

Book Review

The End of Alzheimer's: The First Program to Prevent and Reverse Cognitive Decline, by Dale E. Bredensen, M.D., Avery, 2017, 320 p., ISBN-10: 0735216207.

As the Alzheimer's disease (AD) epidemic continues to escalate, this well-written and interesting book offers a valuable addition to the surfeit of books aiming to help people prevent and reverse cognitive decline. However, the subtitle of the book incorrectly suggests that it is the first program of this type. Another weakness of the book is that it focuses primarily on ten participants enrolled in a published observational study with no control group, suggesting that nine of ten improved. While it is mentioned on the book flap and elsewhere that hundreds of individuals have followed this program, these data are apparently unpublished. In contrast, the FINGER Study (Finnish Interventional Geriatric Study To Prevent Cognitive Disability), a large, multi-domain intervention study including diet, exercise, mental stimulation, and socialization, followed the gold standard of having a powerful control group and over 1,000 subjects for two years. Data from the FINGER study demonstrating that the intervention reduces multiple risk factors for AD have been published in many prestigious journals including *Lancet*, *Alzheimer's & Dementia*, and *The Journal of Alzheimer's Disease*; and presented at the annual Alzheimer's Association International Conference and at other important medical meetings around the world. FINGER is now further being studied in the United States and globally.

Now let's look at the book's content.

PART ONE: THE ALZHEIMER'S SOLUTION

The first four chapters review critical information about the genesis of AD. But a word of caution to amyloid hypothesis adherents, one drug approach supporters: the author does not endorse that theory and debunks it very well.

Onward, the discussion in this chapter is quite good at presenting the horrible tragedy of big-pharma investing billions of dollars in failed drug approaches. Chapter 1 concludes with the overview of the author's

theory that there are three brain protective responses that while trying to save the brain from injury actually cause AD: inflammation, nutrient deficiencies, and toxic exposures. What clearly shines through is the author's passion for his work. Chapter 2 describes a patient who did well on the program of diet, nutrients, exercise, stress management, and more as described later. In Chapter 3, we meet a patient who "came back from dementia." Signs and symptoms of cognitive decline the author uses to demonstrate the patient's recovery including facial blindness, impaired reading recollection and comprehension, and forgetting appointments, mirror the ten signs of AD proposed by the Alzheimer's Association.

Chapter 4 includes an excellent examination of how lifestyle factors clearly influences the development of AD, and how his protocol, called ReCODE, mitigates it by focusing on the big three, especially inflammation. Whether the author believes that one should refrain from taking prescribed drugs, such as proton pump inhibitors for ulcers or GERD (gastro esophageal reflux disease) and statins for elevated lipids is unclear although he says these drugs are part of an "Alzheimer's promoting lifestyle."

PART TWO: DECONSTRUCTING ALZHEIMER'S

Chapters 5 and 6 are great reading for a neuroscientist but quite difficult for a lay person. Indeed, the lay reader may simply skip these two chapters and go straight to the clinical program. For those with a scientific bent, these chapters include enlightening technical information supporting the author's theory of AD formation. He introduces 36 essential mechanisms that go awry in AD, what he calls "the 36 holes in the roof concept"; as well as the 54 positive protective lifestyle factors that may prevent cognitive loss. This chapter concludes by unveiling the tailored regimen to come—diet, exercise, sleep, stress reduction, and other lifestyle factors.

In Chapter 6, he rewards our patience with a rational (albeit highly scientific) picture of AD. He presents various genetic profiles that dramatically increase a person's risk of developing AD. Important questions he addresses include how ApoE4 promotes

the development of cognitive decline by shutting down production of certain molecules while activating others. He concludes by highlighting seven factors that can accelerate, slow, or reverse the development of AD.

With this background, he argues that AD is not a single disease, but actually three distinguishable syndromes, which explains why simply reducing amyloid- β —as drug companies have spent billions trying to do—will be ineffective. Finally, he explains why the ReCODE program, while not a one size fits all approach, is effective. He illustrates the efficacy of the program with success stories from patients with various types of AD.

PART THREE: EVALUATION AND PERSONALIZED THERAPEUTICS

Chapter 7 begins with what the author calls a “Cognoscopy,” or a complete evaluation of the factors that lead to AD. The fourteen “gold standard” evaluations run the gamut from genetic analysis to laboratory studies that gauge inflammation, hormone status, and fasting insulin levels. The assessment is uncommonly complete, including measures of heavy metal toxicities and diagnostic retinal scans. Practicing clinicians should study this chapter extensively.

The crux of the ReCODE program on reversing cognitive decline is presented in chapter 8. There are nine basic concepts—diet, exercise, sleep, stress reduction, meditation, brain-training, reducing inflammation, hormone balance, and eliminating toxins—many of them new and some of which have been discussed in other books.

Incongruously, he prescribes a ketogenic, plant based, low carbohydrate, diet combined with moderate exercise and fasting for at least 12 hours between your last meal of the night before and your first meal of the morning. This can be problematic for seniors with ulcer disease, however, since waiting so long between meals can cause substantial pain. Moreover, it may be difficult to remain in ketosis following this approach, as a ketogenic diet typically requires the consumption of large amounts of meat and other fats, while limiting many vegetables and fruits as they stop ketosis. He also suggests MCT (medium chain triglycerides) oil to help promote mild ketosis, which can be quite overstimulating for some people.

Importantly, however, there is scant evidence supporting a ketogenic approach to AD prevention or reversal. Conversely, there have been very strong

studies published in major journals recommending the Mediterranean, DASH (Dietary Approaches to Stop Hypertension), or MIND (Mediterranean-DASH Intervention for Neurodegenerative Delay) diets. These diets may slow or reverse memory loss through various mechanisms. Moreover, the Mediterranean diet leads to lower levels of amyloid- β plaques and greater thickness in the cerebral cortex. Bottom line? Any diet is much healthier than the Standard American Diet (SAD), which is laden with sugar, processed foods, and lacking antioxidant rich fruit and vegetables.

Altogether, there are fourteen aspects of this diet including a plethora of vitamins, digestive enzymes, and herbs, adding up to a hugely expensive and complicated, but potentially life-saving change.

Regular exercise also offers huge benefits for cognitive health although thorough instructions on following an exercise program are given short shrift. The author suggests working with a trainer or health coach, both potentially expensive propositions.

Sleep is another indispensable aspect of any optimal healthy living program. The author presents his three steps to optimize sleep: evaluating sleep apnea; getting eight hours of sleep, which may include taking melatonin or other supplements and hormones; and the practice of good “sleep hygiene.”

From sleep, the author segues into stress and meditation. This portion is by far the weakest aspect of the book, certainly deserving of a more comprehensive analysis. While the discussion on stress is reasonable, the fragment on meditation is woefully inadequate. Since 1975, with Benson’s initial description of The Relaxation Response, there have been over 40 years of research on the effects of meditation including enhanced cognitive function, little of which is detailed here.

Furthermore, scientific work published in this journal and elsewhere on a simple 12-minute yoga meditation practice called Kirtan Kriya, or KK, elucidates reversal of memory loss, improved cognition in those with subjective cognitive decline and mild cognitive impairment, and increased blood flow to significant brain areas concerned with memory. Additionally, studies on subjects in controlled trials practicing KK suggest an improvement in genetic function, including a down regulation of a factor called NF κ B. KK has also been associated with a substantial increase in an enzyme called telomerase, which may reduce cellular aging.

Next, the author moves on to the controversial topic of brain training, promoting a number of brain

training companies with programs that offer cognitively challenging tasks and games. Then comes further discussion on reducing inflammation utilizing his three-pronged approach: resolve, inhibit, and remove. He lists ten potential triggers to avoid, including non-steroidal anti-inflammatory drugs such as ibuprofen. Yet he offers no advice for how people might deal with chronic pain.

Next this extensive program discusses reaching optimal hormone balance and recognizes the hot debate in this area. Thyroid hormones, estrogen, testosterone, cortisol, DHEA, and pregnenolone are discussed. Although this is not the first book to do so, the presentation is very well done.

The final areas covered are metal homeostasis and toxins. Here he repudiates the medical dogma that metals are not involved in causing AD and presents various ways to detox including foods to eat, supplements to take, and soap to use.

Concluding chapters inspire, answer frequently asked questions, and provide an appendix including how to find a health coach, functional medicine practitioner, and seek out other aspects of the program.

This is a ground breaking book that belongs on the shelf of everyone interested in preventing and

reversing cognitive decline. But is this program just for people who have the financial means to afford it? What about those on a fixed budget, who rely on Medicare, or who otherwise cannot afford all the supplements and other costs associated with obtaining care from a functional medicine practitioner, who may not take Medicare or insurance or be able to spend a prolonged period of time with their patient?

Finally, as a physician and researcher with a lifelong interest in integrative approaches to healthy brain aging, I would hope that the author would more fully flesh out the section on meditation as a means to prevent and reverse cognitive decline and obtain the necessary funding to study this experimental protocol in a large, rigorous, controlled scientific study, similar to the FINGER study.

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