

## Acting Before You Forget

Have you ever had trouble remembering a specific word or phrase? While some might attribute forgetting things to stress or lack of sleep, the reality is that the older you become the more dangerous that forgotten word is. Too often people brush aside the thought of Alzheimer's Disease until it is too late to stop.

According to the Alzheimer's Disease Education and Referral Center, 5.1 million Americans suffer from Alzheimer's Disease. Symptoms may first appear after the age of 60, but have been known to appear even earlier. Memory loss begins to worsen and changes in other cognitive abilities become evident. People often are diagnosed in this stage.

As Alzheimer's Disease progresses to the moderate stage, memory loss grows as people start to have trouble recognizing family and friends. By the final stage, brain tissue has shrunk significantly and plaques have spread throughout the person's brain. The patient will often become completely dependent on caretakers as they lay in bed most or all of the time. Slowly the body begins to shut down as the disease takes over.

According to Janet Rowley, Research Program Manager for the Wisconsin Registry for Alzheimer's Prevention, "Alzheimer's Disease is just such a difficult thing to deal with. It has the power to destroy a loved one while also wearing down the patient's family." Since her mother had Alzheimer's Disease for ten years, Rowley has first hand experience with the disease and knows all too well the toll which it can have on a family. Not only does it take away a family member, but it also destroys the relationships that have been forged over years of spending time with one another.

The cruel nature of the disease places great emphasis on the need to take early action. Since moderate Alzheimer's Disease already has such a significant impact upon a person's life,

doctors and researchers are working hard to find ways to detect the disease early on or prevent it all together. Asenath LaRue, a neuropsychologist, described the importance of the efforts being made to stop Alzheimer's Disease in its earliest form saying, "For many diseases, early detection is the key to slowing down progression. Early detection is important because existing treatments and lifestyle interventions are more effective at milder disease stages than at more severe illness stages."

The slow and painful death caused by Alzheimer's Disease is something no one should have to experience. By focusing on things that can be done to combat the disease before it arrives, patients and doctors can work together in order to ensure that those with Alzheimer's Disease are the given the best chance at living a normal life, free from the devastation associated with it. Before that happens, however, it will be up to researchers to develop new ways to detect and treat the disease before its onset.

### **What has been Done?**

While hope for discovering a cure for Alzheimer's Disease has been high in the past, a cure has still yet to be developed. According to the American Health Assistance Foundation's program, Alzheimer's Disease Research, in the 1970s scientists gained a much greater understanding of complex nerve cells in the brains of Alzheimer's Disease patients. Several drugs were approved to treat cognitive symptoms of the disease as more research was done on Alzheimer's Disease susceptibility cells. While the progress made was notable, scientists had only successfully created treatments and drugs that could slow the progress of cognitive decline.

"In the 1970s people expected to have a cure for Alzheimer's Disease in a few years with five years being the maximum deadline for a cure. Everyone thought it was something that

would go away rather quickly. What many people failed to recognize was how complex and unpredictable the disease is,” said Rowley.

One of the things that makes Alzheimer’s Disease so difficult to cure is that the symptoms take so long to appear. In a 2012 interview with *MIT Technology Review*, Kun Ping Lu, a physician scientist at Harvard Medical School, described the difficulty associated with Alzheimer’s Disease saying, “Alzheimer’s takes more than a decade to develop, and by the time your brain has damage, it’s very hard to reverse. We have to find out as early as possible which patients are going to get it.”

The intense difficulty of treating Alzheimer’s Disease after it begins to harm a patient’s brain is perhaps the biggest reason why doctors and researchers have had such trouble with the disease. Previous medications have only been able to temporarily treat the symptoms instead of actually preventing or stopping the disease. After years of failing to defeat the disease, researchers are going back to the drawing board. They are attempting to discover new ways to detect the disease before it starts, therefore giving patients the best chance possible of treating the disease before it does too much damage to the brain.

### **The Here and Now**

Today, thousands of studies across the globe are working on finally conquering Alzheimer’s Disease. Unlike researchers from the past 40 years, though, current studies are working towards detecting the disease earlier and finding new ways to possibly prevent it. One such study took place right here in Madison, at the Alzheimer’s Disease Research Center. The goal of the study was to determine the influence of Alzheimer’s Disease on brain function during self-appraisal in healthy middle-aged adults. Self-appraisal is often described as a self evaluation that forces a person to identify his or her own strengths and weaknesses. After analyzing the

results of the study, researchers concluded that subtle changes in brain function were attributable to Alzheimer's Disease risk factors.

What was most startling about this study was that many of the participants were around 50 years old. While Alzheimer's Disease usually starts to show symptoms at the age of 60 or later, this study detected some possible signs of Alzheimer's Disease much earlier. Since it is obvious how difficult Alzheimer's Disease can be to treat when it begins to progress, this type of discovery offers researchers and doctors the chance to begin treatment of the disease in its earliest stages. Through early treatment, Alzheimer's Disease can be significantly weakened and the patient can avoid substantial brain damage. Detecting any type of early warning sign marks a key change in the way researchers try to combat the disease. Instead of attempting to reverse the damage caused by the disease, researchers and doctors are intent on suppressing the disease before it ever has a chance to make a significant impact.

Another example of the revolutionary shift towards concentrating on preventative measures and early detection of Alzheimer's Disease is Gammagard therapy. This type of therapy targets amyloid plaques, or clumps in the brain, that are often considered to be the "Achilles' heel" of Alzheimer's Disease. By doing so, amyloid plaques are neutralized and inflammation damage is minimized. All of these steps contribute towards slowing down cognitive decline and vastly reducing the damage inflicted upon the brain as a result of Alzheimer's Disease. The big catch, though, is that no aspect of the therapy is considered to be effective if the disease has progressed too far.

Laurie Ryan, Program Director for the Alzheimer’s Disease Clinical Trails at the National Institute on Aging, described the importance of the therapy saying, “Given what we know now about the early changes in the brain 25 years out, we know therapy has to be administered early.”

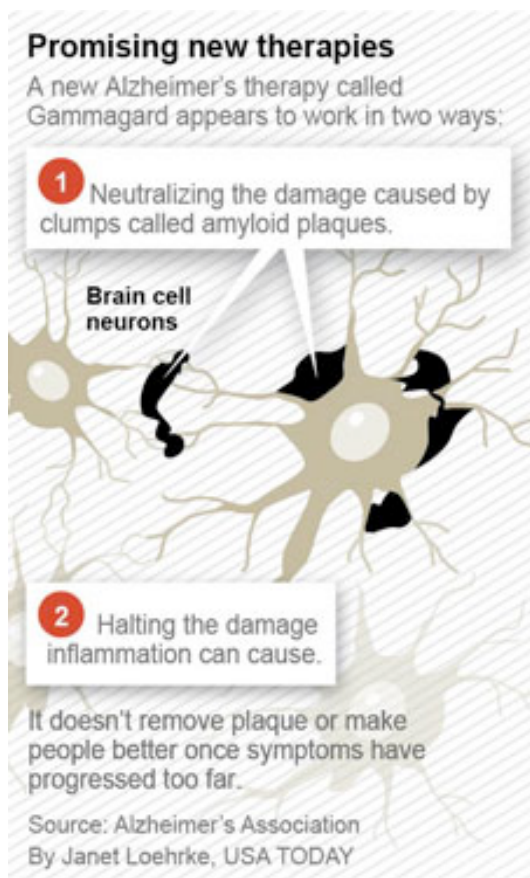


Figure 1



Figure 2- Photo Courtesy of USA Today

Overall, researchers and scientists are placing a growing amount of emphasis on the need to treat Alzheimer's Disease before it reaches its alarmingly complex and powerful final stages. Early action is the key to keeping Alzheimer's Disease under control. As a result, more studies will shift their focus to preventative measures and early treatment versus drugs that attempt to reverse the effects of the disease.

### **What Needs to be Done and Why**

The development of new therapies and treatments is encouraging, but all of these efforts will be greatly diminished until the diagnosis of Alzheimer's Disease is corrected and simplified. Early treatment is not feasible in the absence of early diagnosis. Kirk R. Daffner, Chief of Cognitive and Behavioral Neurology at Brigham and Women's Hospital, and Leonard F.M., Scinto, investigator at Brigham and Women's Hospital, use their book, *Early Diagnosis of Alzheimer's Disease*, to highlight the need for reliable diagnosis of Alzheimer's Disease saying, "The development of clinical trials and the subsequent availability of therapies aimed at slowing the disease process early in its course will depend on an improved ability to identify patients in the earliest stages of illness."

As of now, doctors are still struggling to identify Alzheimer's Disease in its earliest stages, when it is weakest and inflicts the least amount of harm upon the brain. Through continued research, numerous early risk factors attributed to Alzheimer's Disease will hopefully be discovered and, subsequently, make it easier for doctors to properly diagnose patients and catch any early warning signs. As research of the disease continues to take place, both doctors and researchers will continue to work towards unavailing early risk factors for Alzheimer's Disease, most of which, have currently not yet been identified. This type of early detection

remains crucial since the overwhelming majority of research continues to be directed towards early treatment of Alzheimer's Disease.

Rowley described the immense responsibility which doctors face in the effort to support early detection of Alzheimer's Disease saying, "Doctors really play a bigger role than most people think. They are the ones that start early treatment. By noticing certain warning signs or risk factors, they can advise the patient to begin early treatment and fight the disease while it is still weak."

Another important preventative measure that can be taken to delay the onset of Alzheimer's Disease is maintaining a healthy lifestyle. This is especially important for those with a family history of the disease. For example, Rowley described her own determination to avoid Alzheimer's Disease by losing 110 pounds. Since diabetes is often closely linked with Alzheimer's Disease, Rowley knew how important it was to change her lifestyle and give herself the best chance possible of avoiding the disease despite her family history. By educating physicians on how to properly diagnose patients and advocating people to live healthy lifestyles, Alzheimer's Disease will be suppressed more quickly than ever before.

### **The Fight Rages On**

As seen time and time again, Alzheimer's Disease is nearly impossible to stop when it begins to progress and take over someone's body. As a result, preventative measures must be taken in order to ensure that each patient is given the best chance possible to either avoid the disease all together or defeat it in its earliest stages. As researchers continue to develop new ways to identify early signs of Alzheimer's Disease, it is extremely important that those at risk for the disease take action before facing health problems.

One preventative measure against Alzheimer's Disease is to lead a healthy lifestyle. A sound mind and body will help a person bypass other diseases and health issues that are often linked closely to the development of Alzheimer's Disease such as Diabetes. It is also important that a person frequently visits his or her doctor in order to check for any signs of Alzheimer's Disease. The brief cognitive tests performed by a doctor can go a long way towards helping a person escape years of torment.

As research progresses more towards preventing Alzheimer's Disease, rather than merely slowing it down, doctors will be able to aid patients by providing an accurate diagnosis. All too often current patients remain misdiagnosed as a result of poor procedure for identifying Alzheimer's Disease. By simplifying the process, doctors across the country will begin to approach diagnosis of the disease with a single mindset instead of having every doctor look for something different.

In addition to help from doctors, research laboratories across the world are working on studies that relate specific actions or behaviors to the early onset of Alzheimer's Disease. Each discovery will make it easier to identify the disease as early as possible and treat it right away.

All of these efforts are geared towards emphasizing the intense need to adopt preventative measures that combat Alzheimer's Disease before its arrival. Since the effects of the disease remain practically irreversible, the only way to go about defeating it is by identifying and treating Alzheimer's Disease quickly. For years doctors have tried to tackle the disease after it begins to destroy a person's life. Unfortunately, they have only been able to slow down the disease. These years of failure make it more important than ever that people begin to understand the need to be aware of the disease earlier than ever before.



By highlighting the vulnerability of Alzheimer's Disease early in its development, people can keep the disease under control and avoid the same fate that millions of people with the disease have suffered. As Rowley pointed out through her experience with her mother, Alzheimer's Disease is devastating to everyone that comes in contact with the disease, including caregivers. With advances in both diagnoses and early detection of Alzheimer's Disease, future patients will be able to avoid the horrors of the disease by suppressing it early and preventing its destruction of the human brain as well as families.