

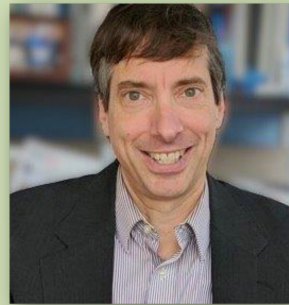


# Pathways to a Cure

## The CAA Newsletter

### Message from the Director:

**Greetings to our wonderful CAA community.**



Scientific developments remain exciting in the CAA world. As many of you know (and can read more about in this issue), CAA is positioned at the intersection between blood vessels and movements of substances in the brain like amyloid. We continue to focus a lot of studies in this area, because of the potential for improving blood vessel function and preventing various types of brain injuries, including hopefully Alzheimer's Disease.

This central role for CAA and blood vessels has also come into focus with the new antibody treatments being used to treat patients with Alzheimer's Disease. There is now good reason to think that CAA plays a role in the kind of brain swelling and micro bleeding that has been the major adverse side effect of these otherwise promising treatments.

So, a lot for us to do! I will close by wishing our wonderful CAA community good health and happiness in the new year.

Best, Dr. Steve Greenberg

### A Look into Vasomotion

The aim of *Vasomotion*, a sub-study of *Assessing Mechanisms of Injury in Cerebral Microangiopathies* headed by Dr. Edip Gurol, M.D., M.Sc., is to evaluate the relationship between vessel dilation and fluid movement in the brain. Through imaging of healthy individuals and those with CAA, a common type of cerebral Small Vessel Disease (cSVD), we hope to pioneer this understanding.

CAA is caused by a build-up of the protein amyloid in the walls of the small blood vessels in the brain. This build-up reduces the ability of the small blood vessels to dilate. Vessel dilation facilitates fluid movement in the brain, and it is this fluid movement that helps to clear toxic proteins, such as amyloid.

A current hypothesis suggests that cells in the walls of small blood vessels may be useful targets for future therapies, which aim to increase vasomotion and the brain's ability to clear amyloid. To test this hypothesis, the sub-study uses functional MRI (fMRI) scans with a visual stimulus task, activating the visual cortex and measuring fluid flow dynamics in the brain.

*(Continued on page 2)*



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### A Look into *Vasomotion* (Continued from page 1)

***In the following interview, Thijs van Harten, Ph.D., a Research Fellow at JPK Stroke Research Center, tells us more about his research experiences and gives an inside look at the Vasomotion sub-study:***

#### **Tell us about your previous research experience!**

I started with CAA research during my Master's studies at Leiden University in the Netherlands. I studied Biomedical Sciences, and did a project on MRI in Hereditary CAA. From there, I secured an internship at the JPK Stroke Research Center at Massachusetts General Hospital (MGH), doing imaging research on CAA in donated brains. After that, I returned to Leiden to complete my Ph.D. on "Advanced MRI Markers for Cerebral Small Vessel Disease."

#### **Why is this study important?**

We are interested in looking at brain function after stimulation and how that may be related to the movement of fluids in the brain. Using an MRI machine, we can see both of these processes. We are hoping that the Vasomotion sub-study will help us learn whether there is a difference in the connection between these two processes in CAA patients as compared to healthy individuals. Understanding differences between patients and healthy individuals is important in the investigation of a disease treatment. This study will help us learn more about the mechanisms of CAA and what can be done to combat it.

#### **What is your role in Vasomotion?**

My role is mainly in the acquisition and analysis of the data obtained through the imaging processes. I am also involved in designing the MRI sequences used in the study. In an MRI picture, there is much more information than just what can be seen by eye. Using computer software, we can extract characteristics that describe physiological or structural changes that can be observed in real time, or between patients and healthy participants later on. For example, while the patient is in the MRI scanner, we can have them look at bright flashing lights or inhale certain amounts of CO<sub>2</sub> and measure the response of the small blood vessels in the brain to these stimuli.

#### **Can you introduce us to the Vasomotion sub-study team?**

Susanne van Veluw, Ph.D. is the Principal Investigator of the *Vasomotion* sub-study at the MGH, with Hilde van den Brink, Ph.D. as second-in-command. The pair have experience working with advanced MRI techniques, most recently in the context of a Vessel Enhancement study which used a contrast agent called Dotarem to identify leakage from small blood vessels in the brains of individuals with CAA.



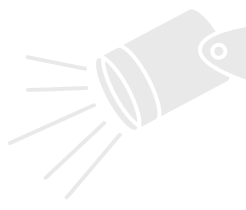
*Pictured left to right: Susanne van Veluw, Ph.D., Hilde van den Brink, Ph. D., Thijs van Harten, Ph.D.*

#### **What motivates you to do research?**

I have always been intrigued by the brain. I am motivated to learn more, to know more, and to understand the processes of disease better. I am especially interested in MRI research because it is the happy marriage between the brain and technology. The amount that we understand about how the brain works is very little compared to what remains to be understood, and it's a really cool thing to be able to be part of increasing that field of knowledge.



# Patient Spotlight: Stephen Barnes



*A diagnosis of CAA is often a life-altering experience for patients. In the below interview with CAA patient and research participant Stephen Barnes with his wife Kathie and daughter Stephanie, we learn more about their experience with CAA and why they chose to participate in research.*

## Share with us your CAA journey - what was the diagnosis experience like?

**Kathie:** When Stephen was 60, he had a small ischemic stroke. At first, his care team was looking for issues with his heart. Six months later he had a serious hemorrhagic stroke. He went to an excellent rehab and recovered quite well. About a year later, after trying to figure out why these strokes had occurred, neurologists raised the possibility of CAA. After doing some research to find CAA experts, we had our first appointment with Dr. Greenberg in March 2020. Everything was going well for awhile, with only another small ischemic stroke and seizure, and Stephen was able to still work in a reduced capacity. In March 2021, Stephen had a second hemorrhagic stroke and was hospitalized for 1 month. He has continued with rehab for aphasia and apraxia, both of which have been improving, and we continue to work with our local neurologist in Phoenix. We informed Dr. Greenberg about the stroke in October 2021, and he called us immediately and told us about the research study.

## Were there any resources or support groups that were particularly helpful to your family throughout the diagnosis?

**Stephen:** There were a lot of papers I read when first learning about CAA. My neurologist in Phoenix was able to help me understand what was going on. Anything that I could find about CAA, I read and tried to learn as much as possible. Although [there is no cure], Dr. Greenberg was very helpful in explaining what I had to accept and how to understand the things I had read.

**Stephanie:** I am a part of a couple different Facebook support groups for people with loved ones that have been diagnosed with CAA. In the beginning that definitely helped me - I had never heard of this disease and it was helpful to connect with others who were experiencing it too.

**Kathie:** We all said, "What the heck is this?" Stephen was 60 years old and completely healthy. Now, we understand CAA much better and are in a place of minimizing stroke risks, and trying to maximize the recovery when they do come. Stephen is currently in a holistic rehab program which has been terrific.

## What inspired your participation in CAA research?

**Stephen:** We don't expect that there will be a CAA cure for me personally, but I would like to be part of helping to figure out how the disease works, rather than sitting around and waiting for things to happen.

**Kathie:** We feel fortunate that we had a path to know how to help by having existing relationships at Mass General and support from Dr. Greenberg.

## What would you like to tell others who are going through something similar with a loved one?

**Stephen:** One thing for me was how difficult it was to find information about CAA. It took a lot of time to find useful resources. Even if we don't know how to cure CAA, knowing other people who have been going through this has been very helpful.

**Kathie:** There is this overwhelming feeling of being totally alone in this, but you just have to start asking questions and one thing leads to another. We are now 6 years into it, but in the beginning we didn't know anything about CAA. Family and friends have provided us with great support, and that has been critical, and we have also found a great amount of assurance and advice from the professionals we have worked with.



**Kathie:** Barrow Neurological Institute hosted an event called *Strikeout Stroke* at a baseball spring training game. Stephen threw out the first pitch. A year prior, because of the stroke, he couldn't say the word 'ball'. But on this day he not only could say it, but throw it... and a pitch at that. You can see the joy on our faces!



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### Meet the CAA Research Coordinators



**Alex Hone**

Alex is the lead coordinator for Dr. Edip Gurol's study "*Assessing MEchanisms of injuRy In Cerebral microangiopathiEs*" (AMERIQUE). Alex is excited to be working with all the research participants and everyone involved in the study to develop a better understanding of cerebral small vessel disease.



**Arianna Tidball**

Arianna leads neuropsychological testing for AMERIQUE and Asymptomatic and supports MRI scans for both studies. Arianna has spent over two years in neurology research at MGH and is excited to work with CAA research participants at the JPK Stroke Research Center to learn more about cerebral small vessel disease.



**Mary Cate McGlone**

Mary Cate is the lead coordinator for Dr. Anand Viswanathan's study "*Vascular Pathology in Early and Asymptomatic Cerebral Amyloid Angiopathy*" (Asymptomatic). Seeing the experience of CAA through her research subjects motivates Mary Cate to do all she can to advance research that helps those suffering from the disease.

## Looking to Support CAA Research?

Many patients and families have lent their time and energy to finding a cure for CAA by helping raise funds for our research program. The CAA Research Team at MGH encourages your interest in hosting a charity event or fundraising among friends and family and appreciates the efforts many of you have already made to this end!

### Individual donations can be mailed to:

MGH Development Office c/o Kylie Baruffi  
125 Nashua Street, Suite 540 Boston, MA 02114

\*Please make checks payable to Mass General Hospital, memo: #1200-02818

## To learn more about CAA:

### Visit these websites!

www.angiopathy.org  
www.caaforum.org  
www.facebook.com/CerebralAmyloidAngiopathy

To learn how to support CAA research at MGH, visit this link:  
<https://giving.massgeneral.org/crowdfunding-community-fundraising/>

Or scan the QR code:

