



Alzheimer's Disease

CHANGING MINDS AND THE BATTLE FOR TIME

By Keely Stockett

EXPERT ADVICE

Alzheimer's Therapy

“For Alzheimer’s patients, a consistent routine is key. It’s helpful to use a lot of visual cues and notes. It’s also important to explain what is going on and remind them of what is happening next. When they do forget things, join their journey and act like it’s your first time hearing it too, always showing lots of patience and empathy.”



Dawn Dunn,
Lantern
Alzheimer's
Program Director
Morning Pointe
of Collegedale

It’s a brain disease without a heart.

Whether Alzheimer’s disease quietly creeps into its victims’ lives or makes a grand, unwelcome entrance, it inevitably becomes a runaway train that erases the past and disrupts the future. Ultimately, it impedes everything the brain controls, starting with short-term memory and ending with the basic functions required to live. There is no known way to prevent or slow it, and a cure has not been found—yet.

The disease’s reach is broad and growing. According to the Alzheimer’s Association, more than 5 million Americans are currently living with Alzheimer’s; that number could triple by 2050. Victims of the disease aren’t the only ones affected. As it progresses, patients require near-constant care and assistance. Right now, there are more than 15 million caregivers of people with Alzheimer’s and other dementia. In 2012 alone, they provided more than 17.5 billion hours of unpaid care, valued at more than \$216 billion.

As the sixth-leading cause of death in the nation, it could be considered an epidemic—and it’s an expensive one. This year, it will cost the U.S. \$203 billion, which is on track to rise to \$1.2 trillion by 2050.

Alzheimer’s doesn’t care about careers, health insurance, or plans for the future. Its toll is steep—physically, financially, and emotionally. But as the scope of the disease grows, so too does the urgency to stop it. In recent years, the medical community has gained a much clearer picture of what actually happens to an Alzheimer’s brain. As a result, our understanding of the disease’s progression has grown exponentially—and we’re getting closer to fighting back.

The Brain Under Siege

The brain has three main parts: the cerebrum, the cerebellum, and the brain stem. The cerebrum, which fills most of the skull, controls memory, thinking, feeling and movement. Located in the back of the head, the cerebellum is responsible for coordination and balance. The

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brain stem sits beneath the cerebrum and in front of the cerebellum, controlling automatic functions like breathing and digestion.

The outer layer of the cerebrum—the brain’s wrinkly surface area—is called the cortex. Different cortex regions are linked to specific functions, such as interpreting internal and external sensations, generating thoughts, forming and storing memories, and controlling voluntary movement.

How does a three-pound, jelly-like organ manage all of that? There’s a lot of action happening in there, and it’s all on the cellular level. According to the Alzheimer’s Association, the average adult brain contains about 100 billion nerve cells, or neurons, and branches that connect at more than 100 trillion points. Signals travel through this “neuron forest” as tiny electrical charges, forming the basis of memories, thoughts, and feelings. As we lead our lives, our experiences create patterns in signal type and strength. Those unique patterns make us who we are, dictating how our brains code what we think and feel.

Why Alzheimer’s begins in an otherwise healthy brain is a question that remains unanswered. But we do know how

it proceeds. For people with the disease, the neuron forest becomes a battleground as nerve cells are killed and tissue is lost. As the brain shrinks, normal functions are disturbed and the cortex withers, particularly in the area that controls new memory formation.

Plaques, abnormal clusters of protein fragments, begin to build up between nerve cells. Twisted strands of proteins called tangles form, severely disrupting the brain’s cell transport system. Normally organized in parallel strands, the “tracks” of the transport system disintegrate in areas containing tangles. As a result, important nutrients can’t travel to the brain. As they spread throughout the cortex, plaques and tangles are thought to be the leading cause of cell death and tissue loss associated with Alzheimer’s.

The Stages of Alzheimer’s: What to Expect

The microscopic war waged within a diseased brain may not be apparent to the naked eye, but the fallout is visible. Signs and symptoms typically follow a pattern, and while the progression can’t be stopped or slowed, patients may take

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ADVICE**

**Routine and
Consistency**

“It’s important to focus on continuity of care and building routine into Alzheimer’s patients’ everyday lives. Consistency is key. For example, schedule a quiet time that includes dim lights and soothing music. With a monitored routine, there is a drastic drop in falls and sundowning.”

**Brenda Hixon,
RN, Executive
Director,
The Terrace at
Mountain Creek**



comfort in knowing what to expect so they can prepare for the future and maximize their quality of life.

Alzheimer’s disease is typically observed in stages. Medical experts and organizations have developed frameworks to track its progression. Depending on the source, stages within the various guidelines range in terms of number and name, but each provides a general idea of what occurs during the disease’s early, middle, and late phases.

According to the Mayo Clinic, there are five stages associated with Alzheimer’s. Preclinical Alzheimer’s disease, the first stage, can last for years and quite possibly decades. Symptoms are not yet apparent in people with preclinical Alzheimer’s, but the brain is already under attack. Thanks to new imaging technology, deposits of a substance called amyloid beta, believed to be associated with the disease, can now be identified in the brain before any mental or physical signs emerge. The ability to track



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Welcomes Dr. John Nash

After practicing orthopaedic surgery in the Chattanooga area for many years, Dr. John Nash joined the Center for Sports Medicine & Orthopaedics in August of 2013. His sub-specialty interests include hip and knee replacement, sports medicine, arthroscopy, and trauma.

He earned his medical degree at Harvard Medical School in Boston, Massachusetts where he cared for patients at the many excellent, affiliated hospitals throughout Boston including Massachusetts General Hospital, Brigham and Women’s Hospital, Beth-Israel Hospital, Children’s Hospital Boston, New England

Deaconess Hospital, and Dana-Farber Cancer Institute.

Returning to University of Southern California + Los Angeles County Medical Center (Keck School of Medicine of USC) for post-graduate training, he was awarded the “Orthopedic Intern of the Year” as well as recognition for his extensive research. After completing his residency, he found Chattanooga to be an ideal place to live.

Dr. Nash currently serves on the Board of Directors of the Memorial Health Care System and chairs their Quality Committee. He is also past Chief of Staff and serves as Chairman of the Credentials Committee.

Dr. Nash and his wife, Susan, are blessed with six children. They enjoy spending time with their family, participating in their educational and sporting events and a variety of outdoor activities.

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Prostate Cancer:

New Imaging Provides for Non-Invasive Detection, Staging and Improved Treatment Plans

In the past decade, digital mammography has revolutionized the world of breast cancer detection by providing radiologists with immediate, crystal-clear images and eliminating discomforts associated with traditional mammograms.

Dr. Joe Busch of Diagnostic Radiology Consultants is on the forefront of a similar technology: multiparametric MRIs for prostate cancer. Multiparametric MRI is a new technique in the detection and staging of men's prostate cancer.

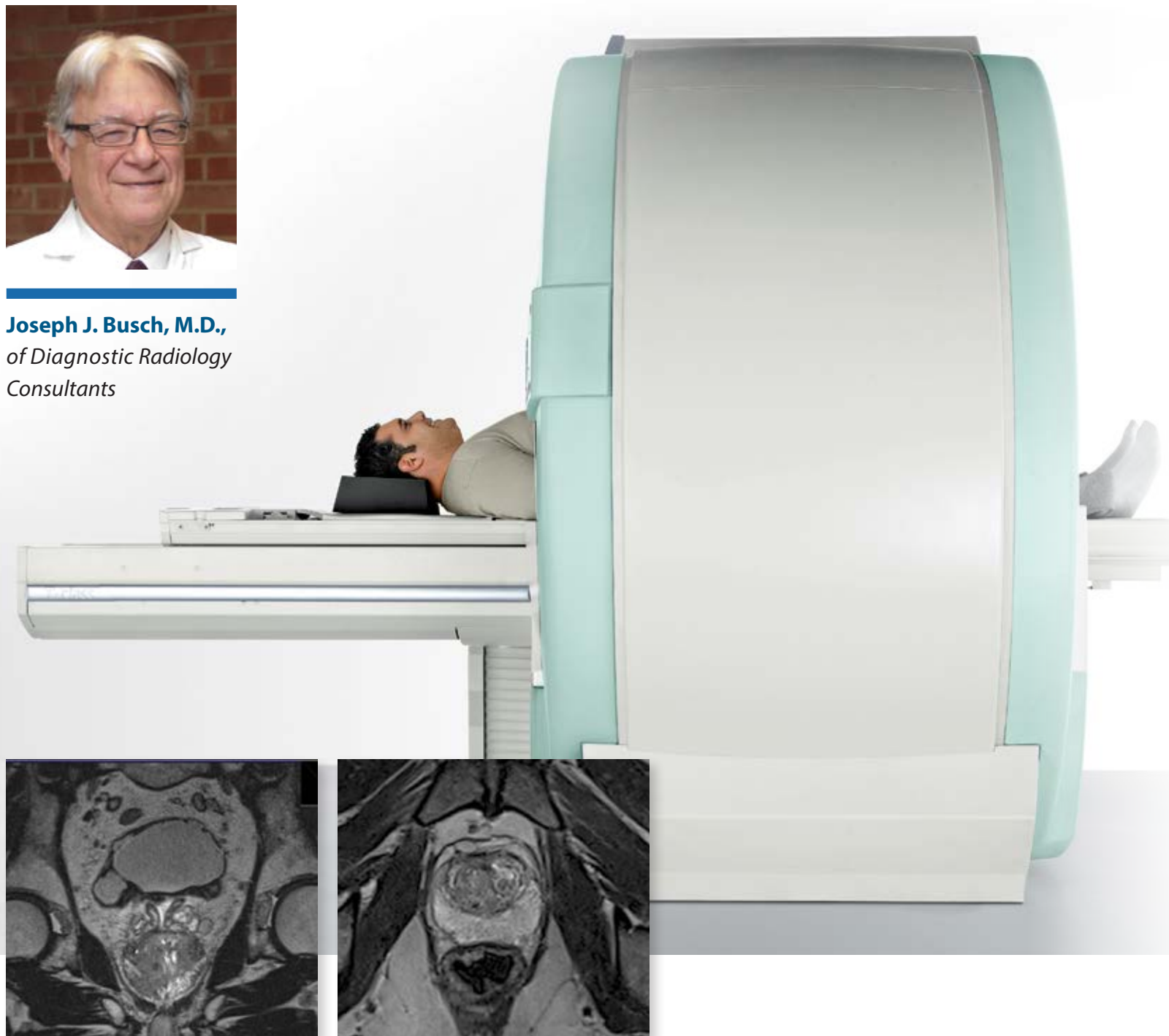
To date, Dr. Busch has screened 700+ patients using Diagnostic Radiology Consultants' Siemens 3T MRI scanner. Unlike its MRI predecessors, this cutting-edge scanner requires no invasive probes in the rectum and produces prostate images of unprecedented clarity.

An MRI for Prostate Cancer?

In the past, MRIs weren't technologically advanced enough to accurately detect and stage prostate cancer without the use of an endorectal coil. However, new high-field-strength scanners like the Siemens 3T feature twice the signal-to-noise ratio (SNR) as scanners of the past, allowing for imaging that can identify the grade and locations of cancerous tumors. Dr. Busch, a member of the International Prostate Working Group, joins radiologists around the world who have the ability to accurately determine if patients have an



Joseph J. Busch, M.D.,
of Diagnostic Radiology
Consultants



intermediate or high-grade cancer and to what extent their cancer is confined to the prostate gland. As an added benefit, the 3T MRI requires no endorectal coil, a significant factor in patient discomfort.

A Host of Applications

A multiparametric MRI is particularly useful for:

- **Active surveillance.** The non-invasive imaging can provide active surveillance for patients who may or may not have prostate cancer, allowing them to avoid uncomfortable invasive biopsies.

This high-grade imaging can be used to follow a man who has had a targeted biopsy revealing no cancer, but has an elevated PSA.

The multiparametric MRI can also be helpful for monitoring men who have been diagnosed with a slow growing cancer (low grade), but have been advised to "watch and wait" rather than be treated immediately.

- **Detection and stage.** According to Dr. Busch, the 3T MRI is extremely successful at identifying more serious cancers. In fact, it has a 95% rate of detecting high-grade cancers and a 90% success rate of detecting intermediate-grade cancers. If a man is suspected of having prostate cancer, this noninvasive procedure can be used with a high level of certainty to detect a significant prostate cancer.
- **Locating recurrence of previously treated cancers.** The MRI can reveal metastatic lymph nodes and/

or cancer that has spread outside the prostate to the skeletal system.

- **Locating prostate cancer with a previously negative biopsy and a rising PSA**—particularly in the anterior (or front) area of the prostate gland, an area that is difficult to reach for biopsies.

- **Clinical management.** The MRI can provide crucial information to assist with diagnostic efforts and targeted treatments. For example:

- The 3T MRI can help guide urologists to the correct location to biopsy, thus reducing the number of needles and potentially the number of biopsies needed to make a diagnosis.

- The 3T MRI can help urological surgeons and radiation oncologists to plan the appropriate therapy and create a personalized treatment plan that can involve surgery to remove the cancer, precise external beam radiotherapy, or brachytherapy—the implantation of radioactive "seeds."

Don't Wait to Be Screened

Between the multifocality of prostate tumors and the varying shapes of the prostate gland, prostate cancer can be challenging to detect and stage. Fortunately, the multiparametric MRI is a noninvasive tool for health care professionals to detect and effectively treat prostate cancer.

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Alzheimer's
Treatment

“Some medications can slow the progression of Alzheimer's by increasing the amount of a neurotransmitter called acetylcholine in the brain, which is thought to be deficient in patients with Alzheimer's. Another medication acts on a receptor in the brain and is believed to slow nerve damage. Keeping mentally active may also slow the progression of Alzheimer's.”



Nataria
Pitiyanuvath, M.D.,
Erlanger
Neurology
Group

these early changes has given researchers a better understanding of the disease's infant years, and it could be essential to the development of future treatments.

Mild cognitive impairment (MCI) due to Alzheimer's is the second stage of the disease. People with MCI experience small changes in their ability to remember and think. MCI also can interfere with decision-making abilities. Although noticeable, these changes typically aren't substantial enough to elicit concern or disrupt work and relationships.

In its third stage, mild dementia due to Alzheimer's, the disease makes itself known. Memory and thinking problems become apparent to the suffering individuals, as well as their family,



friends, and doctors. During this phase, people with Alzheimer's have trouble retaining newly learned information, problem-solving, completing complex tasks, and making sound judgments. Personality changes like irritability or withdrawal are common. The process of organizing and expressing thoughts becomes challenging, and people frequently get lost in familiar places or misplace things.

The next stage of the disease, moderate dementia, is associated with deepening confusion and forgetfulness. Assistance with daily activities becomes increasingly necessary—such as choosing clothes or using the bathroom—and personality changes continue to emerge. Restlessness, agitation, and aggressive outbursts are common. Severe dementia, the latest stage of Alzheimer's, is associated with a steep decline in health. Coherent communication is no longer possible, and constant assistance is required. Physical abilities begin to deteriorate: muscles become rigid, swallowing is impaired, and control of bladder and bowel functions is lost.

Recognizing the Signs

From gray hair to wrinkles, weight gain to swollen joints, the aging process certainly has its challenges. But the annoyance of sagging skin and sore muscles pales in comparison to the mayhem caused by Alzheimer's. As they approach their senior years, many people harbor an intense fear of the disease, and that's understandable. Saying good-bye to youth is hard enough; losing those memories—and the ability to create new ones—is difficult to bear.

However, it's important to keep in mind that occasional memory lapses are expected during any phase of life, and they do tend to increase as the years pass. Knowing the true signs and symptoms of Alzheimer's can hold fear at bay, giving you the ability to determine if there is any true cause for concern.

Alzheimer's causes consistent, increasing, and unprecedented behavioral changes that affect your day-to-day life. Forgetting the name of an old colleague, for example, isn't worrisome, but forgetting the name of your daughter is. Misplaced items, neglected finances, and challenges



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Dr. Apyan and Dr. Ingram are both board certified by the American Board of Orthopaedic Surgeons and have recently been recertified. They are both active faculty members of the University of Tennessee College of Medicine Department of Orthopaedic Surgery.



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using everyday objects and machines signal a problem. Getting lost in familiar territory—on your way home from the grocery store, for example—is another telltale Alzheimer’s symptom, as is repeating yourself constantly or asking the same questions over and over again.

If these behaviors appear and persist for an extended period of time, it’s important to seek the opinion of a medical professional who can dig deeper to find out whether an underlying issue exists.

**Healthy Living—
With Your Brain in Mind**

Currently, there are no known prevention strategies for Alzheimer’s. But there *are* ways to keep your brain healthy, which can either decrease your odds of developing the disease or delay its onset. Adults may reduce their risk by regularly participating in physical exercise. Keeping the brain active and engaged—through reading, puzzles or social interaction, for example—also

could be beneficial; activities that stimulate the mind strengthen brain cells and possibly create new nerve cells. There is some evidence that healthy eating may also have a role to play. Reduced intake of red meat and dairy, combined with increased consumption of fruits and vegetables, fiber-rich foods, and fish, could provide some protection against brain deterioration.

While these guidelines can help keep your body healthy, no one is immune to brain disease. Unfortunately, as is true with many medical conditions, you can do everything “right” and still develop Alzheimer’s.

**Treatment Options
and Managing Symptoms**

Although prevention and cures remain out of reach, treatment options have been developed. These approaches address the symptoms of Alzheimer’s, but are currently unable to slow its inevitable progression.


Today, there are four medications that have been approved by the U.S. Food and Drug Administration to treat Alzheimer’s. Three of these are used for patients with mild to moderate Alzheimer’s, and one is prescribed for patients in the moderate to severe stages. These drugs may help maintain some essential brain functions—thought, memory, speech—but they don’t impact the brain’s ongoing deterioration, they don’t work for everyone, and they may only be effective for a short time.

Some treatments, both drug and non-drug, focus on managing sleeplessness, agitation, depression, anger, and other behavioral symptoms. These medications and therapies can offer comfort and improve quality of life for sufferers of Alzheimer’s, while making it easier for family, friends and medical professionals to provide care.

Coping Now and Looking Ahead

Alzheimer’s is a complex disease that has gripped the lives of millions. As the number of people with Alzheimer’s continues to grow, medical and research institutions and organizations across the globe are increasingly committed to stopping the disease. In the meantime, resources are being funneled toward the development of new treatments that could potentially offset the Alzheimer’s or slow its attack.

If you or a loved one has been diagnosed with Alzheimer’s disease, your hands are not tied. Empower yourself by learning about the disease, understanding treatment options, and seeking professional advice or care. If you feel lost, start by taking advantage of the wide-ranging resources that are available online. Organizations like the National Institute for Aging (www.nia.nih.gov/alzheimers) and the Alzheimer’s Association (www.alz.org) offer extensive information and tools for patients, caregivers and healthcare providers.

Most importantly, don’t lose hope. As you prepare for whatever the future may bring, know that it still holds promise for a cure. 





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