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OPINION | COMMENTARY

Misplaced Hopes for Curing Alzheimer's

Scientific research will stop the disease. Coconut oil and marijuana won't.



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By **DAVID SHENK** And **RUDY TANZI**

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Alzheimer's disease affects 5.3 million Americans and is this country's sixth most deadly disease. It has existed for thousands of years and confounded scientists for more than a century. But that doesn't stop the dreamers from dreaming. Last week an Ivy League-educated friend shared some big news. "Have you heard?" he asked: Marijuana might stop Alzheimer's.

While neuroscientists, geneticists and biochemists have mapped out the disease's multi-causal nature and its immensely complex genetic-environmental interaction, the public seems determined to find an easy out.

This wishing isn't new. Thirty years ago the world quickly latched onto the false hope that aluminum in antiperspirant and cookware was the culprit behind Alzheimer's. Then came the cinnamon cure, the cayenne-pepper cure, the coconut-oil cure. The latest street buzz is to say "yes" to marijuana and "no" to gluten and carbs.

The crowdfunding website Kickstarter recently highlighted a documentary-in-progress called "Bread Head." The filmmaker

promised “a journey to the cutting edge of neuroscience” and “drug-free integrative approaches to dementia patients [with] stunning results.” People flocked to donate. It drew celebrity support and landed the filmmaker on “NBC Nightly News.”

But the real cutting edge of neuroscience is not a happy clinic of patients enjoying stunning prevention results with drug-free therapies. It is a room full of Ph.D.s soberly sharing painstakingly sequenced genomes, assayed enzymes, and isolated signaling molecules so that safe, effective new drugs can be created and tested.

Here’s what we do know based on decades of hard science: Alzheimer’s unfolds over many decades, as a protein called beta-amyloid proliferates in the brain—at first in healthy amounts performing vital functions, and eventually in excess. In most people (but not all), beta-amyloid then spurs the creation of destructive neurofibrillary tangles inside nerve cells. Tangles can also be caused by head injury or strokes. Subsequently, chronic inflammation does even more damage to brain tissue. Depending on a wide variety of factors, some people experience this buildup and cascade process faster than others.

Diet and lifestyle are not irrelevant: Exercise and sleep can lower risk, and foods that are bad for the heart are also bad for the brain. But the biggest lifestyle factor is age. Stubbornly, insidiously, Alzheimer’s becomes more threatening with every year that we get older. Nearly half of those over 85 have it.

At enormous expense and with support from dozens of labs, researchers today are aiming to synthesize a suite of drugs that will safely reduce beta-amyloid plaques, mitigate tangle formation and address inflammation.

For example, Biogen recently reported strong results in clinical trials of its drug aducanumab, which clears beta-amyloid from the brain. In April Duke University’s Carol Colton reported a promising new drug target for curbing inflammation.

The international research consortium at the Cure Alzheimer’s Fund recently funded a breakthrough experiment that was able to recreate full-blown Alzheimer’s in living human brain cells in a petri dish. Another consortium study identified a therapeutic avenue so promising that it drew a prestigious National Institutes of Health “Blueprint” grant for drug development all the way to clinical trials in patients.

Scientists are making progress but are likely still billions of dollars and years of research away from a true cure. Alzheimer’s health-care costs are more than \$200 billion a year, according to the Alzheimer’s Association, and will spiral past \$1 trillion as the population ages. Yet

the federal government last year spent \$591 million on research into the disease—a shamefully low investment compared with the scope of the problem.

Dreams for a quick, easy cure are understandable. Alzheimer's is a brutal disease, slowly degrading the minds of those who have it, devastating families who have to endure it, and terrifying everyone else. And it is hard for the public to feel connected to hyper-specialized scientists' molecular understanding of the disease. But the public needs to understand—and researchers need to better explain—that we will beat Alzheimer's *only* with its full-throated support of fact-based science.

Mr. Shenk is author of "The Forgetting" (Anchor, 2003) and Senior Adviser to Cure Alzheimer's Fund. Mr. Tanzi is chairman of the Research Consortium at Cure Alzheimer's Fund and professor of neurology at Massachusetts General Hospital/Harvard Medical School.

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