exposures used information from the LIFE study's comprehensive medical evaluations to systematically assess the heart health of study participants. In his paper, Dr. Mulrooney reports that the study evaluation led to the discovery of early heart problems in many participants who did not have any visible symptoms of heart disease. This finding emphasizes that survivors may need to be screened for health problems at earlier ages than people in the general population.

Dr. Greg Armstrong's paper on new types of echocardiographic screening for heart problems describes an exciting new technology that may be better than a standard echocardiogram for detecting heart disease in its earliest stages.

At St. Jude we are dedicated to conducting research that helps our survivors maintain their health throughout their lives. As Dr. Armstrong says, "The challenge for us as doctors is not to be content simply with improving lifespan, but to be dedicated to improving the 'health span' of our survivors."

Your participation in the St. Jude LIFE study contributes to advances in knowledge that can benefit all childhood cancer survivors. Thank you for your continuing support of the study and for your commitment to St. Jude.

To your health!

A handwritten signature in black ink that reads "Melissa M. Hudson, M.D."

Melissa M. Hudson, MD

*Principal Investigator, St. Jude Lifetime Cohort Study*

# Heart conditions: a common side effect of cancer treatment

A major goal of the St. Jude LIFE study is to inform survivors about the health risks linked to cancer treatments so they can take action to protect their health. Now, a team of St. Jude researchers has completed a study of heart conditions among study participants who were exposed to anthracycline chemotherapy and/or radiation to the chest. These treatments can have a toxic effect on the heart. The team, led by Dr. Dan Mulrooney, analyzed the results of the LIFE study comprehensive evaluations of 1,843 of these survivors.

**The research team looked at four types of heart problems.** The number of heart conditions found was low and most were mild. Mild problems with the heart valves were the most common problems found. The conditions examined in this study included:

**Cardiomyopathy**, a problem with the heart muscle that makes it harder for the heart to pump blood to the rest of the body. Cardiomyopathy can lead to heart failure, a condition in which the heart becomes too weak or stiff to pump efficiently.

Cardiomyopathy was found in only about 7 percent of the study participants. However, the condition was discovered for the first time during the LIFE study evaluation in almost 5 percent. Cardiomyopathy was linked to both anthracycline chemotherapy and chest radiation.



Survivors who were exposed to treatments that are toxic to the heart continue to need life-long follow-up. It is important that they understand their treatment history and how best to maintain a heart-healthy lifestyle.

*“During the LIFE study evaluations we found some survivors who had early heart disease even though they didn’t have any symptoms. Many of these individuals might not get routine cardiovascular screening because of their young age.”*

Dr. Dan Mulrooney

**Coronary artery disease (CAD).** CAD is a result of buildup of cholesterol in the arteries that supply the heart. It can lead to blockages and narrowed arteries that may cause heart attacks.

The occurrence of CAD was low. It was found in about 4 percent of the participants and was first discovered in 2.2 percent during the LIFE study evaluation. CAD was linked to radiation doses of 1500 cGy or more.

**Heart valve problems.** The heart valves are the parts of the heart that open during a heartbeat so that blood can flow from one chamber to another, and close to make sure that blood can’t leak back out. Valve problems are usually mild but in advanced cases they may lead to heart failure and other complications.

28 percent of the study participants had problems with their heart valves. Valve problems were first discovered during the study evaluation in about 25 percent. Valve abnormalities were linked to a combination of high-dose anthracycline chemotherapy and high-dose chest radiation.

**Conduction disorders and rhythm abnormalities.** A conduction disorder is a problem with the electrical signals that stimulate the heart to beat. Rhythm abnormalities result in an irregular heartbeat. They can be an emergency or harmless.

These abnormalities were found in about 5 percent of the study participants and first discovered during the study evaluation in 1.4 percent. Conduction and rhythm abnormalities were linked to radiation doses of 1500 cGy or more.

## Why is this study important?

A remarkable finding of this study is that so many heart conditions were discovered for the first time during the LIFE study evaluation. While most of the problems were not severe, this fact does underscore the importance for survivors of knowing their treatment history and sharing it with their health care providers so they can receive the right health screenings based on their specific risks. We also hope that being aware of their treatment-related risks will motivate survivors to take control of their own health by practicing heart-healthy behaviors like exercising, not smoking, and avoiding junk food.

The results of this study will be published soon in *Annals of Internal Medicine*.

# Improved screening methods may help survivors stay healthy

A team of St. Jude researchers led by Dr. Greg Armstrong recently published results of a study of a new method for early detection of heart problems. This method, called myocardial strain, is measured during an echocardiogram (ECHO), an ultrasound test of the heart.

## Who was included in this study?

The study included 1,820 St. Jude LIFE study participants who had been treated for childhood cancer with anthracycline chemotherapy, radiation to the chest, or both.

## How did the researchers test participants' heart function?

The researchers did a comprehensive ECHO test that included both the standard measurement of heart function known as the **ejection fraction** and the newer measurement, **myocardial strain**. They also evaluated diastolic heart function, or the ability of the heart to relax between contractions.

**A new way to test heart health.** The ejection fraction is a measure of the amount of blood pumped out (“ejected”) from the heart with each heart beat. The ejection fraction may sometimes be calculated inaccurately because of variations in quality of the ultrasound image or because of differences in interpretation of the images. Myocardial strain has shown promise in detecting heart muscle problems more accurately and at earlier stages than ejection fraction. Myocardial strain is also measured as part of an ECHO test. It measures the stiffness of the heart muscle based on changes in the shape of the muscle fibers as the heart beats.

## The research team found that . . .

- About 6 percent of the participants had an abnormal ejection fraction, indicating a problem with the heart. **However, almost a third of the survivors with a normal ejection fraction had evidence of early heart dysfunction when measured by myocardial strain.**
- Survivors who had three or more of the known risk factors for heart disease, including abdominal obesity (large waist compared to hips), high blood sugar, high blood pressure, or high levels of fat in the blood (high cholesterol and/or high triglycerides) were twice as likely to have abnormal myocardial strain results. Abnormal myocardial strain was linked to anthracycline dose and to radiation dose.

## Why is this study important?

The results of this study show that traditional ECHO tests that focus on ejection fraction may not be adequate to detect early heart dysfunction in adult survivors of childhood cancer. Almost one in three survivors who had a normal ejection fraction had abnormal myocardial strain results. Survivors with these results may be at higher risk for heart disease. The very early detection of heart dysfunction provided by measuring myocardial strain might make it possible to identify survivors who could benefit from early medical intervention.

*“Because of recent growth in our knowledge of long-term effects on the heart in survivors of cancer,” Dr. Armstrong notes, “a new medical specialty called cardio-oncology has developed. Cancer survivors with concerns about their heart should consider finding a cardiologist with experience in cardio-oncology.” Since this is a new field, doctors who are experts in cardio-oncology are more likely to practice at a university or a comprehensive cancer center.*

*If you aren't able to find a cardio-oncologist in your area, you can help your regular cardiologist help you by informing him of your treatment history. It might also be useful to share this newsletter with your health care team.*



*Echocardiogram images of myocardial strain, showing changes in shape of heart muscle fibers*

The results of this study were recently published in the *Journal of the American College of Cardiology*.

## **Protect your heart: Step-by-step advice from the AHA**

See the American Heart Association web site to learn about 7 simple steps to protect your heart:

[www.heart.org/mylifecheck](http://www.heart.org/mylifecheck)

# Determination in Tupelo

In the Spring of 2014, Catherine Mize and her family survived a devastating tornado that hit her home town of Tupelo, Mississippi. “The tornado took the roof and the front porch off the house and we lost hundreds of trees,” she recalls. “But, fortunately, we all survived—and no one died in Tupelo.”

By that time, Catherine was a practiced survivor. While away at college, she had been diagnosed with Hodgkin lymphoma. Her uncle, a pediatrician in Tupelo, took her to St. Jude to be treated. The year was 1978 and 21-year-old Catherine was one of the oldest patients at the hospital.

Thanks to St. Jude, Catherine survived childhood cancer. “Back then, it was clear to me that St. Jude was a place that was filled with a remarkable spirit of hope and community,” she recalls. “Patients, families, and medical staff all ate together in one cafeteria. The spirit of the place gave you confidence that you could be cured, that people here were *dedicated* to curing you.” When she returned to participate in the St. Jude LIFE study, she felt that same spirit. “The campus is very different now than it was during my cancer treatment but I was glad that feeling of hope and community was still there—even though St. Jude had grown so much, the same feeling was still there.”

To cure her lymphoma, Catherine received radiation to the chest, a therapy that is linked to many side effects including heart problems. “Because of some problems that were found during one of the LIFE study evaluations it was recommended that I see a cardiologist, and I was later asked to participate in a St. Jude LIFE heart study.” During the heart study the results of an EKG and stress test raised some concerns. Dr. Tim Folsie recommended that Catherine’s cardiologist schedule her for a heart cath (cardiac catheterization) procedure. A heart cath is a test that allows doctors to see x-ray pictures of the insides of the coronary arteries and discover how well the heart is functioning.

“The test showed that two of my arteries were completely clear, but one was 99 percent blocked,” says Catherine. “They inserted a stent in the blocked artery.” (A stent is a tube-shaped device used to keep the artery open so blood can flow through.) Since the stent was placed, Catherine has had regular follow-up appointments with her cardiologist. She is on blood pressure and cholesterol lowering medications. But she has no medically ordered activity restrictions. “When I go to the cardiologist I get a good report,” she says.

If you'd like more information about participating in research, please contact us. The St. Jude LIFE study toll-free number is:  
**1-800-775-2167**

Our email address is: [sjlifeline@stjude.org](mailto:sjlifeline@stjude.org)  
The study website is: [www.stjude.org/sjlifeline](http://www.stjude.org/sjlifeline)

**Thank you for participating in survivor research!**

my health challenges and can communicate well with my doctors.”

“I am lucky to have a great primary care doctor at home,” she continues. “I’m not sure everybody has that. But I think it’s so important for all childhood cancer survivors to have a good relationship with a primary care doctor who understands their medical history. I wish I could make that happen for all survivors.”

Today, Catherine leads a very busy life. She is married, with two adult sons, a daughter-in-law, and an infant grandson. Another grandson is expected soon. She works part-time at her family business, a clothing and gift store in Tupelo that opened in 1905. “I have a big extended family and most of them live in town so I’m very involved with family and community activities,” she says.

A lot of her time is taken up with dealing with the effects of the 2014 tornado. “Most of my time in the past year has been focused on getting the house and yard back in shape. The house is back. The yard will be a lifelong project. I’m planting four trees today!” she says cheerfully. It’s not just her yard—for Catherine Mize survivorship is a lifelong project.



In addition to heart disease, Catherine has also survived breast cancer and is coping with some lung problems, both conditions linked to chest radiation.

Reflecting on her health challenges, Catherine states, “Because of the LIFE study, St. Jude saved my life twice. My participation in the study has made me a better patient for my doctors and a better advocate for my own health because I understand more about

## LIFELine

Melissa M. Hudson, MD, Medical Editor  
[melissa.hudson@stjude.org](mailto:melissa.hudson@stjude.org)

Dept. Epidemiology & Cancer Control  
St. Jude Children's Research Hospital  
Memphis, Tennessee

E-Mail: [sjlifeline@stjude.org](mailto:sjlifeline@stjude.org); [www.stjude.org/sjlifeline](http://www.stjude.org/sjlifeline)