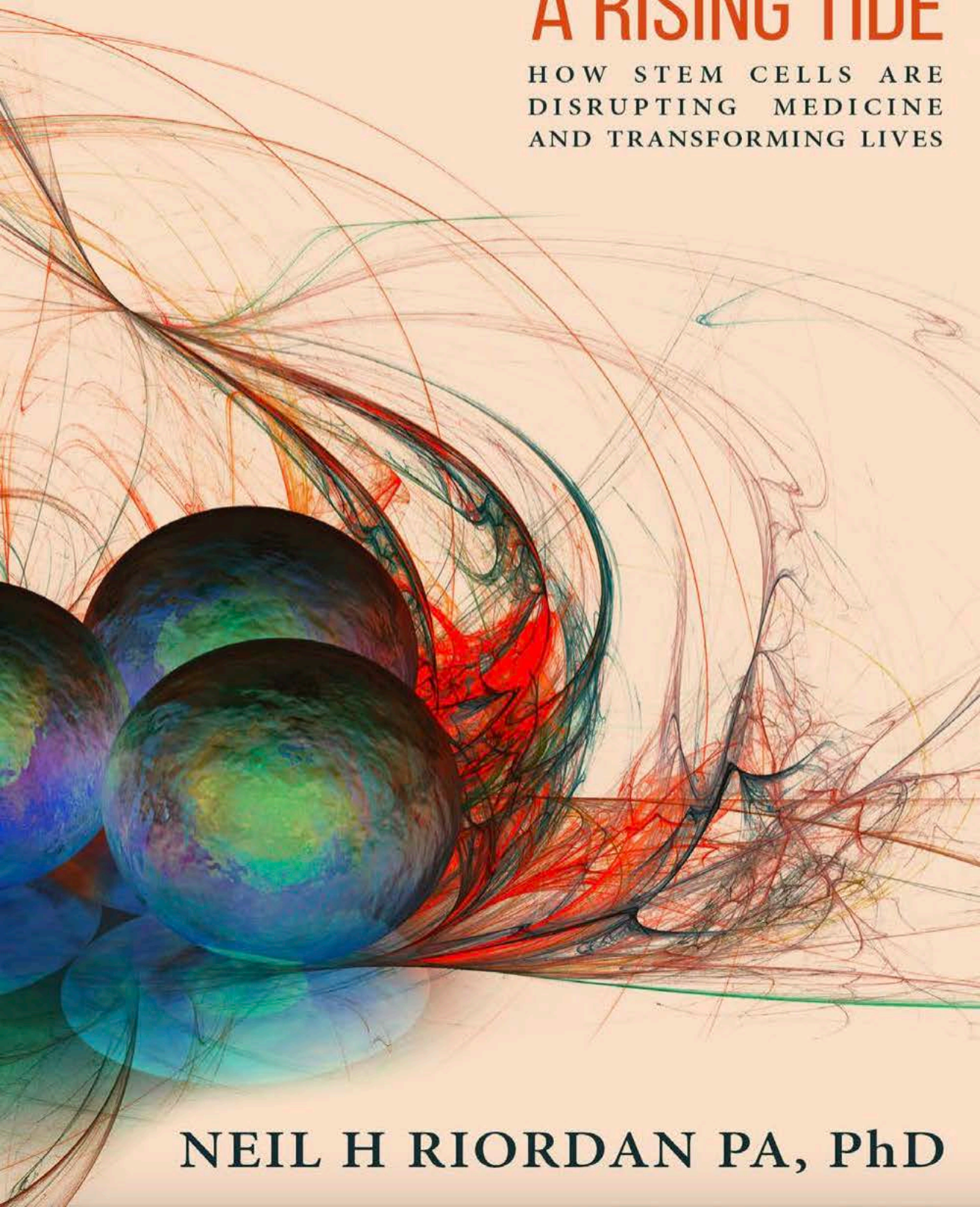
STEM CELL THERAPY

A RISING TIDE

HOW STEM CELLS ARE DISRUPTING MEDICINE AND TRANSFORMING LIVES



NEIL H RIORDAN PA, PhD

"Neil takes readers on a riveting journey through the past, present and future of stem cell therapy. His well-researched, educational and entertaining book could change your life. I highly recommend it."

Tony Robbins, NY Times #1 Bestselling Author

"100 years old will soon become the new 60. Stem cells are a key therapeutic to enable this future. Dr. Riordan's book is your guide to why this is true and how you will benefit. A must read for anyone who cares about extending their healthy lifespan."

Peter H. Diamandis, MD; Founder, XPRIZE & Singularity University; Co-Founder, Human Longevity, Inc.; Author of NY Times Best Sellers *Abundance* and *Bold*

Stem cells are the repair cells of your body. When there aren't enough of them, or they aren't working properly, chronic diseases can manifest and persist.

From industry leaders, sport stars, and Hollywood icons to thousands of everyday, ordinary people, stem cell therapy has helped when standard medicine failed. Many of them had lost hope. These are their stories.

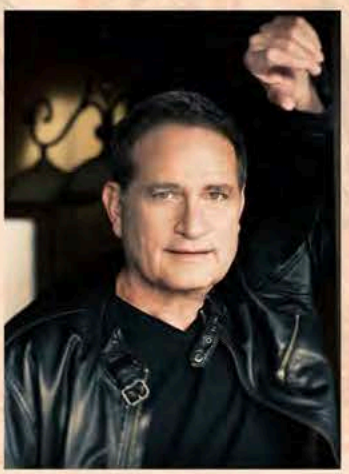
Neil H Riordan, author of *MSC: Clinical Evidence Leading Medicine's Next Frontier*, the definitive textbook on clinical stem cell therapy, brings you an easy-to-read book about how and why stem cells work, and why they're the wave of the future.

"I'm the luckiest guy in the world. Stem cells have given me my life back."

Sam Harrell – Football coach and Multiple Sclerosis patient

"I never want to go back to autism before stem cells."

Marty Kelly – Parent of a child with autism



NEIL H RIORDAN, PA, PhD

Neil H Riordan is an accomplished scientist and developer of regenerative medicine therapeutics, with more than 70 peer reviewed publications and more than 40 patents and patent applications to his credit. He is the author of MSC: Clinical Evidence Leading Medicine's Next Frontier, a groundbreaking compilation of stem cell studies for more than 30 medical conditions, with over 800 references to peer-reviewed articles. Dr. Riordan founded Medistem Panama, a leading stem cell laboratory and research facility that is ISO 9001 certified and fully licensed by the Panamanian Ministry of Health. He also founded the Stem Cell Institute in Panama, where his mesenchymal stem cell technologies continue to be implemented in patients, now numbering in the thousands, with autoimmune and degenerative diseases and injuries.

Stem Cell Therapy
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How Stem Cells are Disrupting Medicine and Transforming Lives

Neil H. Riordan

Stem Cell Therapy: A Rising Tide
How Stem Cells are Disrupting Medicine and Transforming Lives

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This book is not intended as a substitute for the medical advice of physicians. The information provided in this book is designed solely to provide helpful information on the subjects discussed. The reader should regularly consult a physician in matters relating to their health and particularly with respect to any symptoms that may require diagnosis or medical attention. While all the stories in this book are true, some names and identifying details have been changed to protect the privacy of the people involved.

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Foreword

As I read this book, I became very emotional. I had to go back about 28 years ago when my wife and I sat in a doctor's office and listened to a neurologist list in grim detail how our beautiful three-year-old son Ryan would spend his next 20 years. The doctor told us there was nothing that they could do at that time. He suggested that we do everything we could to keep Ryan active in order to maintain the strength he had as long as possible. And hopefully in the next 20 years they might find a cure for muscular dystrophy. The prognosis changed our lives forever. It was a very painful time for all of us.

As I continued to read about all of the patients who have been treated by Dr. Riordan, I realized that we all had one thing in common: traditional medicine had given up on us. There was nothing that could be done. Our own government, founded on the premise of life, liberty, and the pursuit of happiness, had evolved into overreaching bureaucracy that would attempt to prevent us from seeking lifesaving alternative treatments.

But once again, we all had something else in common. We found a man who was willing to do everything in his power to offer us options and give us hope for the future of our loved ones. Dr. Riordan has truly dedicated himself to his profession as a medical pioneer. He has sacrificed everything he has to give those who have been told there are no options a fighting chance and real hope for the future.

Dr. Riordan has never wavered in the face of scrutiny. It takes true courage to stand up to the often judgmental "traditional" medical community—those who act offended when you suggest that there might be a different way.

Fortunately for all of us, Dr. Riordan had the foresight to look beyond the walls of traditional medicine and fight the fight for us. I encourage you to read this book, and not just the chapters related to your condition. As a whole, the book lays out Dr. Riordan's courageous and successful journey through his stories and the stories of his patients.

Thank you, Dr. Riordan, for all that you have done for us and our families. You truly are a hero!

George Benton, Ryan's father

Introduction

BY ARNOLD CAPLAN, PHD

Neil Riordan, PhD, PA is a pioneer of the highest order, in some ways like John Glenn or Neil Armstrong. Neil has ventured where the routes were uncharted and the dangers huge. His rocket of cell therapy was launched on a rickety platform filled with hopes and dreams, and powered by an engine of money. This pioneer has hacked his way through the jungle of naysayers and has produced miracles of enormous proportions. He has taken our scientific dreams and translated them into a high-caliber medical facility that does good by offering exposure to cell therapy treatments that we working scientists only dream about.

Although there are those in my professional realm who would say that Neil is a medical "cowboy" who "experiments" with human subjects, I would say that he is providing access to therapies that are no more experimental than one sees every single day in the surgical suites of major medical centers. In such situations, the surgeon is "forced" to improvise because of the complexity of the wound field. Such improvisation sometimes involves using materials that are not approved but that the surgeon "feels" will work well in the situation he faces. For example, human decellularized skin from dead people was approved for topical applications for ulcerated wounds in diabetic patients. But these "membranes" are fabulous for closing abdominal surgical wounds in hernia repair operations and have changed the way such closures are done. This surgical improvision, originally performed by a "cowboy" surgeon, is now the standard of care. We move forward in medicine by the skill and insightful work of pioneers—some with IRB approval and some not. Riordan's procedures with MSCs currently have IRB approvals.

In a sense of transparency, let me say that I have accepted honoraria from Neil Riordan and gifts of hotel rooms, meals, and, indeed, infusions of MSCs. These all have monetary value, but none influences my opinion. The monetary success of Neil's enterprises evoke jealousy in some entrepreneurs, but Neil's continual reinvestment of money into his next medically successful enterprise displays his true motives—the advancement of a medically necessary science despite great obstacles. The key to his success is in the enormously high quality of his facilities; the people, doctors, nurses, receptionist, PR team, etc. are *all* highly principled and care about the patients they serve. These people care about what they do because Neil recruits them for their skills and attitude. He does not discuss this in this book, but they are present on every page. He talks about Dr. Paz, but he does not tell you of his long medical experience and his reputation in the United States and in Panama for caring and experienced medical judgements. In all of Neil's clinics, quality control labs, hotels for patients, and restaurants where they eat, the staff behind the scenes are dedicated to providing the highest quality medical care possible. Some clinics and hospitals in the United States could take lessons from the Riordan gang. That said, the cell-based therapies Neil's clinics provide have not all been approved and tested by double-blind, placebo control and rigorously monitored clinical trials, although such trials are currently underway. But, like innovative surgeons, these open-label uses have proven effective, as hopefully we will see in published peer-reviewed reports of his studies.

Each chapter of this book recounts the personal stories of how Neil's unwavering confidence that cell-based therapies with MSC preparations from fat, marrow, or umbilical cords can make a medical difference. Neil made medical tourism work, and what he has done is highly laudable, not only because of the patients he has helped, but because of the laws that have been written to support cell-based therapies in Panama. This book is not what I pleaded with Neil to write, however. I have, for many years, begged him to give us outcome reports of his many patients: what they have as clinical problems, what they walk in with, and the longitudinal outcomes after the cell infusions. Hopefully these will be forthcoming, but they are not in this book. What is here in these pages is, none-the-less, amazing.

I first learned about Neil's clinic in Costa Rica and thought his procedures and therapies were brilliant. And these were crude compared to those currently underway in Panama. The Panama GMP-production facilities, his offices and treatment rooms, and the products including MSCs from umbilical tissue are of the highest quality. These are the vehicles and the platform that allow him to write this treatise of the therapies they provide. It is a shame that we have to fly to Panama to have access to these therapies instead of having them available in the United States. How long will it take for such therapies to be available to the patients covered by Medicaid or Medicare instead of those from Beverly Hills or Long Island who can afford to travel to Panama?

Almost daily I receive emails from people who want access to "stem cell" treatments. I tell them that I am just a PhD researcher and cannot suggest an avenue of treatment for medical issues. If you have this book in hand, read the chapters. They are honest, open, and spellbinding. While Neil is not a medical doctor, his clinical experience as a physician assistant along with his research background have prepared him for the serious medical issues for which Neil has organized cell therapy treatments, often with quite significant outcomes. Neil is certainly a student of the medical arts and an expert using innovative treatments. I have talked to patients of Neil's clinics and their family members about their treatments; the stories told in this book are just the tip of the iceberg. This is an interesting book and an interesting and gutsy journey of Neil Riordan. His physician father would be proud to recognize Neil's passion and medical achievements.

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January 15, 2017

Chapter Sixteen

LUPUS— AN OPPORTUNITY IN AUTOIMMUNE HEALTH

Lupus is the common name for lupus erythematosus, of which there are four types. One type, systemic lupus erythematosus (SLE), is the most common and serious form. SLE is a chronic autoimmune disease in which the immune system attacks the body's own tissues and organs—any area of the body can be affected, including the joints, skin, kidneys, heart, lungs, blood vessels, and the brain. Sometimes called "the great imitator" because of the many body systems affected and varying symptoms, lupus can mimic other conditions, making it difficult to diagnose. Common symptoms, which tend to come on slowly, include pain or swelling in the joints, muscle pain, fever with no known cause, red rashes—especially on the face, chest pain, hair loss, poor circulation in the fingers or toes, sun sensitivity, swelling in the legs or around eyes, mouth ulcers, swollen glands, and fatigue.

I became interested in lupus after learning about the research of Lingyun Sun, MD, a doctor in China who was researching the use of mesenchymal

stem cells for lupus. He began with a mouse model of lupus and then treated a series of four people who were not responding to six months of antibiotic and steroid treatment.[1] Both the mice and humans received donor bone marrow MSCs. The humans were slowly weaned off of the antibiotic over the next six months while maintaining a low dose of the steroid medication. The patients' kidney function, survival, and disease remission improved. Dr. Sun also cultured the patients' own bone marrow MSCs to study their robustness. They were found to have an impairment in their ability to form bone. This deficiency comes along with impaired ability to produce T-regulatory cells, key for keeping the immune system in check. These cells are often decreased in patients with autoimmune diseases.

Dr. Sun's next study followed 15 patients with severe lupus who were also treated with bone marrow MSCs.[2] There were no serious side effects of the treatment, and their disease activity scores improved after one, three, 12, and 24 months; protein in the urine improved, and so did the amount of circulating T-regulatory cells. Next, Dr. Sun used umbilical cord MSCs from healthy donors instead of bone marrow MSCs in patients with lupus who were not responding to treatment and who had life-threatening organ involvement.[3] "Significant reduction in disease activity was achieved in all patients, and there has been no recurrence to date and no treatment-related deaths."

In yet one more study, four patients with a lupus-derived severe lung complication that has a 50 percent mortality rate, meaning that 50 percent of patients with this condition do not survive it, were treated with umbilical cord MSCs.[4] The four patients not only survived but improved dramatically. In his latest article, Dr. Sun's team summed up four years of treating 87 patients with severe SLE.[5] The complete clinical remission rate at one year was 28 percent, 31 percent at two years, 42 percent at three years, and 50 percent at four years. Overall relapse rate was 23 percent. No transplantation-related adverse events were observed.

Despite Dr. Sun's success with treating severe and refractory lupus with MSCs, research into the use of MSCs for lupus has been scant. I am extremely excited to recently have seen a six-university trial using umbilical cord mesenchymal stem cells for the treatment of lupus. This study has

been a long time coming and is historic, I believe, for the research of these cells in the United States. It is sponsored by the Medical University of South Carolina, one of the trial locations.[6] Additional sites are Cedars-Sinai Medical Center in Los Angeles, the University of North Carolina at Chapel Hill, the University of Rochester Medical Center, Northwestern University in Chicago, and Emory University in Atlanta.

This trial will evaluate umbilical cord MSCs along with standard of care treatment as compared to a placebo infusion along with standard of care in adults with SLE. The potential for treating this difficult condition with MSCs, especially in severe cases, is huge. I hope that more researchers and doctors pay attention to Dr. Sun's research and to the clinical trial currently underway so that more patients will eventually have access to this treatment.

We have not treated patients with lupus at the Stem Cell Institute largely because of my early ignorance before learning about Dr. Sun's research. You see, in medical school we learn that the immune system has two branches that act in balance—when one side is dominant, the other is dampened. I am referring to the Th1 and Th2 immune responses. People with rheumatoid arthritis or multiple sclerosis have a strongly exaggerated Th1 response, which stem cells help to quell. Because it was understood that lowering a Th1 response would potentially raise the Th2 response, and that people with lupus experience an exaggerated Th2 response, I wrongfully assumed that stem cells would not benefit people with lupus because they would favor a Th2 immune response. It was a counterintuitive treatment, so it was off the table. But Dr. Sun's research, as well as the discovery that the Th1-Th2 immune responses are also balanced by Th3 as well as Th17, and probably most importantly by increasing the number of T-regulatory cells, the "mothering cells of the immune system," has changed my opinion about treating lupus with stem cells.

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