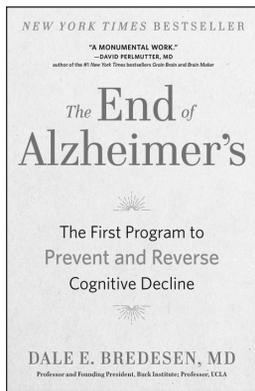


BOOK AND MEDIA REVIEWS

The End of Alzheimer's: The First Program to Prevent and Reverse Cognitive Decline

Dale Bredeesen

New York, Avery, 2017, 320 pp., \$27, hardcover



This is an important book. The health benefits of lifestyle change, including nutrition, have been known for a long time. Reducing the risk of heart disease, cancer, and stroke motivates many patients, but is not enough to result in a healthier population. Avoiding and

even reversing Alzheimer's disease is another matter. No one wants their life, or their loved ones', to end with years in dementia.

One in three Americans will develop Alzheimer's disease or another form of dementia by age 85.¹ UCLA Professor of Neurology Dale Bredeesen has shown that this does not need to happen. Alzheimer's disease and other forms of dementia are related to our nutrition and other lifestyle factors, even with the ApoE4 gene variant. This book shows that Alzheimer's disease can be prevented and even reversed if caught early enough.

Dale Bredeesen is a basic scientist and neurologist who worked in a lab studying the biology of Alzheimer's disease for over 20 years. Like many, he was hoping to find a single biochemical solution to this debilitating disease. In his book, he explains why that is not possible. As he learned, having Alzheimer's disease is like having a leaky roof with 36 holes. Fixing one will not solve the problem.

Fortuitously, his wife is a family physician trained in and practicing functional medicine. She told him the only solution to fixing Alzheimer's disease is to fix the lifestyle. He decided to conduct a clinical trial using intensive lifestyle change, and improvement of cognitive

decline followed. Bredeesen devotes a chapter to "patient zero" whose improvement was reported in 2014.²

Since then, Bredeesen has shown improvement or reversal of cognitive decline in over 200 patients. He reported on some of these in a follow-up paper.³ He describes how much trouble he had getting research funding for this work because he was not proposing a single solution. His protocol has been developed over about 5 years of study with patients and is called ReCODE (reversing cognitive decline) the Bredeesen Protocol 3.0. With this book and his websites, drbredeesen.com and mpicognition.com, he is training practitioners to provide the protocol around the world.⁴

Starting with evaluation of the patient, Dr Bredeesen recommends a thorough testing protocol that he refers to as a "cognoscopy." This includes a volumetric MRI, genetic testing, and thorough neurocognitive testing starting with a MoCA (Montreal Cognitive Assessment).⁵ Extensive laboratory work is recommended, including inflammatory markers. Bredeesen describes three subtypes of Alzheimer's disease: (1) Inflammatory (hot) includes those with the ApoE4 genotypes, (2) Atrophic (cold), and (3) Toxic (exposure to chemicals and infections). These types are clarified by the testing, and some patients, especially those with ApoE4 genotypes, have a combination of types 1 and 2.

The ReCODE protocol emphasizes nutrition but also includes exercise, sleep, and stress reduction. The nutrition is at least 12 hours of daily fasting to achieve ketosis and a fasting insulin level of 4.5 or less. Fasting blood sugar should be below 90 and hemoglobin A1c less than 5.6 percent. The food choices are a low glycemic Mediterranean diet with olive oil and lots of vegetables and whole fruit. Poultry and eggs should be pasture raised, other meat is grass-fed and used as a condiment rather than a main course. Seafood should be wild and to avoid mercury and other toxins, large-mouthed fish such as shark, swordfish and tuna are to be avoided. He recommends the "SMASH" fish: salmon, mackerel, anchovies,

sardines, and herring. Bredesen recommends many supplements, consistent with a functional medicine approach. I counted over 20 supplements, and Bredesen suggests a person does not need to start all of them at once.

The End of Alzheimer's is in many ways a victory for family medicine, and should be read by faculty and residents. I read the book twice to know all the details of ReCODE, and have started using it with patients. I have patients and residents reading the book, and we plan to start a practice at Eisenhower Medical Center with an emphasis in functional medicine to complement family medicine. Several of us will get formal training in the Bredesen Protocol 3.0. Reversing cognitive decline is a game changer for medicine and belongs in primary care.

Interestingly, two neurologists at Loma Linda University, a husband and wife team, direct the Brain Health and Alzheimer's Prevention Program at Loma Linda University Medical Center. They are also demonstrating reversal of cognitive decline with a similar lifestyle approach. The only real difference is that their diet is whole food plant-based, consistent with the Seventh Day Adventist vegan diet. All animal products are avoided. The only supplements recommended are vitamin B12 and fish oil. They also recommend cognitive exercises daily. Their book came out 3 weeks after Bredesen's.⁶ More research is needed to clarify what works, but the most important thing to know now is that cognitive decline is reversible, and lifestyle change is the answer.

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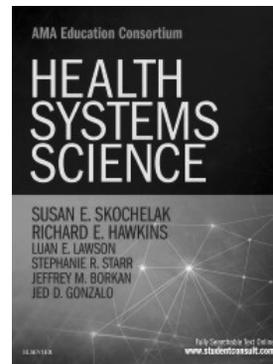
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Health Systems Science

Susan E. Skochelak and Richard E. Hawkins, eds.

Philadelphia, Elsevier, 2017, 228 pp., \$59.99, softcover



Since Abraham Flexner published his report on the state of American and Canadian medical education in 1910,¹ the pillars of medical education have been the basic and clinical sciences. Although in the past century both pil-

lars have experienced dramatic changes, this educational structure has remained the same. Increasingly, however, medical educators have recognized that mastery of the basic and clinical sciences alone is insufficient preparation for clinical practice. In the early 20th century, there were no health maintenance organizations, continuous quality improvement processes, clinical informatics, or population health management—all concepts that are essential for today's physicians to know.

In 2013, the American Medical Association formed the Accelerating Change in Medical Education Consortium, a group of 11 medical schools tasked with developing innovative curricula to encompass the additional knowledge, attitudes, and skills necessary to prepare students and residents for 21st-century practice. Although my home institution was not part of the consortium, as director of a required first-year course in health disparities and health policy, and as advisor for our population health scholarly track, I have followed its work with great interest. In a series of papers in *Academic Medicine*, consortium leaders proposed adding a third pillar of medical education called “health systems science.”²⁻⁴ *Health Systems Science*, an introductory textbook edited by Drs Susan Skochelak and Richard Hawkins and authored by 36 consortium participants (mostly medical doctors), describes the content and framework of this new field. Helpful features in each chapter include well-developed learning objectives, visually compelling graphics, illustrative case studies, questions for further thought, and an annotated bibliography.

The book's first two chapters introduce health systems science and explain why it

should be taught alongside the basic and clinical sciences. Defined as “the principles, methods, and practice of improving quality, outcomes, and costs of health care delivery for patients and populations within systems of medical care” (p. 11), its core curricular domains include health care structures and processes; health care policy, economics, and management; clinical informatics; population health; value-based care; and health system improvement. According to the authors, health systems science requires that a new generation of physicians “view themselves as part of an interprofessional care team, rather than as an independent autonomous provider,” and move away from the physician-centric role identity of the past toward a patient-centered, systems role identity (p. 6).

The remaining 13 chapters review each of the core curricular domains and their interactions with related topics such as leadership, teamwork, evidence-based practice, professionalism, scholarship, and systems thinking. Several topics (the health care delivery system, policy and economics, socioecologic determinants of health, and population health) receive relatively superficial coverage, while others (value, patient safety, and quality improvement) are discussed in greater depth. The chapters on team science and leadership in health care are well-focused, but the Application of Foundational Skills chapter is a grab bag of topics that didn't fit into other chapters: clinical practice guidelines, formularies, patient portals, and organizational culture. The Assessment chapter provides helpful tips for medical educators on measuring the health systems science performance of learners at different levels. Finally, a concluding chapter suggests structural reforms to make it easier to integrate this content into medical education, such as preferentially admitting students with well-developed teamwork skills, teaching with simulation and in community-based settings, and involving students in real-life practice improvement and health care delivery transformation.

Whether or not this collection of topics truly constitutes a new “science” rather than a blending of existing fields is debatable, but it is certain that in the future, more physicians will be caring for populations within health systems rather than individual patients one at a time. I decided not to adopt *Health Systems Science* as a required text for my first-year students due to its too-broad scope and

somewhat uneven quality. Those shortcomings aside, this book can still serve as an excellent starting point for medical school or residency educators who are planning courses or electives that overlap with one or more of the content domains.

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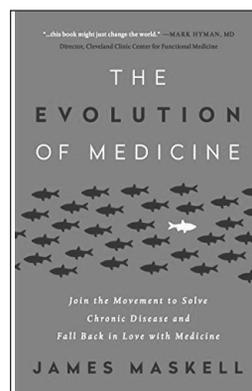
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The Evolution of Medicine: Join the Movement to Solve Chronic Disease and Fall Back in Love With Medicine

James Maskell

Bedford, MA, Knew Publishing, 2016, 152 pp., \$15.99, softcover



Burnout! A pandemic seems to be spreading across primary care.¹ For most physicians who have sacrificed considerably to become practitioners in the current system, a “holistic,” “complementary,” or “lifestyle medicine” approach often represents a philosophy

at odds with the science of traditional western medicine. Some progressive physicians, however, are rekindling professional fulfillment while overcoming stress and exhaustion through the abandonment of conventional medicine. In *The*

Evolution of Medicine, James Maskell proposes that physician burnout is rooted in our inescapable and increasingly antiquated system of medicine—a system that has not evolved in concert with the changes in environment, culture, and chronic disease. To overcome this inertia, Maskell describes exceptional systems and innovative leaders who have reversed primary care physician burnout through novel changes in how they influence health and wellness.

As the founder of the world's largest integrative medicine conference, "Functional Forum," Maskell has become a force inspiring a move from the current western medicine model toward a functional, wellness-centered approach. Maskell is not a physician, but holds a certificate in secondary education and is faculty at George Washington University's Metabolic Medicine Institute. Maskell describes how the paradigm of functional medicine can be transformative to both the provider and the patient, and therefore simultaneously address physician burnout and patients' chronic diseases. He does this in three distinct sections of his book.

In the first, Maskell provides a present-day exploration into the "functional medicine" model. Affirmingly to family physicians, he evokes how "early physicians were the centers of their communities, not only tending to disease but also educating patients in self-care, wellness, and disease prevention" (p. 15). He then efficiently, if not cuttingly, depicts a health care system that has evolved to increasingly value proceduralists and subspecialists focusing their narrow expertise on the all-hallowed diseases of an apportioned differential diagnosis. Furthermore, he states, "Though prescriptions, surgeries, and treatments can 'cure disease,' they aren't designed to be creating health" (p. 28). In Maskell's view, this industrialization of medicine and increased devaluation of the holistic care has created unintentional side effects exemplified by the aforementioned burnout and dissatisfaction of primary care physicians. Indeed, multiple studies attest to a situation where approximately half of primary care physicians would not repeat their career tract if they had the ability to do so. He positively reframes the challenge stating, "what doctors notice in and around hospitals and clinics is a lack of congruence between the way medicine is practiced and what they know to be health, which is cause for concern" (p. 27).

Quickly building from there, he goes on to illuminate the numerous areas where modern technology and communication systems can

prove integral in synergizing both provider and patient wellness. He describes Dr Leroy Hood's conception of "P4 Medicine," modeled on predictive, preventive, personalized, and participatory health care.² Maskell then inspires with multiple examples of high-level systems that have successfully incorporated and made reproducible P4 principles resulting in improved health for both patients and providers. These rock-solid anecdotes positively frame alternative ways to address chronic disease, and may even persuade curmudgeons that functional medicine might be more than just a touchy-feely pipe dream.

In the second section, Maskell describes effective ways for establishing and troubleshooting a functional medicine practice. This starts with chapter 4 where multiple educational resources are shared to assist a physician aspiring to a functional medicine path. In the next chapter varying business models are discussed, identifying their pros and cons in relation to starting a new functional medicine practice. Chapter 6 briefly addresses patient education and business marketing tools. These chapters are fairly brief, but effectively offer nuts and bolts solutions to building this type of practice framework.

In the last chapters, Maskell ties up some loose ends and recommends various next steps and inspiration for providers wishing to join the functional medicine movement. Reminding you that this section of *Family Medicine* is indeed "Book and Media Reviews," further examining functionalforum.com at this point is obligatory. If, as claimed, Functional Forum is indeed the world's largest integrative medicine conference, you can quickly see from the website how invested and professional this community has become. Opportunities for encouragement and networking abound through webstream events (with and without locally-scheduled meet-ups), podcasts, videos, newsletters, and resource links. Indeed, I find my dated definition of "conferencing" improved by the multiple clear, concise, inviting, and well-visited tabs within functionalforum.com that strongly support the motivated minds of inspired physicians through modern modes of communication and networking.

Ultimately, time will tell whether functional medicine will radically transform conventional medicine. For classically trained physicians who still find fulfillment in their work, Maskell's message may be viewed as a radical sales pitch for micropractices, organizations, and technologies that he promotes. Yet,

for bold, forward-thinking physicians who are burning out on the current mode of practice, investing in a wellness-focused practice may become a personally life-saving venture if not a tipping point for the entirety of health care. For this type of physician, Maskell's straight-forward guidance and motivation could prove motivational (at least) and positively life-altering (at best).

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