UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF NEW HAMPSHIRE

Jeanice Farley, individually
and on behalf of Michael Farley,
an incompetent adult

v.

Civil No. 13-cv-261-LM
Opinion No. 2015 DNH 064

United States of America

MEMORANDUM AND ORDER

In October of 2010, Michael Farley experienced symptoms including the loss of his peripheral vision and a painful headache. A veteran of the United States Navy, Mr. Farley sought treatment at the Veterans Administration Medical Center in Manchester, New Hampshire ("Manchester VA"). There, Mr. Farley was examined and given a series of tests, and he learned that he had suffered a stroke.

It is a basic principle of medicine that a patient who has suffered a stroke is generally at an elevated risk of suffering a second stroke. Therefore, doctors who are treating stroke patients must be cognizant of this risk, and they must take steps to prevent a second stroke from occurring. As such, the established standard of care requires that a stroke patient undergo a thorough diagnostic evaluation to determine the cause

of his stroke, and it requires that the patient be prescribed certain medication to treat the underlying condition that caused the stroke to occur.

Unfortunately, Mr. Farley's doctors at the Manchester VA did not adhere to this standard of care. They failed to provide him with an adequate diagnostic evaluation, and as a result, they carelessly prescribed him the wrong medication. In the words of one of the expert witnesses, Mr. Farley was "medically abandoned" by his doctors.

Approximately six weeks after his initial visit to the Manchester VA, Mr. Farley suffered a second stroke. This second stroke was massive, and it left Mr. Farley with "locked-in" syndrome, meaning that he remains fully conscious, but has no voluntary muscle movement other than the very limited ability to move his eyes and his head.

Now, Mr. Farley's wife, Jeanice Farley, has brought suit on his behalf under the Federal Tort Claims Act ("FTCA"), 28 U.S.C. §§ 2671 et al. The court held a four-day bench trial from October 21 to October 24, 2014. After considering the trial testimony and the record evidence, it is the finding of this court that two of Mr. Farley's doctors at the Manchester VA committed medical malpractice and are legally responsible for failing to prevent Mr. Farley's second stroke from occurring.

This memorandum and order will more fully set forth the court's findings of fact and rulings of law. See Fed. R. Civ. P. 52(a).

Findings of Fact

I. The Expert Witnesses

The court's understanding of the complex issues involved in this case was aided by expert testimony offered by both parties. The following expert witnesses testified on behalf of the Farleys regarding liability:[1]

- Dr. Bruce Charash, a cardiologist at the Lenox Hill Hospital in New York City.
- Dr. James Frey, a stroke neurologist at St. Joseph's Hospital in Phoenix, Arizona.
- Dr. Kenneth Stein, an emergency room doctor at St. Anthony's Medical Center in St. Louis, Missouri.
- Dr. J. Neal Rutledge, a neurointerventional surgeon from Austin, Texas.

The following expert witnesses testified on behalf of the government:

- Dr. David Greer, a neurologist and the director of the stroke service at Yale University Hospital in New Haven, Connecticut.
- Dr. Warren Manning, the section chief of non-invasive cardiac imaging at Beth Israel Deaconess Medical Center in Boston, Massachusetts.

[1] As will be discussed below, the Farleys also offered the testimony of two damages experts.

- Dr. Louis Caplan, a neurologist and senior member of the stroke service, also at Beth Israel Deaconess Medical Center in Boston.

- Dr. Anthony Kim, a stroke neurologist and the medical director at the University of California San Francisco Stroke Center.[2]

At points throughout this memorandum and order, the court has included specific credibility findings pertinent to individual expert witnesses. However, the court notes that, on many occasions, the expert witnesses testified regarding issues beyond their immediate fields of specialty. For example, several of the neurologists testified regarding cardiovascular issues, and several of the cardiologists testified regarding neurological issues.

Nevertheless, the evidence established that the treatment of stroke patients is very much an interdisciplinary practice, and requires a working knowledge of both cardiovascular and neurological issues. Thus, while the court gave more weight to testimony that directly related to an expert's field of specialty, the court acknowledges that these specialties often overlap in the treatment of stroke patients, and the court

[2] Dr. Kim was unavailable to testify at trial because he was previously scheduled to attend a series of conferences. The government introduced into evidence the transcript of Dr. Kim's deposition, and the court has reviewed this transcript in full. Video excerpts of Dr. Kim's deposition were also played at trial.

assigned weight to the testimony accordingly. In assessing the credibility of the expert witnesses, the court has also considered, among many other factors, the witnesses' backgrounds and areas of expertise, curricula vitae, and publication histories.

II. General Stroke Principles

Broadly speaking, there are two types of stroke. An "ischemic," or "dry" stroke occurs when the arteries leading to the brain become narrowed or blocked, resulting in reduced blood flow. A "hemorrhagic," or "wet" stroke occurs when a blood vessel in the brain leaks or ruptures. In this case, the parties agree that Mr. Farley's first stroke was an ischemic stroke.

With rare exceptions, ischemic strokes can be further categorized as either "thrombotic" strokes, or "embolic" strokes. In this case, while the parties agree that Mr. Farley suffered an ischemic stroke, there is disagreement over whether the stroke was thrombotic or embolic.

A thrombotic stroke occurs when a blood clot forms in the arteries that supply blood to the brain. Most commonly, these blood clots result from deposits of a substance known as atherosclerotic plaque, which can accumulate in the arteries.

The plaque deposits can break away and travel through the blood stream to the brain, where they can cause a stroke. Approximately 80% of ischemic strokes are thrombotic in nature.

An embolic stroke occurs when the blood clot responsible for causing the stroke forms in another part of the body, and sweeps through the bloodstream, ultimately making its way to the brain and causing a blockage. Approximately 20% of ischemic strokes are embolic in nature and the vast majority of embolic strokes involve "cardioembolic" blood clots, or blood clots that form in the heart.

The evidence established that there are five potential causes of a cardioembolic blood clot: a tumor in the heart known as a myxoma; an infection of the heart valve called endocarditis; a hole in one of the walls of the heart; a disorder known as atrial fibrillation; and the development of a blood clot in the left ventricle attributable to an irregular heartbeat. The parties appeared to agree that Mr. Farley did not have myxoma, endocarditis, or a hole in the wall of his heart. And, as will be discussed below, the weight of the evidence established that Mr. Farley did not suffer from atrial fibrillation. Thus, the vast majority of the trial testimony

relevant to cardioembolic blood clots focused on whether Mr. Farley had developed a clot in his left ventricle.

Dr. Charash, the Farleys' expert cardiologist, explained the process through which blood clots may form in a patient's left ventricle. Dr. Charash explained that, in a normally functioning heart, blood flows in a smooth, laminar fashion as the heart contracts in an efficient and symmetrical fashion. Dr. Charash drew an analogy to rushing water, explaining that "[i]f you take a river or rapids and throw a plastic cup in, it's going to go flying down the river. The chance of it just sticking on the side in the rapids is very low because the momentum of the fluid drives it downstream."

Dr. Charash testified that certain abnormalities in a patient's heart may allow blood clots to form. This is particularly true, Dr. Charash explained, when the patient's heart is beating in an asymmetrical fashion. An example of such asymmetry, Dr. Charash testified, would be if certain walls of the patient's heart were contracting faster or slower than other walls. Dr. Charash and other experts described this condition as a "segmental wall motion abnormality."

This distinction between symmetrical and asymmetrical weakening of the heart is important. Symmetrical weakening, Dr. Charash testified, refers to a uniform weakening of the heart.

A patient will be said to be suffering from symmetrical weakening when his heart is pumping blood with diminished efficiency, but when the mechanics of the heartbeat are otherwise normal. Dr. Charash explained that this global weakening might occur, for example, as a result of prolonged alcohol abuse, chronic high blood pressure, or a viral disease.

Asymmetrical weakening, on the other hand, refers to a scenario where a patient's heart exhibits signs of weakening in some areas but not others. Dr. Charash testified that symmetrically weakened hearts are less likely to produce blood clots, while asymmetrically weakened hearts are at much higher risk. Dr. Charash explained as follows:

> The global [weakening] group, even though [the heart is] weakened, has symmetric contraction, and that somewhat lessens the risk of forming a blood clot . . . . [A] segmental wall motion abnormality [] is the one that carries the greatest risk of clot formation.

In a symmetrically weakened heart, Dr. Charash explained, the blood continues to move in a smooth and uniform fashion. In an asymmetrically weakened heart, however, the blood has an opportunity to form eddies or pools because the heart is not expanding and contracting in a uniform fashion. This disrupts the flow of blood and can lead to areas of stagnation where blood clots are likely to form. Dr. Charash again invoked the

same rushing water analogy, explaining that "a blood clot will typically form on a wall of the heart because that's where the most stagnant flow is, just like in a rapids. The speed is quickest in the center, where on the side it's slower."

The evidence established that a cardioembolic blood clot that forms in a patient's left ventricle is likely to be ejected from the heart into the blood stream. Once in the blood stream, the clot can travel anywhere in the body, but may make its way to the brain and cause a stroke.

III. The Standard of Care

The standard of care applicable to the treatment of ischemic stroke patients is well-settled.

A. Secondary Stroke Prevention

The evidence conclusively established that patients who have suffered a stroke are at elevated risk of having another stroke, and that the standard of care calls on a doctor treating a stroke patient to take steps to reduce this risk. This process is generally referred to as "secondary stroke prevention." Counsel for the Farleys used a demonstrative exhibit that set forth five "rules" for doctors in the capacity of treating stroke patients. The first of these rules stated that a doctor should try to prevent a second stroke in a patient

who presents with a stroke. Over the course of the trial, every single expert witness stated that he agreed with this rule.

B. The Diagnostic Process

Often, as here, the first physician to encounter a patient following a stroke is an emergency room doctor. To successfully engage in secondary stroke prevention, the emergency room doctor must orchestrate a diagnostic process (often referred to by the expert witnesses as a diagnostic "workup") to identify the cause of the patient's stroke. The standard of care calls on the doctor to utilize a series of tests and to involve a series of specialists in this process.

As an initial matter, the doctor should order a computed tomography scan ("CT scan") to obtain imaging of the patient's brain. This imaging will allow the doctor to assess whether a stroke has occurred and whether the stroke was ischemic or hemorrhagic. It will also allow the doctor to identify the severity of the stroke, as well as the location of the stroke within the brain. Finally, a CT scan may allow the doctor to identify the approximate period of time that the stroke took place.

The standard of care also calls on the doctor to order an imaging study known as a computed tomography angiogram ("CTA").

A CTA is a scan designed to evaluate the arteries in a patient's head and neck to look for the presence of atherosclerotic plaque. The presence of atherosclerotic plaque may be an indication to the doctor that the patient has suffered a thrombotic stroke.

The doctor should also order a series of tests to assess the patient's heart. An abnormally functioning heart may be an indication to the doctor that the patient has suffered an embolic stroke resulting from a cardioembolic blood clot. The first of these tests is known as electrocardiogram ("EKG"). An EKG measures the electrical impulses in the heart and can detect the occurrence of a recent heart attack or other anomaly.

The second test of the heart is known as an echocardiogram. Two types of echocardiograms were discussed at trial: a transthoracic echocardiogram ("TTE"), and a transesophageal echocardiogram ("TEE"). The TEE and the TTE are both echocardiograms, and they share similar acronyms, but they are significantly different tests. A TEE is an invasive procedure that involves sedating the patient and using a probe, inserted orally and into the esophagus, to view the heart from the interior of the chest cavity. Because a TEE views the heart from the rear, it tends to produce superior imaging of the posterior portions of the heart. A TTE, on the other hand, is

an echocardiogram that uses technology similar to an ultrasound, and is administered by holding a transducer above the patient's chest, which produces a visual image of the heart. Unlike the TEE, the TTE views the heart from the front, and therefore tends to produce superior imaging of the anterior portions of the heart. The parties dispute whether the TEE or the TTE is the superior test, but the evidence clearly established that the standard of care calls on doctors to order at least one of these echocardiograms promptly following the patient's first stroke.

Next, the standard of care calls on the doctor to assess the patient for atrial fibrillation, which, as noted previously, is a disorder that can lead to blood clots forming in a patient's heart. Atrial fibrillation occurs when electrical signals to the heart are disrupted, causing the upper chambers of the heart to quiver, instead of beating normally and rhythmically. This can result in decreased circulatory efficiency and may put the patient at risk of a cardioembolic blood clot.

To test patients for atrial fibrillation, doctors often prescribe the use of a device known as a Holter monitor. A Holter monitor is a portable heart monitoring device that a patient may wear continuously for extended periods of time. The use of a Holter monitor over a period of several days (or even

several weeks) is important. There was much discussion at trial about the difficulty of diagnosing atrial fibrillation. The evidence established that this difficulty stems from the fact that atrial fibrillation is often episodic, meaning that a patient may exhibit symptoms at one point in time, but not another. One of the Farleys' expert witnesses, Dr. Rutledge, drew an analogy to a set of railroad tracks. Dr. Rutledge testified that simply because a passerby does not happen to see a train at one point in time does not mean that a train did not pass by previously, or that one would not pass by in the future. Thus, the extended use of the Holter monitor increases the likelihood that it will detect evidence of atrial fibrillation.

Finally, the standard of care calls on an emergency room doctor treating a stroke patient to engage the services of both a cardiologist and a neurologist to assess the patient. These specialists bring to bear particularized knowledge of the brain and the cardiovascular system to ensure that the patient receives an accurate diagnosis of the cause of his stroke, and to ensure that he receives appropriate preventative treatment. Separately, the emergency room doctor should take steps to ensure that the patient's primary care provider ("PCP") is made aware of the stroke and is integrated into the patient's treatment.

The involvement of a cardiologist, a neurologist, and the PCP is relevant to a concept known as "continuity of care." The treatment of stroke patients generally requires a team approach, involving the emergency room physicians who initially treat the patient, a cardiologist, a neurologist, and the patient's PCP. There was widespread agreement among the expert witnesses that the involvement of all of these doctors increases the likelihood that the patient will be treated properly, that a single physician will coordinate his care, and that, consequently, the patient will have a better outcome.

Because the stroke diagnostic process involves the administration of multiple tests, and the involvement of multiple doctors, the standard of care generally calls for stroke patients to be admitted to the hospital. Multiple expert witnesses testified that doing so serves to facilitate the information-gathering process by ensuring that test results are gathered efficiently, and that experts are promptly engaged and consulted.

In sum, when a patient presents to the emergency room after suffering an ischemic stroke, the standard of care calls on the treating physician to promptly order the following tests (in no particular order): a CT scan, a CTA, an EKG, and an echocardiogram (whether a TTE or a TEE). The doctor should also

consider the use of a Holter monitor to test the patient for atrial fibrillation. In addition, the doctor should promptly engage the services of a cardiologist and a neurologist to evaluate the patient, and the doctor should contact the patient's PCP to make him aware of the stroke and to ensure the continuity of the patient's care. To facilitate this diagnostic process, the doctor should have the patient admitted to the hospital.

C. Treatment

In most cases of ischemic stroke, the treating physician will be able to determine the cause of the patient's stroke by using the diagnostic process outlined above. As noted, except in rare cases, the stroke will either have been a thrombotic stroke resulting from atherosclerotic plaque in the arteries leading to the brain, or an embolic stroke resulting from a blood clot that formed in the patient's heart and swept through the bloodstream to the brain. The thoroughness and accuracy of the diagnostic process is critical, because a physician's prescribed course of treatment for secondary stroke prevention will differ significantly based on the cause of the patient's first stroke.

i. The Basics of Aspirin Versus Coumadin

Two drugs, Aspirin and Coumadin, are commonly used in secondary stroke prevention.[3] Aspirin belongs to a class of drugs known as antiplatelet agents. Aspirin works to "thin" the blood by preventing blood platelets from binding to one another. As a general matter, Aspirin is considered to be effective as a means of preventing blood clots from forming in the arterial circulation. Thus, if a patient is deemed to be at risk of a thrombotic stroke (meaning a stroke resulting from atherosclerotic plaque in the arteries), the patient may be prescribed Aspirin.

Coumadin belongs to a class of drugs known as anticoagulants. Coumadin prevents clotting proteins in the blood from binding together. As a very general matter, Coumadin is considered to be effective at preventing blood clots from forming in the heart in certain circumstances. Thus, a patient deemed to be at risk of a cardioembolic stroke may be prescribed Coumadin, depending on the situation and a long list of patient-specific risk factors.

[3] Coumadin is a brand name version of a drug known as Warfarin; they are identical in composition and function. The terms Warfarin and Coumadin were used interchangeably at trial, but this memorandum and order will use the term Coumadin to refer to Warfarin and Coumadin alike.

Although Coumadin and Aspirin are both used in secondary stroke prevention, they function differently and are intended to treat different causes of stroke. Thus, the decision to treat a patient with Aspirin versus Coumadin is an important one. Several of the Farleys' expert witnesses offered helpful and persuasive testimony about the science underlying the formation of blood clots in the arteries and in the heart, and about how Aspirin or Coumadin can alleviate these problems.

ii. How Aspirin Works

Dr. Stein testified that when an individual has atherosclerotic plaque in the arteries leading to the brain, it raises the potential for blood clot formation. Dr. Stein explained that a small piece of the plaque may become slightly detached, causing blood platelets to flock to this area in order to seal the newly-formed opening. These platelets can bind together and form a blood clot, which may then break away and travel through the bloodstream to the brain.

Dr. Stein explained that Aspirin is generally the accepted treatment for patients who have suffered strokes resulting from atherosclerotic plaque. Aspirin works to "thin" the blood by preventing blood platelets from binding to one another, and thus

it prevents clots from forming in areas where a piece of atherosclerotic plaque has broken away.

iii. How Coumadin Works

Coumadin is intended to serve a very different function. There was widespread agreement among the expert witnesses that Coumadin is ineffective at preventing strokes caused by atherosclerotic plaque. Rather, Coumadin is intended to treat blood clots that can form inside the heart in certain circumstances. Several of the Farleys' expert witnesses explained how Coumadin can remedy this situation.

Above, the court outlined the process through which asymmetrical weakening of a patient's heart can prompt the formation of blood clots in areas of slow or stagnant blood flow. Dr. Charash explained that Coumadin prevents blood clots from forming by suppressing the "chemical chain reaction" that occurs in these areas.

Dr. Stein added further detail by explaining the chemical processes through which pooled or stagnant blood will prompt the formation of blood clots. Dr. Stein testified regarding the role of clotting proteins. These proteins serve a vital function. For example, when an individual suffers a cut to the skin, clotting proteins serve to seal the cut, preventing

further blood loss and infection. However, Dr. Stein explained that clotting proteins can also bind together and cause a blood clot in areas where there is stagnation or pooling of blood.

Dr. Frey offered similar testimony. He testified regarding the presence of 13 types of protein molecules in the blood that interact to form what he described as a "spiderweb net" in areas where blood flow has slowed. Dr. Frey explained that this spiderweb will often form the basis of a blood clot.

Drs. Charash, Stein, and Frey offered persuasive testimony that Coumadin is highly effective in blocking the chemical process that causes the clotting proteins to bind together. Thus, Coumadin is the preferred drug to treat patients who have a blood clot in the heart, or who are at risk of forming a clot in the heart, because Coumadin will dissolve existing clots and prevent new ones from forming.

iv. The Widely-Accepted Medical Guidelines Recommend Coumadin for Ischemic Stroke Patients At Risk of Cardioembolic Blood Clots

For patients who have suffered an ischemic stroke, there is a set of widely-used guidelines on which doctors rely in deciding whether to treat the patient with Aspirin or Coumadin. These so-called Guidelines for Prevention of Stroke in Patients

With Ischemic Stroke or Transient Ischemic Attack ("Guidelines") were a central focus of the trial testimony.

The Guidelines are promulgated by the American Heart Association and the American Stroke Association. The evidence offered by both parties established that the Guidelines are the definitive source of information for doctors treating ischemic stroke patients, and the court views the Guidelines as important in understanding the applicable standard of care.[4]

The Guidelines contain a section titled "Medical Treatments for the Patient with Cardiogenic Embolism." This section advises doctors on whether to treat stroke patients with Aspirin or Coumadin depending on the nature of the stroke and the other symptoms that the patient may be exhibiting. The introductory language of this section is extremely important. In relevant part, this language states:

> In general, patients with cardiac disease and [stroke] face a high risk of recurrent stroke. Because it is often difficult to determine the precise mechanism [of the patient's first stroke], the choice of a platelet inhibitor [Aspirin] or anticoagulant drug [Coumadin] may be difficult. Patients who have suffered an ischemic stroke who have a high-risk source of

[4] In 2010, when these events occurred, the then-current version of the Guidelines was the 2006 edition. Later, in 2011, an updated version of the Guidelines was released. References herein to the "Guidelines" refer to the 2006 edition.

> cardiogenic embolism should generally be treated with anticoagulant drugs to prevent recurrence.

See Pl.'s Ex. 43 at 12 (emphasis added).

Following the introductory language, there is a series of subsections specific to particular symptoms that a stroke patient may be exhibiting. Each subsection gives a specific recommendation as to whether the patient should be treated with Aspirin or Coumadin. The first three subsections, A, B, and C, were frequently discussed at trial. At later points, this memorandum and order will return to a discussion of the Guidelines and the specific subsections. For present purposes, however, the court notes the importance of the introductory language, which plainly directs doctors treating ischemic stroke patients at high risk of cardioembolic blood clot formation to treat the patient with Coumadin.

v. The Relevant Studies Show the Effectiveness of Coumadin Over Aspirin in Preventing Cardioembolic Stroke

The Guidelines reach their recommendations by distilling the latest medical data and research. The available clinical trials are reviewed and compiled to provide specific recommendations and to inform best practices.

The Farleys introduced into evidence a series of studies and clinical trials that are cited in the Guidelines. These

studies and trials attempted to draw conclusions about the effectiveness of Aspirin and Coumadin by tracking stroke patients and recording their incidences of death and stroke recurrence. Most all of these studies and trials concluded that Coumadin is more effective than Aspirin at improving outcomes for stroke patients at risk of cardioembolic blood clots.

The following table summarizes the relevant studies and their outcomes:

Study	**Conclusion**
Anticoagulants in the Secondary Prevention of Events in Coronary Thrombosis Study ("ASPECT I")	"We conclude that the long-term anticoagulation treatment after [heart attack] in low-risk patients has a limited effect on mortality but achieves substantial benefit by reducing the risk of cerebrovascular events and recurrent [heart attack]."
Anticoagulants in the Secondary Prevention of Events in Coronary Thrombosis Study-2 ("ASPECT II")	"In patients with recently admitted acute coronary events, treatment with high-intensity oral anticoagulation or aspirin with medium-intensity oral anticoagulation was more effective than aspirin on its own in the reduction of subsequent cardiovascular events and death."
Warfarin/Aspirin Study in Heart Failure ("WASH Study")	"There were trends to a worse outcome among those randomized to aspirin for a number of secondary outcomes. Significantly more patients randomized to aspirin

	were hospitalized for cardiovascular reasons, especially worsening heart failure."
Warfarin Versus Aspirin for Reduced Cardiac Ejection Fraction ("WARCEF Study")[5]	"In the entire patient population, there was a constant and significant benefit with [Coumadin] as compared to aspirin with respect to rate of ischemic stroke."
Warfarin, Aspirin or Both After Myocardial Infarction	"In this study, we found a statistically significant superiority of [Coumadin] in combination with aspirin, as well as [Coumadin] alone as compared with aspirin for the reduction in the composite end point."
Ventricular Dysfunction and the Risk of Stroke After Myocardial Infarction	"Our study suggests that the beneficial effects of anticoagulation on the rate of stroke after [heart attack] is evidenced not only in patients with moderate to severe decreases in left ventricular ejection fraction, but also patients with relatively well-preserved left ventricular function."

[5] At the time that the 2006 edition of the Guidelines was published, the WARCEF Study was ongoing, but had not yet been completed. The results of the WARCEF Study were later released in 2012. Thus, the WARCEF Study results were not available at the time that these events took place. The court has considered the WARCEF Study for the limited purpose of assessing causation, but has not considered it for purposes of determining the standard of care in place at the time of Mr. Farley's strokes.

vi. The Expert Testimony Also Suggested that Coumadin is More Effective than Aspirin in Preventing Cardioembolic Stroke

The weight of the expert testimony affirmed the recommendation set forth in the Guidelines that ischemic stroke patients who are at high risk of cardioembolic blood clots should be treated with Coumadin. Dr. Charash offered uncontroverted testimony that when these patients are placed on Coumadin therapy, the risk of stroke drops by approximately 50% in 48 hours, and by about 95% within four days.

D. The Standard of Care in Review

To briefly summarize, the standard of care applicable to the diagnosis and treatment of ischemic stroke patients is generally well-settled. The doctor treating the patient must initiate a comprehensive diagnostic "workup" to determine the cause of the patient's stroke. The thoroughness and accuracy of the workup is essential to ensure effective secondary stroke prevention. This workup will typically entail a CT scan, a CTA, an EKG, and an echocardiogram. It may also involve the use of a Holter monitor. The treating emergency room physician is responsible for involving a cardiologist, a neurologist, and the patient's PCP, in order to ensure continuity of care. Depending on the nature of the facility at which treatment is taking

place, completing the diagnostic workup may require admitting the patient to the hospital.

If it is determined that the patient's first stroke was a thrombotic stroke, meaning a stroke resulting from the buildup of atherosclerotic plaque in the arteries leading to the brain, Aspirin is generally the appropriate course of treatment. If, however, it is determined that the patient is at high risk of a cardioembolic blood clot, the patient should generally be treated with Coumadin. Treating such a patient with Coumadin will significantly improve the likelihood of a positive outcome.

IV. Mr. Farley's Treatment at the Manchester VA

A. Preliminary Background Information

Mr. Farley, presently 60 years old, is a veteran of the United States Navy. Mr. Farley sustained service-related injuries to his left arm in 1974. In January of 2000, he was deemed permanently and totally disabled by the United States Department of Veterans Affairs based on these injuries.

Mr. and Mrs. Farley married in 1982. They have three children: George Farley (age 31); James Farley (age 25); and Kimberly-Rae Farley (age 23). Mr. and Mrs. Farley had been separated for approximately six years at the time of Mr. Farley's strokes because of discord related to Mr. Farley's use

of narcotics. For at least a portion of this period, Mr. Farley lived with his sister in Bennington, New Hampshire. Mr. Farley also may have had a girlfriend at some point during this time. Nevertheless, the evidence suggested that Mr. and Mrs. Farley did not have plans to divorce, and were hoping to reconcile. Despite his separation from Mrs. Farley, Mr. Farley maintained relationships with his children during this time.

Since the late 1990s, Mr. Farley had sought treatment at the Manchester VA for an assortment of medical issues, including issues related to the service injury to his left arm. In recent years, Mr. Farley's care was principally overseen by Dr. Armando Del Rio, his PCP.

B. The First Stroke – Initial Symptoms

On the morning of October 20, 2010, Mr. Farley called the Manchester VA and reported that, for the past two days, he had been suffering from a migraine headache and loss of right-sided peripheral vision in both eyes. The Manchester VA scheduled Mr. Farley for an appointment to see an optometrist that afternoon.

Shortly thereafter, Mr. Farley called back to report that he could not attend the appointment because he could not get a ride from his home to the Manchester VA. Mr. Farley indicated that he would report to the Manchester VA the following day.

C. October 21, 2010 Visit

i. Preliminary Evaluation

At 10:35 a.m. on the morning of October 21, 2010, Mr. Farley presented to the Manchester VA, where he again reported that he was suffering from a severe headache and that he had lost right-sided peripheral vision in both eyes. Mr. Farley described the headache as occurring in recent days, and reported that it was causing him pain on a scale of eight out of ten.

Mr. Farley was seen by Dr. Gary Lamphere in the Urgent Care Clinic. Mr. Farley explained that, approximately four days earlier, he had been attempting to move a 50-pound television when it slid and struck him in the head, causing his neck to hyperextend. At trial, Dr. Lamphere testified that Mr. Farley's symptoms, a severe headache and loss of right-sided peripheral vision, were consistent with someone who had suffered a recent stroke.

Dr. Lamphere first referred Mr. Farley for an optometry consultation. A Manchester VA optometrist diagnosed Mr. Farley as suffering from new onset incongruous right homonymous hemianopsia (or a loss of the right half of the visual field), a finding typically associated with the occurrence of a stroke.

ii. CT Scan

Convinced that Mr. Farley had suffered a stroke, Dr. Lamphere then ordered a CT scan of Mr. Farley's brain. The CT scan revealed "poor gray-white discrimination and decreased attenuation with effacement of the sulci in the posterior medial left occipital lobe consistent with a subacute infarct." In other words, the CT scan showed that Mr. Farley had suffered a stroke in the rear, lower-left portion of his brain. That the stroke was deemed to be "subacute" meant that it had likely occurred several days prior. Dr. Lamphere testified that he was also able to glean from the CT scan that Mr. Farley's stroke was an ischemic stroke.

As noted, the CT scan revealed that Mr. Farley's stroke had occurred in the rear, lower-left portion of his brain. A series of arteries carries oxygenated blood from the heart to the brain. The vertebral arteries and the basilar artery run up the back of the neck and supply blood to the rear portions of the brain. The carotid arteries run up the front of the neck and supply blood to the front portions of the brain. The CT scan revealed to Dr. Lamphere that a blood clot had traveled through the arteries in the back of Mr. Farley's neck and had become lodged in the basilar artery, blocking the flow of blood to the

rear, lower-left portion of Mr. Farley's brain, and resulting in an ischemic stroke.

iii. CTA Exam

Next, Dr. Lamphere ordered that Mr. Farley undergo a CTA. Mr. Farley's CTA revealed that the vertebral arteries and the basilar artery were generally normal in appearance. The CTA did reveal, however, "a small amount" of atherosclerotic plaque in Mr. Farley's left carotid artery.

Dr. Lamphere testified at trial that the results of the CTA convinced him that the arteries in Mr. Farley's head and neck were "most likely" not the source of the stroke. Although the CTA did reveal a "small amount" of atherosclerotic plaque in the carotid artery, Dr. Lamphere testified that he was "fairly convinced" that atherosclerotic plaque was not the cause of the stroke. Dr. Lamphere noted that this level of atherosclerotic plaque in a man of Mr. Farley's age was not surprising.

iv. Contemplated Transfer to the West Roxbury VA

During the course of the afternoon on October 21, 2010, Dr. Lamphere contemplated transferring Mr. Farley from the Manchester VA to the Veterans Administration Medical Center in West Roxbury, Massachusetts ("West Roxbury VA"). The West Roxbury VA is a tertiary care facility capable of admitting

patients for monitoring and treatment. The evidence established that had Mr. Farley been transferred to the West Roxbury VA, he likely would have been admitted to the hospital, and likely would have been evaluated by a neurologist.

In preparing to transfer Mr. Farley, Dr. Lamphere completed an inter-facility transfer form and spoke with Dr. Natasha Frank, a physician employed by the West Roxbury VA. Dr. Lamphere obtained Dr. Frank's approval and Mr. Farley's consent to complete the transfer. An ambulance was en route to transport Mr. Farley to Massachusetts when, for reasons that are unclear, Dr. Lamphere cancelled the transfer.

The evidence suggested that the decision to cancel the transfer was made amidst confusion at the Manchester VA. Dr. Lamphere testified that he received a telephone call from Dr. Frank advising him that if Mr. Farley's CTA produced normal results, the transfer would be unnecessary. However, the parties stipulated that Dr. Frank has no memory of this conversation, and that it would not have been her usual practice to advise against a transfer in those circumstances. Furthermore, Dr. Lamphere conceded that his receiving such a call from Dr. Frank was a "very unusual situation." Ultimately, it is unclear why Dr. Lamphere elected to cancel the transfer.

v. EKG

Finally, later in the afternoon on October 21, 2010, Dr. Lamphere ordered an EKG for Mr. Farley. The EKG produced normal results.

vi. Dr. Lamphere Did Not Determine the Cause of Mr. Farley's Stroke

Dr. Lamphere's treatment notes from the October 21, 2010 visit state as follows: "Subacute left occipital CVA [cerebral vascular accident], ? etiology . . . R/O [rule out] cardiac source of embolic [cerebral vascular accident]." These notes suggest that Dr. Lamphere had reached the conclusion that Mr. Farley had suffered a subacute stroke in the left, rear portion of his brain, but that Dr. Lamphere was uncertain as to its etiology, or cause. The notes further imply that Dr. Lamphere suspected that the stroke might have resulted from a blood clot that had formed in Mr. Farley's heart.

The treatment notes comport with Dr. Lamphere's testimony at trial. Dr. Lamphere testified that despite running the CT scan, the CTA, and the EKG, he was uncertain about the cause of Mr. Farley's stroke. Dr. Lamphere was "fairly convinced" that the arteries in the head and neck had not been the source of the stroke. Dr. Lamphere suspected, but was not sure, that Mr. Farley's stroke had resulted from a cardioembolic blood clot.

Indeed, he testified that a cardioembolic blood clot was "high" on his list of potential causes.

Yet, despite his uncertainty regarding the cause of Mr. Farley's stroke, Dr. Lamphere did not pursue a series of diagnostic steps called for by the standard of care which could have helped him narrow the possibilities. First, Dr. Lamphere could have prescribed the use of a Holter monitor to evaluate Mr. Farley for atrial fibrillation. Dr. Lamphere also could have promptly ordered an echocardiogram to assess Mr. Farley's heart. Dr. Lamphere admitted at trial that he did nothing to determine whether Mr. Farley might have been able to undergo an echocardiogram that day. Instead, Dr. Lamphere arranged for Mr. Farley to undergo the test at a much later date.

Dr. Lamphere could have promptly engaged a cardiologist in Mr. Farley's care. Dr. Lamphere conceded at trial that a doctor treating a stroke patient should attempt to rule out the heart as the source of the patient's stroke. As Dr. Lamphere explained, a patient who has suffered a stroke resulting from a cardioembolic blood clot is generally at high risk of a subsequent stroke because the ongoing conditions in the patient's heart may cause another clot to form. Dr. Lamphere admitted at trial that he was aware as of October 21, 2010, that the Manchester VA had a cardiologist on staff. Indeed, Dr.

Lamphere acknowledged that this cardiologist, Dr. Daniel Lombardi, had an office "literally just a hallway down from [] the Urgent Care Clinic" where Dr. Lamphere was practicing. Nevertheless, despite both his concern that the source of Mr. Farley's stroke was cardioembolic and the ease of promptly engaging a cardiologist, Dr. Lamphere testified that he did not consult with Dr. Lombardi, nor did Dr. Lamphere arrange for Dr. Lombardi to examine Mr. Farley that day.

Likewise, Dr. Lamphere could have arranged for Mr. Farley to be seen by a neurologist. Dr. Lamphere testified that a neurologist was on staff and available at the Manchester VA on October 21, 2010. Nevertheless, Dr. Lamphere did not engage the neurologist's services for Mr. Farley.

Finally, Dr. Lamphere could have arranged for Mr. Farley to be admitted to the hospital. Dr. Lamphere testified that had he done so, Mr. Farley likely would have been seen by both a cardiologist and a neurologist. These specialists, Dr. Lamphere conceded, have specific expertise treating stroke patients.

Despite not knowing the precise etiology of Mr. Farley's stroke, but strongly suspecting a cardioembolic cause, and despite not pursuing the various diagnostic avenues available to him, Dr. Lamphere discharged Mr. Farley in the late afternoon on October 21, 2010. Mr. Farley was instructed to take two baby

Aspirin daily to prevent stroke and to return to the Manchester VA if his symptoms worsened. He was told that the Manchester VA's cardiology department would contact him to schedule an echocardiogram.

Later that day, Dr. Lamphere ordered a TEE for Mr. Farley. A series of mishaps related to the TEE ensued. As an initial matter, Dr. Lamphere testified that his usual practice under the circumstances would have been to order the TEE to take place within one week. However, Dr. Lamphere failed to note this timeframe on the TEE order, and the TEE was scheduled for November 18, 2010, almost one month after Mr. Farley initially sought treatment. Dr. Lamphere candidly conceded at trial that the timing of the TEE was the result of an "apparent mistake" on his part.

Then, for reasons that are not entirely clear, Dr. Lamphere cancelled the TEE. Dr. Lamphere theorized at trial that the TEE may have been inadvertently cancelled due to a mistake he may have made in entering the order through the Manchester VA's computer system. The TEE was only later rescheduled for November 18 when Mr. Farley brought the issue to the attention of a Manchester VA nurse.

D. November 18, 2010 Visit

Mr. Farley arrived at the Manchester VA on November 18, 2010, for the TEE. As instructed, Mr. Farley had not eaten that day, and had arranged for a driver to take him to and from the appointment because he would be sedated for the procedure. However, after Mr. Farley arrived, it was determined that the probe necessary to conduct the TEE was not functioning properly. Instead of administering the TEE, Dr. Lombardi, the Manchester VA cardiologist, administered a TTE, the echocardiogram conducted by holding a transducer above the patient's chest.

The TTE revealed that Mr. Farley's heart was functioning abnormally. Specifically, it found that Mr. Farley's left ventricle was dilated, that Mr. Farley was suffering from hypokinesis with severe hypokinesis of the inferior and basal inferolateral walls of his heart, and that Mr. Farley's ejection fraction was 30-35%.

To briefly summarize, the left ventricle is one of four chambers of the human heart and it is responsible for pumping oxygenated blood to the body. Mr. Farley's TTE showed that his left ventricle was dilated, or enlarged, and that two of the walls of the left ventricle – the inferior wall and the basal inferolateral wall – were exhibiting signs of a recent heart attack in that they were moving abnormally. In other words, Mr.

Farley was suffering from asymmetrical weakening of his heart because these two walls were significantly weakened relative to other areas of the heart. Finally, the ejection fraction is a measure of the percentage of blood in the heart that the heart ejects with each beat. An ejection fraction of 65-70% is considered normal, so Mr. Farley's ejection fraction of approximately 30-35% was abnormally low.

Dr. Lombardi testified that he called Dr. Del Rio, Mr. Farley's PCP, with the results of the TTE shortly after it was performed. Dr. Lombardi testified that "[he] contacted [Dr. Del Rio] that afternoon and [] made him aware of the findings and particularly the fact that [Mr. Farley's] ejection fraction was found to be reduced." Dr. Lombardi testified further that Dr. Del Rio told him that he planned to relay the results of the TTE to Mr. Farley at their next appointment. According to Dr. Lombardi, Dr. Del Rio indicated that he preferred to discuss the results with Mr. Farley in person.

There is no evidence in the record to corroborate Dr. Lombardi's testimony that any such conversation occurred.[6] Dr.

[6] For his part, Dr. Del Rio took the position that he was entirely unaware that Mr. Farley had suffered a stroke at all. Dr. Del Rio stated during his deposition that at no point did he have "any information about [Mr. Farley] with regard to . . . how he was doing and so forth."

Lombardi conceded at trial that he did not make a written note of the conversation with Dr. Del Rio in the medical records. Incredibly, when asked why he had not done so, Dr. Lombardi disavowed any responsibility for Mr. Farley's care, explaining that he opted not to make a written note of the telephone call "because [he] really wasn't in the capacity of treating Mr. Farley." The court finds that Dr. Lombardi's testimony about speaking with Dr. Del Rio was not credible, and that no such conversation took place.

Despite having gathered and reviewed the troubling results of Mr. Farley's TTE, Dr. Lombardi discharged Mr. Farley, and did not schedule him for any further care.

E. December 1, 2010 Visit

Mr. Farley next visited the Manchester VA nearly two weeks later, on December 1, 2010, for a routine visit with his PCP that had been scheduled prior to his stroke. He was first seen in the urgent care center for seemingly unrelated pain in his right hand. Afterward, Mr. Farley was seen by his PCP, Dr. Del Rio.

To determine what occurred at the December 1, 2010 visit, the court must necessarily rely on Dr. Del Rio's treatment notes, as well as a written transcript of Dr. Del Rio's

deposition offered in evidence by the government.[7] This is because Dr. Del Rio was unavailable to testify at trial. Based on the parties' representations, it appears that Dr. Del Rio was aware of the dates of the trial, but nevertheless scheduled an international trip during the same period of time.

Having viewed a portion of Dr. Del Rio's deposition, and having read the full deposition transcript, the court concludes that Dr. Del Rio was generally not a credible witness. His deposition testimony is often nonresponsive and evasive, an impression enhanced when considered in light of Dr. Del Rio's decision to render himself unavailable to appear at trial.

Dr. Del Rio's notes from the December 1 visit suggest that he discussed with Mr. Farley the troubling results of the TTE. The notes also suggest that Mr. Farley told Dr. Del Rio that he had not been taking Atenolol and Crestor, medications previously prescribed to him to lower his blood pressure and cholesterol levels, because Mr. Farley did not believe that he needed them. It is not apparent from Dr. Del Rio's notes whether Mr. Farley indicated that he was, or was not, taking the Aspirin that Dr. Lamphere had prescribed. However, Dr. Del Rio did write that

[7] A short video excerpt of Dr. Del Rio's deposition was shown at trial.

"education [was] given about importance of takng (sic) meds regulalry (sic) and also to ake (sic) asa (sic) daily."

At this appointment, Dr. Del Rio issued Mr. Farley new prescriptions for Atenolol (blood pressure), Crestor (cholesterol), Vitamin B12, and Aspirin. He also scheduled Mr. Farley for a further cardiology workup, which was to take place on December 16, 2010.

Dr. Del Rio's notes give no indication that he was aware that Mr. Farley had suffered a stroke. The notes do mention Dr. Del Rio's belief that the TTE results were indicative of a recent "cardiac event," but Dr. Del Rio makes absolutely no mention of a stroke. And, as noted previously, Dr. Del Rio took the position during his deposition that he was entirely unaware that Mr. Farley had suffered a stroke at all.

One of the government's own expert witnesses, Dr. Manning, concluded that Dr. Del Rio was wholly unaware that Mr. Farley had suffered a stroke. Dr. Manning testified that, based on his review of the record, there was no indication that Dr. Del Rio was aware of the stroke as of Mr. Farley's December 1, 2010 appointment.

The court finds that, incredibly, Dr. Del Rio was unaware as of December 1, 2010, that his patient, Mr. Farley, had suffered a serious stroke approximately six weeks earlier.

Although the Farleys do not seek a finding that Dr. Del Rio violated the standard of care, the court notes that Dr. Del Rio bears much of the blame for his own ignorance. A cursory review of Mr. Farley's recent medical records prior to the December 1, 2010 visit would have revealed the details of Mr. Farley's treatment at the Manchester VA on October 21, 2010.

What is more, Dr. Del Rio's electronic signature was recorded on a nurse's note on October 20, 2010, the day on which Mr. Farley first called the Manchester VA to report his symptoms of headache and loss of peripheral vision. The nurse's note on which Dr. Del Rio's electronic signature appears indicates the nurse's belief that Mr. Farley was at risk of a stroke. At a bare minimum, signing this note should have called Dr. Del Rio's attention to Mr. Farley and the potential that he had suffered a stroke.

F. December 2, 2010 – The Second Stroke

On December 2, 2010, the day after his appointment with Dr. Del Rio, Mr. Farley was found unresponsive in his home. Mr. Farley was taken to the Elliot Hospital in Manchester, New Hampshire, where he was diagnosed as having suffered a massive stroke in the basilar artery, the same region of the brain in which his first stroke had occurred. As a result of this second

stroke, Mr. Farley is paralyzed and suffers from locked-in syndrome, meaning that he is fully cognizant, but has the ability to control only minor movements of his eyes and head.

Since his second stroke, Mr. Farley has required extensive medical treatment, and has resided at several different assisted-living facilities in Massachusetts and New Hampshire. The evidence established that Mr. Farley has received suboptimal care at these facilities. For example, at one of the facilities, Mr. Farley developed grade-four pressure sores, meaning that the sores extended through skin, fat, and muscle, all the way to the bone. Mr. Farley has also not been given adequate range-of-motion physical therapy, resulting in the painful shortening and constricting of the muscles in his arms, legs, and hands (a condition known as "contractures").

V. Findings Regarding the Cause of Mr. Farley's First Stroke

Based on the expert testimony and the medical records, the court finds it more likely than not that Mr. Farley's first stroke was caused by a cardioembolic blood clot, meaning a blood clot that formed in his heart, and traveled through his blood stream to the brain. The court bases this finding on the following facts.

A. Mr. Farley's CTA Ruled Out Atherosclerotic Causes of the First Stroke

To begin, Mr. Farley's first stroke was almost certainly either a thrombotic stroke caused by atherosclerotic plaque in his arteries, or an embolic stroke caused by a blood clot that formed in his heart. The court finds that Mr. Farley's CTA was sufficient to rule out a thrombotic stroke.

The specific results of Mr. Farley's CTA are contained in the medical records. They state in relevant part:

> Each vertebral artery is normal in appearance. The basilar artery is normal. Each common carotid artery is normal in appearance. There is a small amount of atherosclerotic plaque at the left carotid bulb.

Both of Mr. Farley's strokes occurred in the rear portion of his brain, which receives oxygenated blood from the heart via the vertebral and basilar arteries. The carotid arteries, on the other hand, transport blood to the front portions of the brain. Thus, to be clear, the atherosclerotic plaque that was detected on the CTA was in a different artery (the carotid artery) than the rear arteries (the vertebral and basilar arteries) that supply blood to the posterior portions of the brain where Mr. Farley's strokes occurred.

Although Mr. Farley's CTA did reveal "a small amount of atherosclerotic plaque" in the left carotid artery, the Farleys' expert witnesses all adamantly concluded that atherosclerotic

plaque was not the cause of Mr. Farley's first stroke. Dr. Charash testified that "[w]ithin a reasonable medical certainty [the CTA] showed there was no primary disease in the [] blood vessels . . . going to the brain, which meant that this was not a primary brain circulation stroke." Dr. Frey concurred. He testified that the CTA revealed that "[Mr. Farley's] arteries were clean and it was a good study . . . ." Dr. Stein testified that the CTA "came back normal . . . ."

Dr. Rutledge's testimony on the CTA findings was particularly persuasive. In describing the CTA results, Dr. Rutledge testified as follows:

> [Mr. Farley] has minimal plaque . . . the origin of the great vessels are clear. There's no significant atherosclerotic disease in the aorta that would be a contributing factor to [the] stroke. . . . [B]ased on the imaging findings we know it's not the vessels in the head or neck . . . . All those are normal.

This testimony was compelling not only because it was detailed and unequivocal, but also because Dr. Rutledge was arguably the most qualified of any of the expert witnesses to interpret the CTA results. Dr. Rutledge is a neurointer-ventional surgeon, meaning that he specializes in image-guided surgeries of the head and neck. He is also board certified in a field known as neuroradiology, which is a subspecialty of diagnostic radiology, and which deals specifically with imaging

of the head and neck. Thus, the court was highly convinced by Dr. Rutledge's testimony that the CTA effectively eliminated atherosclerotic plaque as the cause of Mr. Farley's first stroke.

While the Farleys' expert witnesses were all on the same page regarding the CTA findings, the government's expert witnesses were far less consistent. As an initial matter, Drs. Kim and Greer appeared to agree with the Farleys' experts that the CTA revealed a low probability that the clot resulted from atherosclerotic plaque. Dr. Kim stated during his deposition that the CTA "revealed no narrowings of arteries in the head or neck that would explain his symptoms. So his neck vessels were patent. . . . It made the possibility of atherosclerotic disease less likely."[8] Dr. Greer took a similar position. He testified on direct examination that it was reasonable to assume based on the results of the CTA that "there was no significant pathology in the arteries of the neck and the head that might explain the stroke[.]"

Dr. Manning disagreed. Dr. Manning testified that while the CTA "essentially cleared" the arteries in Mr. Farley's head and neck, it was still possible that there was atherosclerotic

[8] "Patent" is a medical term used to describe a vessel that is open. Stedman's Medical Dictionary 1441 (28th ed. 2006).

plaque in Mr. Farley's aorta – the main artery leaving the heart – that would not have been detected on the CTA. Dr. Manning based this opinion on the fact that atherosclerotic plaque had been detected in Mr. Farley's left carotid artery. Dr. Manning opined that "[w]hen you have plaque in one place . . . you'd find plaque in many different places." According to Dr. Manning, because Dr. Lamphere had not obtained imaging of Mr. Farley's aorta, it was impossible to rule out atherosclerotic causes of Mr. Farley's first stroke.

Dr. Caplan seemed to agree with Dr. Manning. On cross examination, Dr. Caplan was asked whether the CTA results were sufficient to rule out atherosclerotic causes of Mr. Farley's first stroke. Citing the fact that the CTA did not visualize the aorta, Dr. Caplan replied that no, "I don't think you could rule it out." Further questioning revealed, however, that Dr. Caplan had testified during his deposition that the CTA did, in fact, rule out atherosclerotic causes. Dr. Caplan is, of course, entitled to change his mind, but the inconsistency undermined his credibility on this particular issue.

In sum, six of the eight expert witnesses testified that the CTA ruled out atherosclerotic plaque as the cause of Mr. Farley's first stroke. The dissenters were Drs. Manning and Caplan. Importantly, neither of them took the position that the

CTA indicated an atherosclerotic cause. Rather, they merely suggested that the CTA could not conclusively rule out atherosclerotic plaque as the cause of the stroke because Dr. Lamphere had not also obtained imaging of Mr. Farley's aorta. And, as noted, Dr. Caplan had previously opined that he believed that the CTA did, in fact, rule out atherosclerotic causes.

Further supporting the conclusion that the CTA was sufficient to rule out atherosclerotic causes of Mr. Farley's first stroke is the fact that the government essentially stipulated to this effect. Prior to the start of trial, in accordance with the local rules of this court, the parties each submitted a final pre-trial statement. See LR 16.2(b)(2). Both final pre-trial statements contained identical versions of what the parties described as a "brief statement of the case," which contained a series of stipulated facts. In relevant part, the parties stipulated that "[a CTA] of the head and neck showed all arteries essentially normal in appearance. This suggested to Dr. Lamphere that restriction of the blood flow was most likely not from atherosclerotic blockage of the head and neck arteries or a clot originating from such plaque . . . ." See Def. United States of America's Final Pre-trial Statement, doc. no. 17 at 1-2; see also Pl.'s Pre-trial Statement, doc. no. 18 at 2.

For all of these reasons, the court finds that the results of Mr. Farley's CTA indicate that his first stroke was not a thrombotic stroke resulting from atherosclerotic plaque. The overwhelming weight of the expert testimony, coupled with the government's own pre-trial stipulation, support this finding.

B. The TTE Findings Indicated a Cardioembolic Source

As described above, Mr. Farley underwent a TTE on November 18, 2010, which was administered by Dr. Lombardi. Dr. Lombardi's written findings are contained in the medical records, and state in relevant part:

> The left ventricle is mild to moderately dilated in the end-diastolic and systolic dimensions. The ejection fraction is visually estimated to be 30-35%, and there is global hypokinesis with severe hypokinesis of the inferior wall and basal inferolateral wall.

As noted previously, the left ventricle is the chamber of the heart that is responsible for pumping oxygenated blood to the body. Mr. Farley's TTE revealed that his left ventricle was dilated, or enlarged.

The ejection fraction measures the percentage of blood that the heart ejects with each beat. A normal ejection fraction is approximately 65-70%. Thus, Dr. Lombardi's estimation of Mr. Farley's ejection fraction at 30-35% suggests that Mr. Farley was well below the normal range.

Finally, Dr. Lombardi noted that Mr. Farley's heart was exhibiting "global hypokinesis" with "severe hypokinesis" of two of the walls of the left ventricle. The term hypokinesis refers to "diminished or slow movement." Stedman's Medical Dictionary 934 (28th ed. 2006). Thus, Dr. Lombardi's note indicates that Mr. Farley's heart was generally exhibiting diminished or slow movement, and that this diminished or slow movement was particularly pronounced in two of the walls of the left ventricle.

The weight of the evidence established that these conditions put Mr. Farley at heightened risk of cardioembolic blood clot formation. On this issue, Dr. Charash's testimony was particularly helpful and persuasive.

Dr. Charash was unequivocal in his belief that the TTE findings conclusively established that Mr. Farley's stroke was cardioembolic in nature. On direct examination, Dr. Charash stated the following:

> [W]hen you're doing an echocardiogram on a patient who had a stroke and you are trying to figure out the mechanism and you . . . find to your surprise that the patient has a 30-35% ejection fraction from a previously silent heart attack with a segmental wall motion abnormality, that's as close to medical certainty as you can have that the heart had a clot in it that broke off because that's the money shot. That's a gigantic finding. It has major repercussions.

The court found Dr. Charash to be a highly persuasive and credible expert witness. His extensive work treating stroke patients imbued his testimony with a high degree of practical experience and wisdom. Dr. Charash spoke on both direct and cross examination in terms that were thorough, yet understandable. And, it should be noted that Dr. Charash was one of just two cardiologists who testified as expert witnesses in this case.

Drs. Rutledge, Frey, and Stein joined the conclusion offered by Dr. Charash that the TTE results established that Mr. Farley's first stroke was almost certainly cardioembolic. On direct examination, Dr. Rutledge was asked how he knew that a cardioembolic blood clot was responsible for Mr. Farley's first stroke. Dr. Rutledge responded that "when [Mr. Farley] had his TTE, we basically saw the underlying issues with his asymmetric heart motion, his low ejection fraction, that were a likely cause of his clots."

Dr. Frey was also asked to interpret the TTE results. He responded as follows:

> I think the salient finding is that this ventricle fits the prototype, if you will, for the ventricle that is prone to forming clots . . . . Partly because the overall ejection fraction is diminished indicating that blood in general isn't moving as fully as it should with each heartbeat, but specifically, there is, quote, severe hypokinesis of the inferior wall and

> the basal inferolateral wall. . . . And this focal area of injury in the inferior wall and the basal inferolateral wall is the type of injury, or hypokinesia, that makes a patient more prone to forming a clot.

Dr. Stein also agreed. Dr. Stein testified that Mr. Farley "had part of the heart muscle that was damaged that was not squeezing as well." As a result, Dr. Stein opined, "we know [the clot] came from the heart."

The four expert witnesses who testified on behalf of the Farleys were remarkably consistent with one another in their assessment of the TTE results. Each of them convincingly concluded that the asymmetrical weakening of Mr. Farley's heart, combined with the decreased ejection fraction, established a high likelihood that Mr. Farley's first stroke was caused by a cardioembolic blood clot.

On the issue of the TTE results, the Farleys' experts were joined by Dr. Kim, a government expert. In his deposition, Dr. Kim was asked to discuss the TTE findings, and he stated the following:

> [Mr. Farley] had an echocardiogram that showed that the [left ventricle] of his heart was not functioning at normal capacity. Namely that it was dilated and not pumping blood as sufficiently. . . . So he had changes in the movement of his heart that suggested that . . . his heart was not pumping blood well. . . . [T]here is an association between lower ejection fraction . . . and clot formation in the ventricles.

> So this would have placed him at increased risk of having stroke or having clot formation in the heart.

The only meaningful opposition to the testimony that Mr. Farley's TTE results indicated a cardioembolic source of the first stroke came from Dr. Manning, the government's expert cardiologist. Dr. Manning disputed the view shared by the Farleys' experts that Mr. Farley's TTE results showed that he was at high risk of a cardioembolic blood clot. Dr. Manning did so by drawing a diagram of the left ventricle, and explaining that Mr. Farley's "severe" hypokinesis was not in the area of the left ventricle where one would expect to see a blood clot develop. Furthermore, Dr. Manning opined that Mr. Farley's wall motion abnormality was not at the level of severity that is typically associated with clot formation. Finally, Dr. Manning testified that although Dr. Lombardi had visually estimated Mr. Farley's ejection fraction to be 30-35%, he had run Mr. Farley's TTE results through a system at Beth Israel Hospital and found that Mr. Farley's ejection fraction was actually 40%, a level that Dr. Manning believed did not put Mr. Farley at high risk of forming a blood clot.

The court gave careful consideration to the testimony of Dr. Manning, as he was one of only two cardiologists to testify as an expert witness. Ultimately, however, the court assigns

little weight to Dr. Manning's testimony that Mr. Farley's TTE results were not indicative of a cardioembolic stroke. His testimony on this point was contrary to that of Dr. Charash, as well as Drs. Stein, Rutledge, and Frey, each of whom the court found to be extremely persuasive and credible. What is more, Dr. Manning was adamant that Mr. Farley's stroke was caused by atherosclerotic plaque. For the reasons explained above, however, Mr. Farley's CTA was sufficient to rule out atherosclerotic plaque as the cause of the first stroke, and Dr. Manning's insistence on this theory undermined his credibility on the issue of the TTE results.

For all of these reasons, the court finds that Mr. Farley's TTE results were strongly indicative of a cardioembolic source of his first stroke.

C. The Recency of Mr. Farley's Heart Attack Suggests a Cardioembolic Source

In addition to the diagnostic evidence obtained through the CTA and the TTE, both of which strongly suggested that Mr. Farley's first stroke resulted from a cardioembolic blood clot, further support for this conclusion is the evidence that Mr. Farley's heart attack was more likely than not a recent event that preceded the stroke by a matter of months rather than years. By way of background, Dr. Lombardi testified, and the

parties agreed, that Mr. Farley's severe hypokinesis of two of the walls of his left ventricle was the result of a heart attack. In other words, it was undisputed that a heart attack had caused those two walls of the left ventricle to begin moving abnormally.

The timing of Mr. Farley's heart attack did not appear to be a particular point of contention throughout most of the trial. In fact, the parties had stipulated that "[t]he results of [the] TTE also suggested that Mr. Farley may have had [] a recent heart attack." See Def. United States of America's Final Pre-trial Statement, doc. no. 17 at 2 (emphasis added).

A central tenet of Dr. Charash's testimony was his contention that the segmental wall motion abnormalities in Mr. Farley's heart had led to blood clot formation, which in turn caused the first stroke. Dr. Charash's theory was that the asymmetrical weakening of Mr. Farley's heart, originally caused by a heart attack, had allowed blood to stagnate and pool, which resulted in the formation of a blood clot.

Dr. Charash's theory implicitly relied on the premise that Mr. Farley's heart attack had occurred relatively recently prior to his first stroke. After all, if the heart attack had happened much earlier, then the conditions that Dr. Charash testified led to the formation of blood clots would have been

present much earlier, begging the question of why Mr. Farley's stroke had not occurred long before. When asked how long the conditions in Mr. Farley's heart had persisted prior to the first stroke, Dr. Charash testified that "in all likelihood it was relatively recent because . . . generally the first six months to a year [after a heart attack] is when you have the highest risk for a stroke . . . ."

The timing of Mr. Farley's heart attack became an issue only during Dr. Manning's testimony. Dr. Manning argued that a cardioembolic cause was less likely because he believed that the medical records demonstrated that Mr. Farley's heart attack had occurred sometime prior to 2003. Dr. Manning supported this theory by pointing to an EKG that Mr. Farley had undergone in November 2003, which showed "possible" evidence of a heart attack.

Ultimately, however, there is insufficient support in the record for Dr. Manning's theory, and the court finds that Mr. Farley's heart attack did occur sometime shortly before the first stroke. As an initial matter, Dr. Manning himself conceded that he could not be sure that Mr. Farley had, in fact, suffered a heart attack prior to 2003. After pointing to what he described as evidence of a possible heart attack in Mr.

Farley's 2003 EKG, Dr. Manning conceded that "[a]n EKG is not very specific. And it wasn't a definite [heart attack]."

What is more, Drs. Rutledge and Charash offered credible evidence to refute Dr. Manning's theory, even though that theory had not yet been raised when they testified. Dr. Rutledge testified that the heart attack occurred "in and around" the time of the first stroke, as evidenced by a subsequent EKG performed after Mr. Farley's second stroke in February 2011 which showed that the conditions in Mr. Farley's heart had improved. Dr. Rutledge interpreted this as evidence that Mr. Farley's heart attack had occurred shortly before the first stroke, and that his heart had time to heal before the February 2011 EKG. Dr. Charash offered similar testimony. He argued that because Mr. Farley's left ventricle had shown signs of improvement following the second stroke, this was an indication that the heart attack was relatively recent, and that it was beginning to heal.

For these reasons, the court rejects Dr. Manning's contention that Mr. Farley's heart attack took place in 2003 or earlier, and finds that Mr. Farley's heart attack took place more recently and closer in time to his first stroke. This finding was supported by the record evidence, and by the

government's own pre-trial stipulation that the heart attack was "recent."[9]

D. The Government's Expert Witnesses Offered Inconsistent and Non-Credible Theories on the Source of the Stroke

Curiously, the four expert witnesses who testified on behalf of the government offered at least three completely different explanations of the likely cause of Mr. Farley's first stroke. As described above, Dr. Kim appeared to take the position that Mr. Farley's TTE results indicated that his first stroke was likely caused by a cardioembolic blood clot.

Dr. Greer offered an entirely different explanation. Dr. Greer opined that Mr. Farley's strokes may have been the result of a dissection. A dissection is a tear that occurs in the wall of one of the arteries leading to the brain. Following a dissection, blood begins to clot in the area of the tear in order to prevent further bleeding, much like what occurs when an

[9] Counsel for the government seemed to come to the realization during trial that the stipulation may have been a mistake. After Dr. Manning opined that the heart attack occurred prior to 2003, the following exchange occurred:

Government Counsel: So if I, in my ignorance, had stipulated with plaintiff's counsel that [Mr. Farley] had had a recent [heart attack], would that be correct?

Dr. Manning: I don't believe he did. No, I don't believe the evidence that we have demonstrates he had a recent [heart attack].

individual suffers a cut to the skin. In a dissection, this clot can break away and travel further up the artery to the brain, causing a stroke.

Dr. Greer's suggestion that Mr. Farley may have suffered a dissection was based in large part on the fact that Mr. Farley reported having been struck in the side of the head with a television several days before he experienced symptoms of his first stroke. This incident caused his neck to hyperextend. Dr. Greer opined that the hyperextension might have resulted in a dissection. At the conclusion of Dr. Greer's testimony, the court asked him whether he believed it more likely that Mr. Farley's stroke had been caused by a cardioembolic blood clot, or by a dissection. Dr. Greer responded: "For me, I favor slightly higher in terms of the dissection. . . . [F]or me my gut sense is that's more likely what happened here."

For two reasons, the court finds that Dr. Greer's testimony on this issue was not persuasive. First, Dr. Greer's dissection theory was directly and convincingly refuted by another government expert, Dr. Caplan. Dr. Caplan testified that he "disagree[d]" with Dr. Greer, and that it was "extremely unlikely" that a dissection had caused Mr. Farley's stroke. When asked to elaborate, Dr. Caplan testified that the occurrence of Mr. Farley's second stroke in the same region of

the brain as his first stroke drastically diminished the likelihood that a dissection was to blame. Dr. Caplan explained that even if a dissection had caused the first stroke, the theory would not explain Mr. Farley's second stroke, because a dissection would be highly unlikely to result in a stroke more than a full month after the dissection had occurred.

Second, Dr. Greer himself conceded that a dissection was highly unlikely because Mr. Farley's CTA was nearly certain to detect a dissection if one was present. Dr. Greer described the CTA as "99.9 . . . percent effective for detecting [a dissection]." For these reasons, the court rejects Dr. Greer's testimony that Mr. Farley's first stroke was caused by a dissection.

Dr. Manning offered yet another theory as to the cause of Mr. Farley's first stroke. As outlined above, Dr. Manning testified that Mr. Farley's CTA was insufficient to rule out atherosclerotic plaque because it did not produce images of Mr. Farley's aorta. Because the CTA showed atherosclerotic plaque in the carotid artery, Dr. Manning believed it likely that Mr. Farley also had atherosclerotic plaque in the aorta, which could have caused the stroke.

To support this contention, Dr. Manning noted that only approximately 2% of blood flow from the heart makes its way to the arteries in the back of the brain where both of Mr. Farley's strokes occurred. Thus, the odds that a single cardioembolic clot would make its way to the arteries in the back of the brain are approximately 50 to 1. The odds of two cardioembolic clots traveling to this same area of the brain are even slimmer – approximately 2,500 to 1 (0.02 x 0.02 = 0.0004).

Dr. Manning explained it this way: "You're looking at two percent of your blood. Why would a random blood clot [] twice go into that same region? It would be very, very unusual."

Dr. Manning was not the only expert witness to point out the improbability of two cardioembolic blood clots making their way to the posterior circulation of the brain. Dr. Greer testified as follows:

> If the stroke were to come from the heart and it's definitively a cardioembolic source, I would expect the strokes to go to different vascular distributions and not to the posterior circulation where the minority of the blood flow goes. Why is the embolism so smart every time to go to the posterior circulation? That seems quite ironic to me.

Dr. Caplan offered similar testimony:

> I'm struck really again by the posterior circulation where that's been my life's interest. That's really been what I've been involved in, and it's very unusual for a cardiac origin and embolus to two times go to the back and not go anywhere to the front. . . . It's

> still not at all clear that this stroke came from the heart. It may have, but it would be very, very unusual to have those things happen, to go to the back, and to have it happen twice and not have anything in the front . . . .

This testimony from Drs. Manning, Greer, and Caplan was compelling because it identified the inherent improbability that two cardioembolic blood clots would make their way to a portion of the brain that receives just a fraction of the blood flow from the heart. The court wrestled with this testimony a great deal. Ultimately, however, for three distinct reasons, the court concludes that the testimony is in conflict with the prevailing weight of the evidence.

First, Dr. Caplan, himself a proponent of this improbability theory, ultimately concluded that the strokes were most likely cardioembolic in nature. After he had testified that it was "very, very unusual" for cardioembolic blood clots to cause two strokes in the posterior circulation of the brain, Dr. Caplan was asked on cross examination whether he believed, to a reasonable degree of medical certainty, that both of Mr. Farley's strokes had been caused by cardioembolic blood clots. Dr. Caplan responded as follows: "I think that's somewhat more likely . . . but it's not a 90/10. It may be something like 55/45, 60/40."

In other words, Dr. Caplan was fully aware of the improbability of two cardioembolic strokes occurring in the posterior circulation, yet he still concluded that there was a 55-60% likelihood that both of Mr. Farley's strokes were cardioembolic.

Dr. Caplan's concession on this point was very influential. The court found Dr. Caplan to be a highly credible witness. His testimony struck the court as forthright, and the court found it admirable that Dr. Caplan, a neurologist, frequently demurred in responding to complex questions about cardiology, indicating that he would defer on those matters to a cardiologist. What is more, Dr. Caplan was uniquely qualified to opine on the posterior circulation, which Dr. Caplan described as his "life's interest." Of note, Dr. Caplan testified that he has published two books specifically addressing posterior circulation stroke.[10]

Second, Dr. Manning's insistence that atherosclerotic plaque in the aorta was to blame does not comport with the court's understanding of the testimony regarding the physiology of the heart. The expert witnesses described the aorta as the sole point at which oxygenated blood leaves the heart and enters

[10] If there was any doubt regarding his qualifications, Dr. Caplan quite literally wrote the book on stroke. The fifth edition of Caplan on Stroke is forthcoming. Dr. Greer also described Dr. Caplan as "one of [his] heroes."

the circulatory system. If this is true - and the court has no reason to believe otherwise – then the odds of a piece of atherosclerotic plaque making its way from the aorta to the posterior circulation are equally as low as the odds that a cardioembolic blood clot would take the same path. That is to say, if all of the blood that leaves the heart must travel through the aorta, then the chances of two pieces of atherosclerotic plaque and two cardioembolic blood clots both traveling to the basilar and vertebral arteries are identical.

Unfortunately, the improbability argument emerged late in the trial as something of an afterthought. It was initially offered by Dr. Manning on cross examination, and further developed only upon further questioning of Dr. Manning by the court. The improbability argument was not raised in the pre-trial briefing, nor was it put to the Farleys' expert witnesses, who had already completed their testimony by the time it emerged. As a consequence, the court could not benefit from a more thorough exploration of the issue by the expert witnesses.

Finally, the improbability argument raised by Drs. Manning, Greer, and Caplan is in direct conflict with pre-trial stipulations offered by the government which suggested that the government believed the clot to be cardioembolic. The parties' joint stipulated set of facts stated, in relevant part:

> A [CTA] of the head and neck showed all arteries essentially normal in appearance. This suggested to Dr. Lamphere that restriction of the blood flow was most likely not from atherosclerotic blockage of the head and neck arteries or a clot originating from such plaque, but instead the blockage likely came from a clot originating in or flowing through the heart, or what's known as cardioembolic in nature.

See Def. United States of America's Final Pre-trial Statement, doc. no. 17 at 1-2 (emphasis added).

True, the stipulation merely states that the CTA "suggested to Dr. Lamphere" that the stroke was cardioembolic. Conceivably, the government might have taken the position that Dr. Lamphere was incorrect and that there was another explanation for the stroke. However, a review of the government's pre-trial proposed findings of fact makes clear that the government's pre-trial theory of the case was that Mr. Farley's stroke was caused by a cardioembolic blood clot. Those pre-trial proposed findings invite the court to find that "[t]he findings of the November 18, 2010 TTE provide reasonable medical grounds for determining that the October stroke more probably than not was caused by a cardioembolism . . . ."[11] See United States' Proposed Findings of Fact and Conclusions of Law, doc. no. 22 at ¶ 72.

[11] That the government stipulated to a cardioembolic cause similarly weighs against Dr. Greer's dissection theory.

The First Circuit has noted that "[f]act stipulations . . . speed up the trial process by eliminating the need for proving essentially uncontested facts, which helps preserve precious judicial resources. So, obviously, stipulations of this sort are valued by litigants and judges alike, and once freely-made they bind the parties, the trial court, and the appellate court too." Rodríguez v. Señor Frog's de la Isla, Inc., 642 F.3d 28, 34-35 (1st Cir. 2011) (citations omitted) (internal quotation marks omitted); see also Chem. Leaman Tank Lines, Inc. v. Aetna Cas. & Sur., 71 F. Supp. 2d 394, 396 (D.N.J. 1999) ("[A]bsent an express limitation or a clear manifestation of intent to the contrary, pretrial stipulations remain binding between parties during subsequent proceedings.").

The Farleys were entitled to rely, and did rely, on the government's pre-trial stipulation that Mr. Farley's first stroke was cardioembolic in nature. Counsel for the Farleys addressed this issue in his closing argument, when he noted that the cause of Mr. Farley's strokes "isn't really a matter of controversy in this case." Counsel correctly stated that "[the Farleys] ought to be able to rely . . . after two-plus years of litigation [on the stipulation]."

For these reasons, the court rejects the improbability theory offered primarily by Dr. Manning, and concludes that Mr.

Farley's first stroke was caused by a cardioembolic blood clot that formed in his heart and traveled through his blood stream to the brain. This finding was supported by the diagnostic evidence gathered during the CTA and the TTE. And, it was reinforced by the consistent and nuanced testimony offered by the Farleys' expert witnesses, particularly when contrasted with the inconsistent and non-credible alternative theories offered by the government.

VI. The Standard of Care Applicable to Mr. Farley

Above, the court described the standard of care applicable to ischemic stroke patients generally. For some ischemic stroke patients, a physician's choice of whether to treat the patient with Aspirin or Coumadin may be a difficult one. However, for Mr. Farley, an ischemic stroke patient at high risk of a cardioembolic blood clot, the standard of care plainly called for him to be treated with Coumadin to prevent a second stroke.

The government's principal objective at trial was to convince the court that the standard of care applicable to Mr. Farley called for a prescription of either Aspirin or Coumadin. In advancing this theory, the government relied heavily on the Guidelines for the treatment of ischemic stroke patients. Throughout the course of the trial, the expert witnesses

repeatedly drew the court's attention to three subsections of the Guidelines, Subsections A, B, and C, each of which is relevant to the treatment of ischemic stroke patients with particular symptoms.

Subsection A is relevant to ischemic stroke patients with atrial fibrillation. The Guidelines state that these patients should be treated with Coumadin. As will be described below, however, Mr. Farley almost certainly did not suffer from atrial fibrillation, and thus Subsection A does not apply.

Subsection B is relevant to patients who have undergone an echocardiogram that visualized the presence of a blood clot in the left ventricle. For patients in this subcategory, the Guidelines recommend treatment with Coumadin. However, because Mr. Farley's TTE did not visualize the presence of a blood clot in the left ventricle, Subsection B does not apply either.[12]

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[12] There was extensive expert testimony suggesting that, like atrial fibrillation, left ventricular blood clots are difficult to diagnose because they are episodic. A blood clot may form at one point in time, be ejected from the heart, only to have a new clot form again. Like Dr. Rutledge's atrial fibrillation railroad track analogy, simply because a left ventricular blood clot is not present at one point in time does not mean that one was not present in the past, or that one will not form in the future.

The government took a somewhat ironic position on this issue. The government was adamant that Subsection B did not apply because Mr. Farley's TTE did not visualize a left ventricular blood clot. Of course, the TTE was administered only after an extensive delay, and was administered in lieu of a

The final subsection, Subsection C, relates to a condition known as cardiomyopathy. In Subsection C, the Guidelines state that "[f]or patients with ischemic stroke . . . who have dilated cardiomyopathy, either [Coumadin] or [Aspirin] therapy may be considered for prevention of recurrent events . . . ." The government's theory at trial was that Mr. Farley suffered from dilated cardiomyopathy, and was thus appropriately categorized in Subsection C. The government contended that, despite the many shortcomings in the care provided by Mr. Farley's doctors, it was reasonable under Subsection C, and therefore within the standard of care, to treat Mr. Farley with either Aspirin or Coumadin.

There was much discussion at trial regarding the clinical definition of dilated cardiomyopathy. There was general agreement among the expert witnesses that cardiomyopathy refers broadly to disease of the heart muscle. There was also agreement that Mr. Farley's TTE had shown dilation (or enlargement) of the left ventricle. Thus, it appeared that most of the expert witnesses agreed at a basic level that Mr. Farley was suffering from dilated cardiomyopathy. There was

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TEE because the Manchester VA's TEE probe was inoperable. Without belaboring the point, the court notes that perhaps a timelier echocardiogram, or a TEE administered in lieu of, or in addition to, the TTE might have visualized a left ventricular blood clot. This is, and will remain, an unknown.

disagreement, however, regarding the applicability of the recommendations set forth in Subsection C to Mr. Farley, given the specific condition of his heart.

Testifying for the government, Drs. Greer, Manning, Caplan, and Kim all agreed that Mr. Farley was suffering from dilated cardiomyopathy, as evidenced by the TTE findings. For example, Dr. Greer testified that Mr. Farley's severe hypokinesis of two of the walls of his left ventricle meant that he was suffering from cardiomyopathy, and was "exactly the type of patient" described in Subsection C. Given this dilated cardiomyopathy diagnosis, and the indication in Subsection C regarding the efficacy of either Aspirin or Coumadin, the government's expert witnesses took the position that it was within the standard of care to prescribe Aspirin to Mr. Farley.

The Farleys' expert witnesses took a more nuanced and, in the court's view, a far more credible and persuasive approach. They argued that cardiomyopathy is inherently a broad term, and that doctors treating patients suffering from cardiomyopathy must consider the patient's particular circumstances before deciding between Aspirin and Coumadin.

Earlier, the court discussed Dr. Charash's differentiation between symmetrical and asymmetrical weakening of a patient's heart. The conclusion that Dr. Charash offered is that

asymmetrically weakened hearts like Mr. Farley's are at higher risk of clot formation than symmetrically weakened hearts because the asymmetry allows blood to stagnate and pool.

In discussing Subsection C, Dr. Charash acknowledged that it calls for the prescription of Aspirin or Coumadin. But, he suggested, the term "cardiomyopathy" refers to a uniform or symmetrical weakening of the heart, and therefore Subsection C does not adequately account for a patient like Mr. Farley with asymmetrical weakening. Dr. Charash testified that the standard of care calls on a treating physician to delve into the patient's particular circumstances, rather than merely concluding that the patient has some form of cardiomyopathy and arbitrarily deciding between Aspirin and Coumadin.

Dr. Charash then circled back to the introductory language of the Guidelines, and argued that even if Mr. Farley was appropriately categorized in Subsection C, he should have received Coumadin. Dr. Charash testified as follows:

> So the point is if you have a patient where the risk isn't really high of a clot, you may have to make a decision between [Aspirin and Coumadin], and there are some people where it could be one or the other. But then [the Guidelines] say very specifically if it's high risk source for a cardioembolic stroke, it's not the same debate. Symmetrically weakened hearts are less likely to form a clot, and based on the details of the case, you have to make a decision whether or

> not it's more likely they threw a clot from the heart. In this case it's the only reasonable possibility . . . .

Dr. Charash was joined by Drs. Rutledge and Frey, both of whom offered compelling testimony that it was an oversimplification to conclude that Mr. Farley was suffering from dilated cardiomyopathy, and that therefore either Aspirin or Coumadin therapy would have been appropriate under the Guidelines. Dr. Rutledge testified that it "mischaracterize[d]" Mr. Farley to simply conclude that he had cardiomyopathy, because Mr. Farley "also ha[d] the focal wall defect which [was] a progenitor for the clots." Dr. Frey offered similar testimony. He argued that Subsection C did not apply to Mr. Farley, because it "didn't specifically deal with what was going on in his heart which was a focal area of cardiac wall dysfunction."

Ultimately, Drs. Charash, Rutledge, and Frey did not appear to dispute the premise that Mr. Farley suffered from dilated cardiomyopathy, and that Subsection C was therefore of some relevance. However, their testimony convincingly established that the standard of care requires a treating physician to make an informed decision between Aspirin and Coumadin therapy for a patient with dilated cardiomyopathy. It is simply not enough to conclude that a patient has dilated cardiomyopathy, and then to arbitrarily prescribe either Aspirin or Coumadin without

evaluating the patient's level of risk for cardioembolic blood clot formation.

A final consideration informs the court's finding that the standard of care requires an individualized Aspirin versus Coumadin determination, even for patients with dilated cardiomyopathy. Each subsection of the Guidelines sets forth a treatment recommendation, and each treatment recommendation is accompanied by a confidence rating that indicates the conclusiveness of the medical evidence underlying the recommendation. For example, a Class I, Level A confidence rating represents the highest rating, and indicates "general agreement that the procedure or treatment is useful and effective," and that the underlying data was "derived from multiple randomized clinical trials."

The recommendation for either Aspirin or Coumadin therapy set forth in Subsection C is assigned the second-lowest confidence rating of Class II(b), Level C. This indicates that the recommendation is based on medical evidence that is "less well established," and that the underlying data is based merely on "expert opinion or case studies," rather than clinical trials. At a minimum, this low confidence rating should give doctors pause, and flag for them the importance of making an informed decision between Aspirin and Coumadin.

The court ultimately rejects the government's contention that, based on the guidance set forth in Subsection C, treatment with either Aspirin or Coumadin was equally appropriate for Mr. Farley. Because Mr. Farley had previously suffered an ischemic stroke and was found to be at high risk of a cardioembolic blood clot, the general rule (stated in the introduction to the Guidelines) applied in Mr. Farley's case. In short, the standard of care called for him to be prescribed Coumadin.

Legal Standards

The FTCA vests the district courts with exclusive jurisdiction to hear "civil actions on claims against the United States, for money damages . . . for injury or loss of property, or personal injury or death caused by the negligent or wrongful act or omission of any employee of the government while acting within the scope of his office or employment . . . ." 28 U.S.C. § 1346(b)(1). As the parties have stipulated, the employees of the Manchester VA who treated Mr. Farley were federal employees acting within the scope of their employment.

The substantive law of the State of New Hampshire governs this lawsuit. Gonzalez-Rucci v. United States I.N.S., 539 F.3d 66, 69 (1st Cir. 2008). "In any action for medical injury, the plaintiff shall have the burden of proving by affirmative

evidence . . . (a) [t]he standard of reasonable professional practice in the medical care provider's profession or specialty thereof, if any, at the time the medical care in question was rendered; and (b) [t]hat the medical care provider failed to act in accordance with such standard; and (c) [t]hat as a proximate result thereof, the injured person suffered injuries which would not otherwise have occurred." N.H. Rev. Stat. Ann. § 507-E:2(I); see also Bronson v. Hitchcock Clinic, 140 N.H. 798, 801 (1996).

The standard of care considers "only whether the person against whom the claim is made has acted with due care having in mind the standards and recommended practices and procedures of his profession, and the training, experience and professed degree of skill of the average practitioner of such profession, and all other relevant circumstances." N.H. Rev. Stat. Ann. § 508:13.

"[T]he burden of proof with respect to causation in a medical malpractice case rests and remains with the plaintiff." Wilder v. Eberhart, 977 F.2d 673, 676 (1st Cir. 1992) (applying New Hampshire law). To establish that an injury suffered was caused by a breach of the standard of care, the claimant must establish that the breach was the cause-in-fact, and the legal cause, of the injury. Bronson, 140 N.H. at 801. "Conduct is

the cause-in-fact of an injury if the injury would not have occurred without that conduct." Id. This standard is satisfied if the evidence shows "with reasonable probability, not mathematical certainty, that but for the defendant's negligence, the harm would not have occurred." Id. at 802-03. Proximate, or legal cause "requires a plaintiff to establish that the negligent conduct was a substantial factor in bringing about the harm." Beckles v. Madden, 160 N.H. 118, 124 (2010). "'Although the negligent conduct need not be the sole cause of the injury, to establish proximate cause a plaintiff must prove that the defendant's conduct caused or contributed to cause the harm.'" Id. (quoting Estate of Joshua T. v. State, 150 N.H. 405, 408 (2004)). Proximate cause must be established by expert testimony. N.H. Rev. Stat. Ann. § 507-E:2(I); see also Beckles, 160 N.H. at 125.

Rulings of Law

I. Alleged Violations of the Standard of Care

Mrs. Farley, bringing this suit on behalf of Mr. Farley, alleges that many elements of the Manchester VA's care constituted medical negligence and fell below the standard of care. Specifically, Mrs. Farley contends that:

- Instead of discharging Mr. Farley on October 21, 2010, Dr. Lamphere should have arranged for him to be admitted to the hospital.

- Dr. Lamphere should have scheduled Mr. Farley for an echocardiogram shortly after his October 21, 2010 urgent care visit, rather than almost one month later.

- Dr. Lamphere should have arranged for Mr. Farley to be given a Holter monitor. Mrs. Farley alleges that a Holter monitor should have been used to rule out atrial fibrillation.

- Following Mr. Farley's October 21, 2010 urgent care visit, Dr. Lamphere was negligent in failing to refer Mr. Farley for consultation with a neurologist.

- Dr. Lombardi and his staff were negligent in failing to maintain the equipment necessary to perform a TEE as Dr. Lamphere had originally ordered. In the alternative, Dr. Lombardi should have offered Mr. Farley a TEE after the TTE had taken place, once the equipment had been repaired.

- Drs. Lamphere and Lombardi were negligent in failing to adequately provide for continuity of care.

- Drs. Lamphere and Lombardi were negligent in failing to prescribe Mr. Farley Coumadin.

In short, the court finds that many of these actions (or omissions) individually and collectively violated the standard of care, and resulted in both a failure to adequately diagnose the cause of Mr. Farley's first stroke, and a failure to prevent his second stroke.

The decision to discharge Mr. Farley, rather than to have him admitted to the hospital, and the failure to promptly refer him to a cardiologist and a neurologist, served to deprive Mr. Farley and his doctors of information that should have informed the decision of whether to prescribe Aspirin or Coumadin. And, this problem of a lack of information was compounded by internal failures of communication at the Manchester VA, which deprived Mr. Farley of any semblance of continuity of care. These failures ultimately resulted in Mr. Farley being carelessly prescribed Aspirin instead of Coumadin, a medication that very likely would have prevented his second stroke.[13] The cascading errors in judgment and failures of communication that took place in this case could have – and should have – been prevented.

II. Dr. Lamphere Violated the Standard of Care

As the emergency room doctor who initially treated Mr. Farley, Dr. Lamphere bore the responsibility of orchestrating Mr. Farley's diagnostic evaluation. As described previously, the standard of care called on Dr. Lamphere to order a series of tests, to involve certain specialists and Mr. Farley's PCP, and to ensure the continuity of Mr. Farley's care. With all of the

[13] The court's specific findings with respect to the failure to prescribe Coumadin as the legal and proximate cause of Mr. Farley's harm are located ante at Rulings of Law – Section V.

necessary diagnostic information in hand, Dr. Lamphere should have been responsible for helping to make a decision between Aspirin and Coumadin.

Unfortunately, Dr. Lamphere botched the diagnostic process. He did not have Mr. Farley admitted to the hospital. He failed to consult with a neurologist. He failed to ensure that Mr. Farley's echocardiogram would take place promptly and that the results would be integrated into his treatment. He referred Mr. Farley to a cardiologist, but did so only after an extensive delay that served to undermine the continuity of Mr. Farley's care. And, as a further result of this delay, Dr. Lamphere divorced himself from the decision-making process, meaning that he did not (nor did anyone else) revisit the initial Aspirin prescription in light of Mr. Farley's TTE results. Dr. Lamphere violated the standard of care in five different ways.

A. Failure to Order Holter Monitoring

The Farleys allege that Dr. Lamphere violated the standard of care by failing to prescribe Mr. Farley the use of a Holter monitor to test for atrial fibrillation. There was broad consensus among the expert witnesses that atrial fibrillation is a leading cause of stroke, and that testing for it is an important part of the stroke diagnostic process.

The government effectively conceded this issue. Testifying for the government, Drs. Greer, Caplan, and Manning all opined that Dr. Lamphere should have arranged for Mr. Farley to undergo Holter monitoring in order to evaluate him for atrial fibrillation. For example, Dr. Caplan testified that "it was a mistake not to [prescribe the use of a Holter monitor to test for atrial fibrillation] and not to do that fairly soon afterward . . . ." Based on this testimony, the court finds that Dr. Lamphere's failure to prescribe the use of a Holter monitor to test Mr. Farley for atrial fibrillation violated the standard of care.

B. The Delayed Echocardiogram

The Farleys allege that Dr. Lamphere violated the standard of care by scheduling Mr. Farley's echocardiogram to occur nearly one month after he initially sought treatment for his stroke. There was broad consensus among expert witnesses testifying for both sides that Mr. Farley's echocardiogram (whether a TTE or a TEE) should have been scheduled as quickly as possible. This consensus included all four government experts. For example, Dr. Greer testified that, under the circumstances, the echocardiogram should have been performed "[w]ithin one to two days of the patient's stroke being

detected." The broad consensus was further supported by Dr. Lamphere's own candid admission at trial that scheduling the echocardiogram for nearly one month after Mr. Farley's initial presentation was the result of his "apparent mistake." Based on the clear weight of the expert testimony, the court finds that Dr. Lamphere's failure to promptly schedule Mr. Farley's echocardiogram violated the standard of care.

C. Failure to Admit Mr. Farley to the Hospital

The Farleys contend that Dr. Lamphere's decision to discharge Mr. Farley, rather than arrange for him to be admitted to the hospital, violated the standard of care. The court agrees. By quickly discharging Mr. Farley and opting not to have him admitted, Dr. Lamphere deprived Mr. Farley of an adequate diagnostic workup that could have conclusively identified the cause of his first stroke. This was a violation of the standard of care.

In this case, perhaps the simplest way for Dr. Lamphere to have admitted Mr. Farley to a hospital was for Dr. Lamphere to complete Mr. Farley's transfer to the West Roxbury VA. Prior to trial, the parties stipulated that patients being evaluated for a stroke at the West Roxbury VA are likely to be admitted to the hospital. As noted above, Dr. Lamphere had gone as far as to

complete the paperwork for the transfer, and an ambulance was on its way to pick up Mr. Farley, when the transfer was abruptly cancelled.

It is unclear why Dr. Lamphere elected to cancel Mr. Farley's transfer. Dr. Lamphere's explanation of having cancelled the transfer in consultation with Dr. Frank was directly contradicted by a joint stipulation that Dr. Frank has no memory of consulting with Dr. Lamphere, and would not normally have made a recommendation to cancel a transfer in those circumstances.

When Mr. Farley was discharged from the Manchester VA on October 21, 2010, he had undergone a CT scan, a CTA, and an EKG. At that point, Dr. Lamphere had diagnosed Mr. Farley as having suffered a recent stroke, but he was uncertain where the blood clot that caused the stroke had originated.

Dr. Stein testified that arranging for Mr. Farley to be admitted to the hospital would have facilitated the gathering of information that could have enabled Dr. Lamphere to precisely identify the source of the stroke. According to Dr. Stein, admitting Mr. Farley to the hospital would have enabled prompt consultation with a neurologist, as well as the prompt scheduling of an echocardiogram.

Aside from Dr. Lamphere, Dr. Stein was the sole emergency room physician to testify at trial. In addition to his board certification in emergency medicine, Dr. Stein is also certified in neurocritical care, which uniquely positioned him to opine on both the standard of care applicable to emergency room physicians, and the nuances of Mr. Farley's stroke. On this issue in particular, Dr. Stein's testimony was highly credible.

The testimony of expert witnesses on both sides supports the conclusion that Dr. Lamphere violated the standard of care by failing to have Mr. Farley admitted to the hospital. In addition to Dr. Stein, all of the Farleys' other expert witnesses (Drs. Charash, Frey, and Rutledge) testified that the standard of care required that Dr. Lamphere arrange for Mr. Farley to be admitted to the hospital.

Testifying for the government, Dr. Greer admitted that discharging Mr. Farley was "below [his] standard of what [he] think[s] is appropriate care for a patient." Dr. Caplan agreed. He testified that he "would have preferred for [Mr. Farley] to be in the hospital." In addition, Dr. Kim stated during his deposition that, had Mr. Farley presented to his facility (the University of California San Francisco Stroke Center), Mr. Farley would have "more likely than not [] been admitted."

For these reasons, the court finds that Dr. Lamphere violated the standard of care when he discharged Mr. Farley, rather than having him admitted to the hospital.

D. Failure to Refer Mr. Farley to a Neurologist

The Farleys allege that Dr. Lamphere violated the standard of care when he failed to engage a neurologist to further evaluate Mr. Farley. The overwhelming weight of the evidence supported this allegation.

One of the five "rules" listed on the Farleys' demonstrative exhibit denoting the rules for doctors treating stroke patients stated that a doctor should consult with a neurologist when a patient presents to him after suffering a stroke. Every single expert witness agreed with this rule, and agreed that Dr. Lamphere violated the standard of care by failing to engage a neurologist in Mr. Farley's care.

This broad consensus included all four of the government's expert witnesses. For example, discussing the need for Mr. Farley to see a neurologist, Dr. Greer stated unequivocally that "a patient who had just come in with a diagnosis of a subacute stroke should have been seen by a neurologist . . . ." Dr. Caplan concurred, testifying that "it would have been wisest to consult a neurologist."

On this issue, the court was particularly persuaded by the testimony of Dr. Frey, who, on cross examination, was asked whether the average practitioner should be held to the same standard of care as the renowned experts who testified in this case. Dr. Frey responded that, no, "[h]e just has to know his limits and then know who to call." The standard of care did not impose on Dr. Lamphere the requirement that he be an expert in neurology. But it did impose on Dr. Lamphere the obligation to consult with a qualified neurologist when a patient presented to him with signs of a recent stroke.

For these reasons, the court concludes that Dr. Lamphere's failure to engage a neurologist in Mr. Farley's care was a violation of the standard of care.

E. Failure to Provide Continuity of Care

The court finds next that there was egregiously inadequate sharing of information among medical care providers at the Manchester VA, resulting in a violation of the standard of care. Based on the weight of the evidence, it is the court's finding that Dr. Lamphere shares heavily in the responsibility for this violation.

As an initial matter, Dr. Lamphere failed to adequately integrate Dr. Del Rio, Mr. Farley's PCP, into Mr. Farley's care.

At trial, Dr. Lamphere acknowledged that he was aware as of October 21, 2010, that Dr. Del Rio was Mr. Farley's PCP, but admitted that he did not bring the issue of Mr. Farley's stroke to Dr. Del Rio's attention.

Also troubling is the fact that Dr. Lamphere ordered a TEE for Mr. Farley, but never arranged for the results to be tracked or integrated into Mr. Farley's treatment plan. To illustrate the point, Dr. Lamphere admitted at trial that he had later inadvertently cancelled Mr. Farley's TEE, and he explained that he was uncertain how or why he had done so. As noted earlier, the TEE was only rescheduled after Mr. Farley brought the issue to the attention of Manchester VA staff at a subsequent appointment.

When asked about Dr. Lamphere's failure to follow up on the results of the echocardiogram, Dr. Charash summed up the situation well, when he testified that "[Mr. Farley] was medically abandoned by healthcare professionals because nobody was involved in his stroke diagnostic procedures ever since he left the emergency room. The tests were ordered but no one was following him, or no one was even made aware to follow [the results]." Dr. Stein, himself an emergency room physician, testified that the TTE was "just left to float out there," with

nobody appointed to integrate the results into Mr. Farley's care, or to follow up with him.

Finally, as described above, Dr. Lamphere bears the responsibility for negligently scheduling Mr. Farley's echocardiogram for nearly one full month after he initially presented to the Manchester VA following his first stroke. One effect of this significant delay was to undermine the continuity of Mr. Farley's care.

Dr. Stein testified that part of the responsibility of an emergency room doctor treating a stroke patient involves orchestrating the diagnostic evaluation and consulting with a neurologist and a cardiologist. Once these specialists have been consulted and integrated into the patient's care, Dr. Stein testified, the emergency room doctor will often be involved in the decision of whether to treat the patient with Aspirin or Coumadin.

In this case, Dr. Lamphere inadvertently and negligently divorced himself from Mr. Farley's care. By scheduling Mr. Farley's echocardiogram so far in the future (and by failing to ensure that the results were appropriately tracked and integrated), Dr. Lamphere was not in a position to be involved in decisions about Mr. Farley's treatment because he was seemingly unaware that Mr. Farley's echocardiogram had even

taken place. This contributed to the lack of continuity of Mr. Farley's care.

III. Dr. Lombardi Violated the Standard of Care

As described above, Dr. Daniel Lombardi is employed as a cardiologist at the Manchester VA. He performed Mr. Farley's TTE on November 18, 2010.

Dr. Lombardi violated the standard of care by failing to take steps to ensure that Mr. Farley received adequate continuity of care.[14] As noted previously, the TTE results demonstrated that Mr. Farley's heart was functioning abnormally in that Mr. Farley had a decreased ejection fraction and asymmetrical wall motion abnormalities. These test results should have served as a red flag to Dr. Lombardi, and should have prompted him to take several steps.

[14] The Farleys allege that Dr. Lombardi was negligent in failing to maintain the equipment used to conduct the TEE, and for failing to administer a TEE (after the equipment became operational), particularly in light of the troubling results of the TTE which called for a more precise and ultimately superior method of visualizing a clot in Mr. Farley's left ventricle. With respect to the maintenance of the equipment, the Farleys presented almost no evidence on the question of why the equipment failed or how the failure could have been prevented. With respect to the necessity of a TEE following the TTE, both the Farleys and the government devoted substantial time to this question. Ultimately, however, the court need not address the question as the court finds that Mr. Farley's TTE results were sufficient, by themselves, to indicate that Mr. Farley needed Coumadin therapy.

To start, Dr. Lombardi should have promptly brought the results of Mr. Farley's TTE to the attention of his PCP, Dr. Del Rio, and to the attention of the physician who had ordered the test, Dr. Lamphere.

Next, the TTE results should have prompted Dr. Lombardi to intervene personally in Mr. Farley's care. As a trained cardiologist, Dr. Lombardi was in the best position of any of Mr. Farley's doctors to recognize the troubling results of the TTE. Thus, Dr. Lombardi was in a position to intervene at a critical juncture in Mr. Farley's care and to engage in secondary stroke prevention.

The standard of care plainly calls on a doctor treating an ischemic stroke patient at high risk of a cardioembolic blood clot to prescribe Coumadin. Thus, Dr. Lombardi was obligated under the standard of care to initiate the process of prescribing Coumadin to Mr. Farley, either by doing so himself, or by promptly convening Drs. Lamphere and Del Rio in order to evaluate next steps. Under the standard of care, Dr. Lombardi also bore the responsibility to have Mr. Farley admitted to the hospital, and to involve a neurologist in Mr. Farley's care. Instead, Dr. Lombardi did nothing, and later attempted to justify his inaction with the shocking admission that he believed he "wasn't in the capacity of treating Mr. Farley."

The court finds that by failing to adequately bring the results of Mr. Farley's TTE to the attention of Drs. Del Rio and Lamphere, and by failing to personally intervene in Mr. Farley's care, Dr. Lombardi failed to provide continuity of care.

IV. The Ultimate Breach: The Failure to Prescribe Mr. Farley Coumadin

Before discharging Mr. Farley from the Manchester VA on October 21, 2010, Dr. Lamphere directed Mr. Farley to take two Aspirin tablets daily to prevent a second stroke. There was widespread agreement among the expert witnesses that it is standard practice to prescribe Aspirin in the days immediately following a stroke, and to wait a short period of time before prescribing Coumadin. For example, Dr. Stein testified that prescribing Coumadin too soon after an ischemic stroke can lead to uncontrolled bleeding in the area of the stroke. Thus, a doctor will typically prescribe Aspirin immediately following a stroke, then prescribe Coumadin thereafter if called for under the circumstances.

The violations of the standard of care detailed above combined to have one ultimately catastrophic consequence: because of an inadequate diagnostic workup and a lack of continuity of care, the Manchester VA never revisited Mr. Farley's Aspirin prescription and never reconsidered that

prescription in light of his TTE results. Thus, the Manchester VA never prescribed Coumadin to Mr. Farley as was called for under the standard of care. While all of the violations of the standard of care are significant, the failure to prescribe Coumadin is the breach that ultimately caused Mr. Farley's injuries.

The court has carefully considered each of the violations of the standard of care chronicled above, and has assessed the extent to which those violations contributed to the failure to prescribe Mr. Farley Coumadin. The court finds that both Drs. Lamphere and Lombardi bear responsibility for the fact that Mr. Farley was not prescribed Coumadin as was called for under the standard of care.

A. The Holter Monitor

Although Dr. Lamphere did violate the standard of care by failing to prescribe the use of a Holter monitor to test for atrial fibrillation, the weight of the evidence established that Mr. Farley did not suffer from atrial fibrillation to begin with. Thus, even had Dr. Lamphere prescribed a Holter monitor, it would have been highly unlikely to detect signs of atrial fibrillation. Both Drs. Stein and Rutledge, testifying for the Farleys, conceded that Mr. Farley's extensive medical records do

not show any evidence of atrial fibrillation. These records include the period of time prior to Mr. Farley's second stroke, as well as extensive records from the various facilities to which he was brought thereafter. Therefore, the court finds that although Dr. Lamphere violated the standard of care by failing to prescribe the use of a Holter monitor, this violation did not cause Mr. Farley to suffer any injury.

B. The Delayed Echocardiogram

The court finds that although the results of the echocardiogram likely would have been the same whether it was conducted in October or November of 2010, the delay in administering the echocardiogram nevertheless contributed to the failure to prescribe Mr. Farley Coumadin.

Experts on both sides agreed that the findings of Mr. Farley's TTE likely would have been identical whether the test had been performed on or around October 21, 2010, when Mr. Farley initially presented, or one month later on November 18, 2010, when it was finally conducted. Specifically, two of the Farleys' expert witnesses, Drs. Frey and Stein, agreed that even had the TTE been conducted sooner, the results would have likely been the same.

However, the delay significantly diminished the continuity of Mr. Farley's care. As described above, the standard of care calls on the treating emergency room physician to orchestrate a complex diagnostic process. Once this process is complete, as Dr. Stein explained, the standard of care calls on the emergency room doctor to participate in the decision of whether to treat the patient with Aspirin or Coumadin (in consultation with the cardiologist, the neurologist, and the PCP).

By delaying Mr. Farley's echocardiogram by almost one month, Dr. Lamphere inadvertently removed himself from the decision-making process. Thus, he was seemingly unaware that the TTE had been conducted, and he was never made aware of the specific results. As a consequence, Dr. Lamphere was not involved in making treatment decisions, and Mr. Farley's continuity of care was undermined as a result.

Moreover, as Dr. Charash explained, time is of the essence where the prevention of a second stroke is concerned. It takes four days for a patient on Coumadin to receive the 95% reduction in risk of a subsequent stroke. As of Mr. Farley's November 18, 2010 TTE, he was less than two weeks away from his catastrophic second stroke. Thus, not only did the late TTE disrupt the continuity of care provided to Mr. Farley, but it significantly

narrowed the window of time within which to prevent the second stroke.

C. Hospital Admission and Neurology Consultation

The decisions by Drs. Lamphere and Lombardi not to admit Mr. Farley to the hospital and not to consult a neurologist directly contributed to the failure to prescribe him Coumadin. As described previously, the evidence established that the diagnostic process is significantly improved when patients are admitted to the hospital because doing so allows for the prompt gathering of test results and the prompt consultation of experts. In this case, Dr. Lamphere's decision to discharge Mr. Farley had the direct consequence of delaying his echocardiogram by almost one month, and Dr. Lombardi's failure to admit Mr. Farley eliminated any possibility that he would receive further preventative care prior to the second stroke.

Likewise, the decision not to consult a neurologist contributed to the failure of Mr. Farley's doctors to revisit Dr. Lamphere's initial Aspirin prescription. Every single expert witness agreed that the standard of care calls for a doctor treating a stroke patient to consult a neurologist. One of the reasons for doing so is that the neurologist brings to bear specific expertise on the brain that can inform treatment

decisions. This team-oriented approach increases the likelihood that the patient will have a positive outcome.

In this case, Mr. Farley did not have the benefit of a team approach. Had Dr. Lamphere or Dr. Lombardi engaged a neurologist, however, it would have increased the likelihood that the neurologist would have recognized the clear need for Mr. Farley to be placed on Coumadin therapy.

D. Continuity of Care

The lack of continuity of care at the Manchester VA was a major factor contributing to the failure to prescribe Mr. Farley Coumadin. As described above, breakdowns in communication occurred on multiple levels. Dr. Lamphere failed to notify Dr. Del Rio of Mr. Farley's stroke. Dr. Lombardi failed to notify either Dr. Del Rio or Dr. Lamphere of the dangerous implications of the TTE results. And, not one of Mr. Farley's doctors concerned himself with the question of whether Dr. Lamphere's Aspirin prescription should have been revisited in light of the TTE results.

Ultimately, it seems that each of Mr. Farley's three doctors considered only a small portion of the information relevant to Mr. Farley's case. Dr. Lamphere considered the CT scan, the EKG, and the CTA results. Dr. Lombardi may have

considered the TTE results, but there is no evidence that he was aware of or studied the CT scan, the EKG, or the CTA. And, Dr. Del Rio seems to have reviewed the TTE results, but he was not even aware that Mr. Farley had suffered a stroke. Not one of these doctors saw the complete package.

Had Mr. Farley received appropriate medical care, this information would have been shared among the various treatment providers, and at least one of Mr. Farley's doctors would have likely recognized his need for Coumadin. For this reason, the court finds that the lack of continuity of care attributable to Drs. Lamphere and Lombardi directly contributed to the failure to prescribe Mr. Farley Coumadin.[15]

E. Conclusion

Had Dr. Lamphere followed the standard of care in his diagnostic evaluation, he would have admitted Mr. Farley to the hospital and consulted with a neurologist, and he would have promptly consulted with a cardiologist and promptly arranged for

[15] The court does not find that Dr. Del Rio violated the standard of care, or that he contributed to Mr. Farley's second stroke. For one, the Farleys do not request this finding. And, even if the court were to find that Dr. Del Rio violated the standard of care, the timing was such that Dr. Del Rio's appointment with Mr. Farley took place less than 24 hours before the second stroke. Thus, even if Dr. Del Rio had prescribed Coumadin, the drug would not have had sufficient time in Mr. Farley's bloodstream to significantly reduce the risk of stroke.

Mr. Farley to undergo an echocardiogram. With this diagnostic information at his fingertips, Dr. Lamphere would have known that Mr. Farley needed to be prescribed Coumadin because he was at high risk of a subsequent cardioembolic stroke.

Had Dr. Lamphere adequately provided for continuity of care, he would have promptly involved a cardiologist and a neurologist, and he would have informed Dr. Del Rio, Mr. Farley's PCP, of the situation. This team approach would have ensured that Mr. Farley's TTE results did not slide under the radar until it was too late, and would have ensured that Mr. Farley's doctors revisited his Aspirin prescription and prescribed him Coumadin.

Had Dr. Lombardi adequately provided for continuity of care, he would have made sure that Drs. Lamphere and Del Rio were made aware of the highly troubling TTE results, and he would have intervened in Mr. Farley's care by consulting a neurologist and by admitting Mr. Farley to the hospital, rather than merely disclaiming responsibility on the grounds that he "really wasn't in the capacity of treating Mr. Farley."

In sum, the standard of care plainly calls on doctors treating patients like Mr. Farley to prescribe Coumadin in order to prevent a subsequent stroke. By failing to prescribe Coumadin, Mr. Farley's doctors violated the standard of care.

The court finds that the failure to prescribe Coumadin is attributable to both Drs. Lamphere and Lombardi.

V. Causation: The Failure to Prescribe Coumadin Led Directly to Mr. Farley's Second Stroke

A breach of the standard of care is not legally relevant unless it causes the plaintiff's harm. Here, the court finds that the Farleys have carried their burden to prove causation, because there was overwhelming evidence suggesting that Coumadin would have prevented Mr. Farley's second stroke from occurring. The failure of Mr. Farley's doctors to prescribe Coumadin was both the cause-in-fact and the legal cause of his injury.

Mr. Farley's TTE revealed that he was at high risk of forming a cardioembolic blood clot because he was suffering from asymmetrical weakening of the heart and a decreased ejection fraction. As a result, blood was likely pooling in his heart, putting him at risk of forming a blood clot. In other words, he was precisely the type of patient who would benefit from Coumadin, because Coumadin acts to dissolve existing cardioembolic blood clots and to prevent new ones from forming.

Indeed, for this very reason, the Guidelines state at the outset that patients "who have a high-risk source of cardiogenic embolism should generally be treated with [Coumadin] to prevent recurrence." The Guidelines reach this recommendation by

distilling a series of studies that assessed the relative effectiveness of Coumadin and Aspirin, each one of which concluded that Coumadin is more effective at preventing recurrent stroke in patients like Mr. Farley.

The overwhelming weight of the expert testimony coupled with the scientific studies established that Coumadin more likely than not would have prevented Mr. Farley's second stroke from occurring. The four expert witnesses testifying for the Farleys were unanimous in their contention that Coumadin would have prevented Mr. Farley's second stroke. Dr. Charash testified that when patients are placed on Coumadin, the risk of stroke drops by approximately 50% in 48 hours, and by about 95% within four days. This testimony was wholly undisputed by the government. Drs. Stein, Rutledge, and Frey all concurred, opining that to a reasonable degree of medical certainty, placing Mr. Farley on Coumadin would have prevented the second stroke from occurring.

The four expert witnesses testifying for the government took diverging positions on whether Coumadin likely would have prevented Mr. Farley's second stroke. Dr. Caplan conceded that Coumadin "more likely than not" would have prevented the second stroke. Dr. Manning stated that he "disagree[d]" that Coumadin would have prevented the second stroke, because he believed that

the first stroke resulted from atherosclerotic plaque in Mr. Farley's aorta, which would have called for Aspirin therapy. Dr. Greer took the middle road, and stated that he believed that the answer was unclear. Finally, Dr. Kim did not explicitly stake a position on whether Coumadin would have likely prevented Mr. Farley's second stroke.

In short, the clear weight of the evidence established that Coumadin would have almost certainly prevented Mr. Farley's second stroke from occurring. This finding was supported not only by the expert testimony, but by the Guidelines and their supporting scientific data and research.

VI. The Farleys are Entitled to Judgment

The Farleys have met their burden to prove the applicable standard of care, a failure to act in accordance with such standard, and that as a proximate result thereof, Mr. Farley suffered an injury that otherwise would not have occurred. See N.H. Rev. Stat. Ann. § 507-E:2(I); see also Bronson, 140 N.H. at 801. Thus, the Farleys are entitled to judgment.

Further Findings

I. Mr. Farley's Substance Abuse Did Not Preclude Coumadin Therapy

Throughout the course of the trial, the government repeatedly directed the court's attention to evidence suggesting that Mr. Farley was a chronic drug abuser. The government argued that, as a result of his drug use, Mr. Farley was not an appropriate candidate to be treated with Coumadin, and thus it was not a violation of the standard of care to prescribe him Aspirin. The court has considered this argument, but ultimately rejects it.

There was widespread agreement among the expert witnesses testifying for both parties that Coumadin can be a highly dangerous drug if administered improperly. Because Coumadin has powerful anticoagulative effects, a failure to properly follow the prescribed dosing regimen can result in catastrophic and uncontrolled bleeding.

Mr. Farley had long taken prescribed medication to treat pain related to his left arm service injuries. However, the evidence established that, during the fall of 2010, just prior to Mr. Farley's two strokes, the Manchester VA was tapering him off of a morphine prescription because Mr. Farley had tested positive for marijuana and Benzodiazepine, an anti-anxiety drug.

It was Dr. Caplan who contended that Mr. Farley's drug use made him unsuitable for Coumadin therapy. Dr. Caplan testified that patients who use illegal drugs often do not have good judgment, and he implied that in some circumstances these patients should not be trusted to self-administer Coumadin.

For several reasons, the court declines to credit this testimony. As an initial matter, there is no evidence in the record to suggest that any of Mr. Farley's doctors ever had a conversation with him about the possibility of prescribing Coumadin. Had this issue been raised with Mr. Farley, his doctors could have inquired about Mr. Farley's drug use, advised Mr. Farley of the risks associated with Coumadin, and then made an informed decision about whether Mr. Farley was a suitable candidate. Dr. Caplan himself acknowledged the importance of involving the patient in treatment decisions. Dr. Caplan testified that a doctor should "discuss with a patient the issues involved [in taking Aspirin versus Coumadin]. . . . I think [the patient's] input would be important . . . ."

What is more, Dr. Charash convincingly refuted Dr. Caplan's contention that the use of narcotics can adversely affect Coumadin patients. Dr. Charash testified that "[n]arcotics don't have a big impact on Coumadin therapy," but that doctors

are generally more concerned about potential interactions between Coumadin and certain antibiotics.

For these reasons, the court finds that the evidence was insufficient to conclude that Mr. Farley's drug use made him an unsuitable candidate for Coumadin therapy. This is true irrespective of evidence establishing that Mr. Farley had abused narcotics in the past.

II. Mr. Farley's Past Noncompliance Did Not Preclude Coumadin Therapy

Separately, the government offered evidence that Mr. Farley was a stubborn and uncooperative patient. As with Mr. Farley's drug use, the government argued that Mr. Farley's history of noncompliance rendered him unsuitable for Coumadin therapy. Therefore, the government contended, prescribing Mr. Farley Aspirin did not violate the standard of care. The court has considered this argument, but likewise rejects it.

There was substantial evidence to suggest that Mr. Farley had a history of ignoring his doctors' advice. To illustrate the point, the government's post-trial proposed findings of fact contain well over a dozen requested findings regarding Mr. Farley's past failures to take various cholesterol and blood pressure medications. See United States' Post-Trial Proposed Findings of Fact and Conclusions of Law, doc. no. 52 ¶¶ 94-109.

Similarly, as described above, the notes from Mr. Farley's visit with Dr. Del Rio on December 1, 2010, indicate that Mr. Farley told Dr. Del Rio that he was not taking blood pressure and cholesterol medications because Mr. Farley did not believe that he needed them. Mr. Farley had also repeatedly ignored warnings from multiple doctors to stop smoking.[16]

As noted previously, Coumadin can be a dangerous drug if it is administered improperly. For this reason, it is important for patients who have been prescribed Coumadin to carefully follow instructions regarding proper dosing. However, for two reasons, the court rejects the government's argument that Mr. Farley's history of noncompliance made him an unsuitable candidate for Coumadin therapy.

First, the evidence established that Mr. Farley was very likely taking Aspirin as prescribed by Dr. Lamphere between his October 21, 2010 visit, and his appointment with Dr. Del Rio on December 1, 2010. Dr. Del Rio's notes from the December 1, 2010 visit specifically indicate that Mr. Farley was not taking his prescribed Atenolol or Crestor. The notes are silent, however, regarding whether Mr. Farley was taking his prescribed Aspirin. Presumably, had Mr. Farley stated that he was not taking his

[16] Nevertheless, the medical records demonstrate that Mr. Farley lost some 50 pounds between 2006 and 2010, suggesting that he followed his doctors' instructions to lose weight.

Aspirin, Dr. Del Rio would have made a note to that effect in the record, as he did with the other two drugs. Additionally, the pharmacy records suggest that Mr. Farley had been taking Aspirin as prescribed during this time. These records indicate that on October 21, 2010, Mr. Farley was given a 60-day supply of Aspirin, which he refilled on December 1, 2010, roughly 40 days later. The refilling of the prescription is evidence that Mr. Farley's Aspirin supply was beginning to dwindle.

Second, Mr. Farley's son, James, testified that his father told him shortly after the first stroke occurred that the stroke had been a "real kick in the pants," and that Mr. Farley had stopped smoking and was taking medication that had been prescribed to him. The court found James Farley to be a credible witness, and has no reason to doubt that this conversation took place as described.

In sum, the court finds it more likely than not that Mr. Farley was taking his prescribed Aspirin, that he was compliant following his first stroke, and that he would have taken Coumadin had it been prescribed to him. The court declines to find that Mr. Farley's past noncompliance excuses the Manchester VA's failure to prescribe him Coumadin.

III. The Government Cannot Prevail on a Comparative Negligence Theory

The court finds that the government cannot prevail on a theory of comparative negligence. Parsing this issue requires a bit of background information, in terms of both the record and New Hampshire law.

In New Hampshire, claims of comparative negligence are subject to N.H. Rev. Stat. Ann. § 507:7-d, which provides that "[c]ontributory fault shall not bar recovery in an action by any plaintiff . . . to recover damages in tort . . . if such fault was not greater than the fault of the defendant . . . but the damages awarded shall be diminished in proportion to the amount of fault attributed to the plaintiff by general verdict." In assessing claims of comparative negligence, "[t]he burden of proof as to the existence or amount of fault attributable to a party shall rest upon the party making such allegation." Id.

In the government's answer to the Farleys' complaint, the government asserted a defense of comparative negligence. Generally, claims of comparative negligence seek to mitigate or eliminate damages awards on the theory that the plaintiff's own negligence contributed to his injury. See Hurley v. Public Serv. Co., 123 N.H. 750, 756 (1983) (explaining that the New Hampshire Legislature enacted the comparative negligence statute

to "allocate more equitably the responsibility for injuries due to negligent conduct on the part of parties on both sides of a lawsuit"); see also Jenks v. New Hampshire Motor Speedway, Civil No. 09-cv-205-JD, 2012 U.S. Dist. LEXIS 2827, at *7 (D.N.H. Jan. 10, 2012) (quoting Broughton v. Proulx, 152 N.H. 549, 558 (2005) ("'A plaintiff's negligence involves a breach of the duty to care for oneself' that is not obviated by others' obligation to use due care.")).

As detailed above, the government offered extensive evidence regarding Mr. Farley's use of narcotics and his history of noncompliance. However, the government's sole argument regarding these issues was that Mr. Farley was not an ideal candidate for Coumadin therapy, and that therefore prescribing him Aspirin did not violate the standard of care.

The government's contention can be summarized by the following excerpt from its closing argument:

> With respect to Mr. Farley's noncompliance . . . there are at least three or four separate medical records from Dr. Del Rio in which he speaks with the patient, asks the patient if he's taking his medication, and repeatedly the patient says, no, I'm not . . . .
>
> [S]everal times in October and November [of 2010] . . . . He tested positive . . . for marijuana [].
>
> These are not matters that would be ignored by a doctor who is trying to make a decision about

> whether or not to start a patient on a very, very difficult and very dangerous course of medication.

To be clear, although the government pled comparative negligence as a defense in its answer to the complaint, the government did not in any way develop the argument that Mr. Farley's use of narcotics and his history of noncompliance made him legally culpable for either or both of his strokes. The government focused on these issues for the sole purpose of showing that the Manchester VA's failure to prescribe Mr. Farley Coumadin did not violate the standard of care.

The evidence conclusively established that smoking, high blood pressure, and high cholesterol are prominent risk factors for stroke. Thus, given the evidence of Mr. Farley's repeated refusals to stop smoking and to take prescribed medication to address these problems, the government could have taken the position that Mr. Farley was at least partially responsible for putting himself at risk of suffering a stroke.

Ultimately, however, the government did not make this argument, and the court declines to read further into the government's case than is merited by the trial record. This is particularly true given the plain requirement under New Hampshire law that the party asserting a contributory fault defense bear the burden of proof as to the existence or amount

of fault attributable to the opposing party. See N.H. Rev. Stat. Ann. § 507:7-d. For these reasons, the court finds that the government may not benefit from a comparative negligence defense.

IV. Observations Regarding the Presentation of Evidence

The government presented what can only be described as an internally inconsistent case. On the issue of the likely cause of Mr. Farley's strokes, the government's expert witnesses disagreed with one another on the stand, and several of them openly disagreed with the government's own pre-trial stipulations regarding cardioembolic blood clots and the recent timing of Mr. Farley's heart attack.

To illustrate the point, whereas the government's pre-trial proposed findings of fact sought a finding that Mr. Farley's strokes were cardioembolic in nature, the post-trial proposed findings of fact ask the court to find that Mr. Farley's strokes were caused by atherosclerotic plaque or a dissection. The inconsistency served to undermine the credibility of the government's expert witnesses, as well as the credibility of the government's theory of the case. This is particularly true when considered in light of the Farleys' case, which was clearly presented and remarkably consistent.

What is more, as will be discussed below, the government made the decision not to meaningfully contest the damages award. Thus, once the court reached a finding in Mr. Farley's favor on liability, the court had little choice but to arrive at the significant damages figures that follow.

Damages

"At trial, the plaintiff bears the burden of proving 'the extent and the amount' of her damages." Hutton v. Essex Grp., Inc., 885 F. Supp. 331, 334 (D.N.H. 1994) (quoting Kassel v. Gannett Co., 875 F.2d 935, 950 (1st Cir. 1989); citing Whitehouse v. Rytman, 122 N.H. 777, 780 (1982)) (additional citation omitted). Though damages need not be proven with "'mathematical certainty or sliderule precision,' . . . [i]t is axiomatic that the plaintiff must prove her damages to a degree of reasonable certainty." Hutton, 885 F. Supp. at 334 (quoting Kassel, 875 F.2d at 950 (applying New Hampshire law)). Alleged "future damages must be reduced to present value." Reed v. Nat'l Council of Boy Scouts of Am., Inc., 706 F. Supp. 2d 180, 194 (D.N.H. 2010) (quoting Hutton, 885 F. Supp. at 334).

The Farleys seek damages in the following amounts, and for the following purposes:

- $1,368,710.62 in upfront, one-time costs, consisting of $666,270.62 in medical costs billed to Mr. Farley personally since his second stroke, $577,440.00 for the purchase of a modified, handicap-accessible home, and $125,000.00 for surgery to fix contractures (a painful condition caused by the shortening and constricting of the muscles) that have resulted from Mr. Farley's paralysis.

- $16,580,898.00 in future medical care costs, consisting of $15,575,666.00 in future medical care and attendant costs, and $1,005,232.00 in costs related to the purchase and maintenance of a Baclofen pump.[17] These future medical care costs assume a life expectancy for Mr. Farley of 22.2 years.[18]

- $17,000,000.00 in non-economic compensation, consisting of $2,600,000.00 for disfigurement, $4,500,000.00 for loss of enjoyment of life, $8,600,000.00 for pain, suffering, and mental anguish, and $1,300,000.00 for loss of consortium.

- $1,300,000.00 in loss of consortium damages for Mrs. Farley.

- Total damages sought: $36,249,608.62.

In support of the proposed damages, the Farleys offered the testimony of two expert witnesses. The first was Dr. Robert Eilers, a board-certified physical medicine and rehabilitation doctor. The second was Catherine Newick, an economist.

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[17] A Baclofen pump is a device that pumps medication directly into a patient's spinal column.

[18] The Farleys' Amended Proposed Findings of Fact and Conclusions of Law seems to erroneously total the future medical care and Baclofen pump costs. See doc. no. 51 ¶ 9.19. To the extent that the court has misconstrued this figure, the Farleys may bring the matter to the court's attention. See Fed. R. Civ. P. 52(b).

Dr. Eilers opined on two distinct issues. First, he testified regarding the methodology that he used to arrive at his estimate that Mr. Farley's life expectancy is 22.2 years. On this issue, Dr. Eilers testified regarding his use of life-expectancy tables from the Centers for Disease Control and Prevention, as modified to account for Mr. Farley's present condition.

Second, Dr. Eilers testified regarding his completion of a Rehabilitation, Life Assistance and Medical Management Plan for Mr. Farley ("care plan"). This care plan estimates the present and future costs of a litany of medical expenses that Mr. Farley is likely to encounter. Examples include a handicap-modified vehicle for transportation, skilled nursing care, and orthotic equipment. Central to Dr. Eilers's care plan was his suggestion that Mr. Farley be relocated from a treatment facility to his home so that he can be closer to his family.

Ms. Newick offered testimony regarding her completion of a report detailing the financial considerations inherent in projecting Mr. Farley's care costs over the next 22.2 years, taking into account factors such as inflation.

I. Damages for Medical Care

Dr. Eilers and Ms. Newick were both highly credible witnesses. Dr. Eilers offered practical insight regarding Mr. Farley's likely future medical needs based on several decades of relevant experience. His testimony was clear and succinct, and his testimony regarding the mental and physical health benefits associated with allowing Mr. Farley to move home with his family was compelling. Likewise, Ms. Newick's testimony was highly credible, and assisted the court in understanding the issues involved in complex cost projection.

Curiously, the government effectively conceded the issue of damages and did not offer expert testimony on Mr. Farley's future medical care. Nor did the government spend much time at trial challenging Dr. Eilers's testimony on cross examination. Rather, at points during the trial, the government invited the court to conduct a line-by-line analysis of Dr. Eilers's care plan, and to eliminate unnecessary expenses. For example, during closing arguments, counsel for the government stated that "[t]here are a number of things in the [care plan] that this court may well find to be more than reasonably necessary."

The court declines to second guess Dr. Eilers's care plan. The government offered no evidence whatsoever that Dr. Eilers was unqualified to prepare the care plan, or that a single one

of the projected expenses that his care plan contains is unnecessary. In the absence of any evidentiary guidance, it is far beyond this court's purview to undertake a line-item vetoing exercise where the subject matter involves the necessarily sophisticated care that must be provided for a patient with complex medical needs such as Mr. Farley.

To challenge Dr. Eilers's life expectancy projections, the government offered the deposition testimony of Dr. Kim. During his deposition, Dr. Kim discussed a report that he had authored regarding decreases in life expectancy that result from catastrophic strokes. Based on that study, Dr. Kim concluded that Mr. Farley is likely to live 3.32 years for every five years that a white male who had not suffered a catastrophic stroke would be likely to live. Although Dr. Kim's testimony on this issue was brief, the court found Dr. Kim's theory regarding decreases in average life expectancy for catastrophic stroke victims credible and persuasive. After consideration of the life expectancy projections offered by both Drs. Eilers and Kim, the court finds that Mr. Farley's life expectancy is 15 years.

The sum of **$1,368,710.62** is reasonable and medically necessary to cover the upfront, one-time costs of Mr. Farley's

past medical expenses, his contracture surgery, and the purchase or conversion of a home to accommodate his needs.[19]

The sum of **$12,000,000.00** in future medical care costs is reasonable and medically necessary. The court arrived at this figure by reducing the Farleys' proposed future medical costs award of $16,580,898.00 (which was premised on a 22.2-year life expectancy) to account for a 15-year life expectancy. In arriving at this figure, the court carefully considered the individual expenses forecasted in Dr. Eilers's care plan, as well as the annualized costs and present value figures set forth in Ms. Newick's report.[20]

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[19] The government asserts that the court must deduct the amount of medical benefits paid in the past from any award made under the FTCA. Indeed, "where the Veterans Administration has paid the hospital expenses incurred in connection with the injury no award is to be made therefor in a federal tort claims action." United States v. Hayashi, 282 F.2d 599, 603 (9th Cir. 1960). The rule from Hayashi is inapposite, as the Farleys do not seek compensation for amounts previously paid by the Veterans Administration for Mr. Farley's care. Rather, they seek compensation for amounts previously billed to Mr. Farley personally, as well as for future medical expenses.

[20] The court has corrected for two errors that the government identified in Ms. Newick's report. First, Ms. Newick failed to calculate the present value of a rehabilitation case manager. The court has made that calculation in accordance with Ms. Newick's testimony at trial acknowledging the error and explaining the fix. The second error concerned the Baclofen pump, which Mr. Farley does not presently need, but will likely need at some point in the future. With regard to this expense, Ms. Newick used the life expectancy of the pump (seven years) to calculate the age at which Mr. Farley would need to begin using

II. Non-Economic Damages

The court turns to the question of non-economic damages. As stated by the New Hampshire Supreme Court:

> No one to our knowledge has been able to devise a formula by which compensation for pain and suffering can be determined with precision. Pain and suffering are too subjective to lend themselves to such exactness. Consequently, we do not permit any formula or mathematical tool to be used in computing such damages.

Steel v. Bemis, 121 N.H. 425, 428 (1981). The question is left to the factfinder, who hears the testimony and weighs the facts. Id. The goal is "to reach a just result" with such an award. Id.

The evidence of Mr. Farley's pain and suffering from locked-in syndrome was undisputed.[21] The harrowing psychological trauma of locked-in syndrome was brought home to Mr. Farley in the earliest moments after his second stroke. At the hospital, the doctors originally believed Mr. Farley was in a coma and

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it. Ms. Newick's use of that number was unsupported by the medical evidence. Although Dr. Eilers testified that he did not know exactly when Mr. Farley would need to begin treatment with a Baclofen pump, he included the cost of that treatment in his report as one that Mr. Farley would incur in the near future. Absent evidence to the contrary, the court credits Dr. Eilers's report and includes the cost of the Baclofen pump as detailed by Dr. Eilers.

[21] The court uses the term "pain and suffering" as inclusive of pain, suffering, mental anguish, disfigurement, and loss of enjoyment of life.

would not recover. The truth was otherwise. Mr. Farley lay trapped inside his paralyzed body, lucid and mentally alive, but he could not communicate that to his caregivers and family -- who were in his hospital room discussing end-of-life scenarios. Mr. Farley's adult children did not believe he was in a coma; they thought that he was moving his eyes in an effort to communicate with them. The caregivers assured them that they were wrong and that his eye movement was merely a symptom of his comatose state. At some point, a nurse noticed that Mr. Farley's eyes were tracking her as she walked in and out of his hospital room. The diagnosis of locked-in syndrome followed. While Mr. Farley has learned to communicate using eye movements, he remains unable to speak.

The testimony included that of his wife, his adult children, Kimberly-Rae and James, and Dr. Eilers. During Dr. Eilers's testimony, a "day-in-the-life" video of Mr. Farley was shown, and Dr. Eilers narrated and explained to the court the various physical and emotional challenges Mr. Farley faces on a daily basis.

What follows is a brief, bulleted summary of some of the evidence that Mr. Farley presented concerning his pain and suffering:

- Mr. Farley's locked-in syndrome is permanent. Although the stroke left Mr. Farley all but completely paralyzed, the evidence established that he can still feel pain, pressure, numbness, and other sensations. By way of example, Mr. Farley knows when he is going to defecate and urinate, but he can do nothing about it.

- Mr. Farley has painful contractures of his upper and lower extremities. His elbow, for example, is contracted 90 degrees. His hands are fisted in a position that cause his fingernails to dig into his palms, causing him pain. His legs are also criss-crossed as a result of these contractures, which prevents him from sitting without pain, and renders him unable to sit in a wheelchair for any more than a short period of time.[22]

- Mr. Farley has two feeding tubes and a tracheotomy. The tracheotomy is a tube in Mr. Farley's throat through which he breathes. When there is build-up in his tracheotomy, he regurgitates sputum. He must always wear a bib or towel around his neck to catch the discharge. As described by Dr. Eilers: "If he's choking, he has to hope that they come quickly because he can't yell, 'I'm choking.' He's basically unable to control his world environment at all."

- For the four years preceding trial, due to the challenges his current caregivers face in transporting him, Mr. Farley has not been taken outside except for transportation related to medical visits. Due to the distance between his current placement in Pittsfield, Massachusetts and Keene, New Hampshire, where his family lives (up to a six-hour, round-trip drive), Mr. Farley does not see his family very often.

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[22] The damages award for Mr. Farley's future medical care includes the cost of certain surgeries and home care that will reduce his pain and suffering. For example, the award includes the cost of surgeries to correct his joint contractures. The court's award for pain and suffering thus takes into account differences between his past pain and suffering and the anticipated relief to him in the future due to the medical care he will receive pursuant to the medical care award.

- Mr. Farley's family testified about Mr. Farley's life before the second stroke. Mr. Farley loved the outdoors. He hiked with his dogs almost daily; he loved to fish; he camped regularly; and more than anything he enjoyed spending time with his family and especially his children. Mr. Farley's children, Kimberly-Rae and James, testified about how active and present Mr. Farley was as a father.

- The testimony of Kimberly-Rae, about how her relationship with her father and the way in which he encouraged her to accomplish whatever she set her mind to, was particularly compelling. Mr. Farley's loss of enjoyment of life has been, and will continue to be, profound.

In deciding on the appropriate figure for non-economic damages, the court has carefully considered the entire record, including the comparison verdicts provided by the government and Mr. Farley. See doc. nos. 43 and 53. Mr. Farley provided published verdicts from six jurisdictions across the country in cases involving plaintiffs who had locked-in syndrome. It is not clear in each case what portion was allocated for pain and suffering. However, in those cases where pain and suffering was clearly allocated, the awards range from $15,000,000.00 to $65,000,000.00. Mr. Farley also provided a lengthy list of exemplar verdicts in FTCA cases involving catastrophic injuries. The pain and suffering awards in those cases range from $4,500,000.00 to $31,000,000.00. Finally, Mr. Farley provided a list of exemplar verdicts from various jurisdictions, including several in the First Circuit and in New England, in cases

involving non-economic damages for injuries similar to locked-in syndrome. Those awards range from $5,000,000.00 to $58,000,000.00.[23] The government provided two pain and suffering verdicts: one from Pennsylvania involving a plaintiff with locked-in syndrome ($100,000.00) and one from New Hampshire involving a 78-year-old plaintiff with left-side paralysis ($1,400,000.00).

The court has evaluated the government's objection to the Farleys' request for a total of $17,000,000.00 in non-economic damages. In the court's view, the non-economic damages award the Farleys seek is unreasonably high. After careful consideration, the court finds that Mrs. Farley, on behalf of Mr. Farley, is entitled to non-economic damages in the amount of **$8,100,000.00**. The court finds that this sum is reasonable in light of the evidence offered at trial and the complete record in this case.

[23] This list of comparator awards for injuries similar to locked-in syndrome contained total verdicts as high as $121,000,000.00, however, it was impossible for the court to discern what portion was allocated for pain and suffering for many of those awards. Thus, the court disregarded any ambiguous figures for comparison purposes.

Included in the $8,100,000.00 figure is $100,000.00 in loss of consortium damages for Mr. Farley. The court declines to award the full $1,300,000.00 for loss of consortium that Mr. Farley seeks. The uncontroverted evidence established that Mr. and Mrs. Farley had separated several years prior to the events in this case, and that Mr. Farley was living apart from his family at the time of his strokes. Nevertheless, the evidence also established that Mr. Farley maintained an amicable relationship with Mrs. Farley during this time, as demonstrated by the compelling testimony of Mrs. Farley, as well as Mr. Farley's son, James, and his daughter, Kimberly-Rae. Finally, the evidence established that Mrs. Farley has now become one of Mr. Farley's primary caregivers.

Finally, the court finds that Mrs. Farley, individually, is entitled to **$100,000.00** for loss of consortium. For the same reasons as those described above, the court declines to award Mrs. Farley the full $1,300,000.00 that she seeks.

III. Form of Award

The government has filed a motion seeking an order requiring that the future medical care award be placed in a reversionary trust, funded by the government where the remainder of the trust would revert to the government in the event that

Mr. Farley dies before he has spent the full amount of his award for medical care. Mr. Farley objects, arguing that a First Circuit case, Reilly v. United States, 863 F.2d 149 (1st Cir. 1988), prohibits such reversionary trusts. The court disagrees with Mr. Farley.

In Reilly, the First Circuit held that a court did not have the power to order the government to pay an FTCA damages award in anything other than a lump-sum payment. 863 F.2d at 170. The government argued that the district court erred in not requiring the future medical damages to be awarded via a structured, periodic payment (such as an annuity). The First Circuit held that payment of damages in installments was not permitted under the FTCA. Once the government makes a lump-sum payment, however, the First Circuit made clear that a district court has an obligation to protect the intended beneficiary of that award, particularly where, as here, it goes to a third party on behalf of the injured plaintiff. The First Circuit explained:

> When a tortfeasor loses at trial . . . it must pay the judgment in one fell swoop. After the wrongdoer and its funds have been parted, the focus shifts: it cannot be doubted that the court has power (1) to ensure that the recovery benefits the victim, and (2) to exercise strict supervision over investment and use of the funds if the victim is a legal incompetent or otherwise in need of protection. But these verities in no manner support the proposition that the

> wrongdoer has a right to pay in installments where the plaintiffs are unwilling. Nor does the court have a right to impose a periodic payment paradigm on the parties, over protest, solely to ease the tortfeasor's burden or to suit some fancied notion of equity.

Reilly, 863 F.2d at 170.

The court intends to order the government to place Mr. Farley's entire medical care award into a trust administered by a person completely independent of both the government and Mr. Farley's relatives. A trust where the government has no control over the administration, but retains only a reversionary interest as the remainder beneficiary (in the event of Mr. Farley's premature death) may well serve the best interests of Mr. Farley. Such an arrangement would maximize the possibility that the corpus of the trust would be used to provide Mr. Farley with the best care as soon as possible. This is especially important in Mr. Farley's case because his need for home health care is urgent, and the early, upfront costs of his care plan (as drafted by Dr. Eilers), which are largely directed to the goal of bringing Mr. Farley home, are substantial, amounting to well over $1,000,000.00. A trust from which the corpus reverts to the government minimizes any incentive his caregivers might

have to drag their feet with regard to incurring those expenses.[24]

Conclusion

The clerk of the court is instructed to enter judgment against the United States in favor of Mrs. Farley, on behalf of Mr. Farley, in the amount of **$21,468,710.62**, and in favor of Mrs. Farley, individually, in the amount of **$100,000.00**. The judgment shall be paid in a lump sum. The portion of the lump-sum payment to Mr. Farley that is devoted to Mr. Farley's medical care ($13,368,710.62) shall be placed into a trust for the benefit of Mr. Farley. The parties are ordered to meet and confer, and to file, on or before April 22, 2015, a proposed order setting up the terms of such a trust. The goal of such trust shall be to maximize the likelihood that the medical care award will be spent solely on Mr. Farley's medical care during

[24] Attached to the government's motion for a reversionary trust is a proposed order establishing such a trust (doc. no. 54-2). That document reads as though it were a document the government had negotiated with Mr. Farley to settle the case. It reads that way because it gives the government control over decisions related to the expenditure of Mr. Farley's medical care award. But, of course, the government would have a clear interest in minimizing the amount spent on Mr. Farley's medical care by virtue of its reversionary interest. While the court is inclined to approve a reversionary trust, any such trust should not give the government power to control the disposition of trust funds. The sole role for the government should be that of remainder beneficiary.

the remainder of his life and in a manner that maximizes his physical and mental wellbeing. Should the parties fail to file a proposed order that meets this goal, the court will appoint, on an expedited basis, an expert to advise the court on trust law so that the court can design a trust instrument that best protects Mr. Farley's interests.

Pursuant to 28 U.S.C. § 2678, attorneys' fees are limited to 25% of the judgment, which the court finds to be a reasonable fee in this case. Post-judgment interest shall be awarded in accordance with 31 U.S.C. § 1304(b)(1).[25]

SO ORDERED.

Landya McCafferty
United States District Judge

April 3, 2015

cc: Jamal K. Alsaffar, Esq.
Tom Jacob, Esq.
T. David Plourde, Esq.
Lawrence A. Vogelman, Esq.

[25] The Plaintiff's Amended Proposed Findings of Fact and Conclusions of Law (doc. no. 51), and the United States' Post-Trial Proposed Findings of Fact and Conclusions of Law (doc. no. 52) are adopted to the extent not inconsistent with this Order.