


Mindful Exercise

Metarobics, Healing, and the
Power of Tai Chi



A revolutionary
new understanding of why
mindful healing works

PETER ANTHONY GRYFFIN, PHD

Forewords by Roger Jahnke, OMD,
and Bill Douglas, founder of World Tai Chi & Qigong Day

Today, more doctors than ever are prescribing tai chi for patients recovering from injury, illness, and surgery.

"A persuasive picture of tai chi's healing effects bolstered by compelling data and enlivened by an array of personal testimonials." —Kirkus Reviews

"Will surely become 'the prescription' of choice for all responsible medical providers! I am enthusiastic about recommending it!"

—Roger Jahnke, OMD, author of *The Healing Promise of Qi*

"Mindful Exercise and the metarobic approach opened my eyes, and they can open yours too."

—Dr. John Day, author of *The Longevity Plan*

"Merges meditation and exercise ... may well lead to a new definition of optimal well-being."

—Rudolph E. Tanzi, PhD, professor of neurology, Harvard Medical School; *New York Times* best-selling author of *The Healing Self*

"A portal that will change the way tai chi and qigong are approached; modern medical science can join hands with these ancient mind-body sciences to become coevolutionary."

—Bill Douglas, author of *The Complete Idiot's Guide to Tai Chi & Qigong*

This book presents over ten years of research into how and why tai chi benefits health from an evidence-based, medical perspective.

Dr. Peter Anthony Gryffin demonstrates the link between health and metarobics, his term for slow, meditative exercises that enhance blood oxygen saturation, diffusion, and oxygen-based metabolism. Metarobics—including tai chi, qigong, and yoga—focus on relaxation and deep breathing. Dr. Gryffin's research shows that these exercises offer a wide range of benefits for treating chronic disease.

Dr. Gryffin cites numerous scientific studies as well as testimonials from patients who have experienced the natural healing benefits of metarobic exercise. Many have surmounted chronic health problems to improve their quality of life. Some even overcame grave diagnoses.

This book features

- More than 120 scientific studies on tai chi and other metarobic exercises
- More than 50 case stories from tai chi, qigong, and yoga practitioners
- Clear, straightforward language
- Tested guidelines to improve your metarobic exercise and maximize health benefits

Dr. Gryffin says, "The links I discovered will allow everyone from novice students to veteran teachers to maximize benefits for health and chronic conditions."



PETER ANTHONY GRYFFIN, PhD, MS, has over thirty years of experience with tai chi, qigong, and yoga. His research includes implications related to hypoxia, cancer, and tai chi; the development of the theory of metarobics; and the application of mindfulness-based practices for dealing with stress, trauma, addiction, and destructive behavior. Dr. Gryffin holds a PhD in health and human performance and a master's degree in kinesiology and health. He resides in Los Angeles, California.

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Praise for *Mindful Exercise*

“*Mindful Exercise* lays a foundation from a Western perspective of how and why tai chi and similar exercises can benefit a wide range of conditions. Peter Anthony Gryffin’s approach will bring wider appeal to these profound practices without denying their cultural roots. Over 120 studies are presented, supporting his research of metarobic effects, while more than fifty case stories give the book a personal approach. This book does an excellent job of presenting a physiological understanding of tai chi and other mindful exercises, laying the foundation for a new area of study in the field of health and fitness. If you suffer from a chronic condition, *Mindful Exercise* offers new avenues to health to discuss with your doctor. And if you seek a powerful tool from an ancient tradition for enhancing your longevity, this may be it. *Mindful Exercise* and the metarobic approach opened my eyes, and they can open yours too.”

—Dr. John Day, cardiologist and medical director of Heart Rhythm Specialists at Intermountain Medical Center in Salt Lake City, Utah;
author of *The Longevity Plan*

“Peter Anthony Gryffin eloquently merges two of the best things you can do for your body and mind—meditation and exercise—into a single daily regimen that may well lead to a new definition of optimal well-being.”

—Rudolph E. Tanzi, PhD, professor of neurology, Harvard Medical School; *New York Times* best-selling author of *The Healing Self*

“It is great to see a tai chi practitioner with a clinical background taking a new approach to this traditional exercise. [Peter Anthony Gryffin’s] work will contribute to the development of tai chi for people’s benefit.”

—Paul Lam, MD, author of *Teaching Tai Chi Effectively*;
founder of the Tai Chi for Health Institute

“Metarobics is a new spin on validated evidence-based research on the healing abilities of tai chi, qigong, and yoga. This approach is excellent. [Peter Anthony Gryffin’s] research and anecdotal vignettes supporting these practices will have a positive impact on health, with the idea of oxygen perfusion being a vital component for their healing abilities.”

—Denise DeForest Pastoor, MEd, APRN, CS, CHTP/I, CWP, RYT

“Peter Anthony Gryffin does an excellent job of blending Eastern forms of exercise and energy work with Western science and modern medicine. This book is a compelling read for those interested in boosting their health and wellness in our modern time.”

—Lee Holden, qigong teacher; PBS favorite presenter; author of numerous books and videos including *Introduction to Qigong Exercises*

“Dr. Gryffin does an excellent job of highlighting the science behind the ‘mind-body connection.’ As the fitness director for a very large retirement community, I have found tai chi to be a very important and valuable component of our wellness curriculum. This book validates all the well-known and sought-after tai chi benefits. We highly encourage our residents to participate in tai chi for all of the fall-risk-reduction and stress-relieving benefits. I am now able to articulate the outcomes of Metarobics and why ‘the unique way the body responds in relationship to oxygen during slow relaxed movements’ is so important to overall health. I highly recommend this book to anyone who teaches or administers wellness programs. The evidence from Dr. Gryffin’s case studies is extremely provocative and very inspiring.”

—Cammy Dennis, fitness director of On Top of the World
(A 55+ active adult community)

“*Mindful Exercise* is a masterful work that fills gaps in our knowledge base of tai chi and answers important questions. Tai chi and qigong players know that they feel wonderful after a class. They have minimized and even eliminated various ache and pains, both physical and emotional. In *Mindful Exercise*, Dr. Gryffin gives us the ‘why.’ Why is it

that simple movements coupled with focused breathing help us with so many health benefits? His answer: Metarobics.

“Using dozens of stories of people who have had their lives enhanced by tai chi and qigong, *Mindful Exercise* helps us understand Metarobics. We can now understand how the relaxed body, aided by abdominal breathing, enhances our health in a variety of ways.

“Students of tai chi and qigong, as well as other mind-body disciplines, will find *Mindful Exercise* an important work to add to their personal libraries. Instructors of the healing arts will add to the value of their classes by sharing the information in Dr. Gryffin’s eye-opening work. I know I will.”

—Arthur Stalbow, tai chi qigong instructor, On Top of the World Community, The Ranch Fitness Center, Stone Creek Community, Cherrywood Community, Health 2 You Senior Fitness, all in Ocala, Florida

“Dr. Gryffin presents an understandable Western perspective on tai chi, qigong, yoga, and other Eastern disciplines. The language and the argumentation used to explain the benefits of these disciplines from an Oriental perspective have been, in many cases, something quite mysterious and difficult to verify from the Western perspective. The advantage of Metarobic theory is that it can be accompanied by a fairly simple system of testing: the use of an oximeter during the execution of these exercises. The finding that a ‘metabolic’ or Metarobic mode of doing these exercises directly affects the oxygenation, oxygen diffusion, and metabolism of the body is in itself very important. *Mindful Exercise* establishes the relationship between hypoxia, oxygen diffusion, and the evolution of different diseases such as cancer, heart disease, arthritis, diabetes, and more.”

—Dr. Juan Carlos Cernuda, professor of educational sciences at the National University del Litoral, Parana, Argentina; author

“This book is a landmark melding of East and West and the art of tai chi. For too long, the understanding of this unique form of exercise and

healing has been obscured by divergent schools and secretive practices. *Mindful Exercise* combines testimonials, a wide range of research, and dedicated original writing. It respectfully conveys a modern approach to an ancient art. This is an important book for anyone thinking of starting a tai chi practice or for practitioners who want to understand the therapeutic potential of this meditative training.”

—Deng Ming-Dao, practitioner of xingyiquan, baguazhang, and taijiquan; author of numerous books including *365 Tao: Daily Meditations*

“Dr. Peter Anthony Gryffin’s theory of Metarobics—a new category of exercise that focuses on a dynamic state of relaxation and enhanced respiration found within the slow movements of tai chi, yoga, and qigong—may provide a key to preventing and fighting various illnesses and degenerative diseases. In this unique book, Dr. Gryffin explains why Metarobics should be included along with aerobic exercise and strength training as vital elements to health and fitness. *Mindful Exercise* is an interesting and informative read for anyone interested in health, aging, and longevity.”

—Alain B. Burrese, fifth dan, Hapkido; best-selling author of numerous martial arts books

“I thought I already had a whole checklist of good reasons to practice and teach tai chi chuan. After reading the manuscript for Peter Anthony Gryffin’s new book, *Mindful Exercise*, I feel I’ve now added several additional and compelling reasons to that list.

“This book amounts to nothing less than a brilliant, and very welcome, treatise on its subject matter. *Mindful Exercise; Metarobics, Healing, and the Power of Tai Chi* casts new and important light and credence on tai chi and qigong, et al. as health and wellness disciplines that now enjoy a credible scientific basis to their long-standing empirical status. This book’s content is precisely what tai chi teachers have long been waiting for: a comprehensive body of mainstream evidence-based claims with the potential to shift both the reality and the public’s

and medical community's perception of tai chi from its former realm of New Age curiosity to a bona fide health and wellness resource."

—John Loupos, MS, Hanna Somatics Education, tai chi instructor;
author of numerous books including *The Sustainable You*

"This book will awaken the interest of readers and provide motivation to seek mindful exercises to benefit their health. *Mindful Exercise* is easy to read with powerful information that can have a life-lasting impact. I am certainly motivated to find a tai chi class in my community."

—Guillermina Solis, PhD, APRN, FNP+C, GNP-C, University of
Texas at El Paso School of Nursing

"In this debut mind/body guide, a tai chi instructor details the unique physiological benefits of the technique's slow-moving exercises. For tai chi instructor Gryffin, what has been 'missing in the research' in studies of the wellness/healing power of tai chi and similar exercises (qi gong, some forms of yoga, etc.) 'was why these exercises were having such benefits.' Here, he seeks to remedy this perceived gap by presenting research supporting his observations that, in conjunction with slow abdominal breathing, these kinds of exercises can relax the body and enhance blood oxygen saturation, diffusion, and metabolic function. Such enhancements create an 'effect unique from other forms of exercise' to prevent or combat hypoxia, a reduction in the amount of oxygen reaching various areas of the body, a condition that can lead to cancer; heart, kidney, and lung diseases; stroke; asthma; diabetes; and other chronic ailments. Given tai chi and similar activities are neither aerobic nor strength-based, Gryffin coins these exercises 'Metarobics' and asserts that they deserve the same kind of attention and uptick in popularity that aerobic exercises have achieved. Alongside his research discussions, first detailing the overall physiological effects, then going deeper into specific health conditions, Gryffin includes an array of first-person testimonials regarding these exercises' lifesaving effects and psychological benefits. Debut author Gryffin, who holds a PhD in health and human performance from the University of

Florida, makes a convincing case to draw more people to both practice and advocate for Metarobics. He includes an extensive reference list to support his assertions and is careful not to tout his ideas at the expense of traditional medicine; at one point, for instance, he notes that boosted oxygen around tumors allows for more efficient chemotherapy treatments. The various testimonials, some 50 in all, also support his cause while offering readers relief from the occasionally dry, repetitive detailing of data.”

—*Kirkus Reviews*

*A persuasive picture of tai chi's healing effects
bolstered by compelling data and enlivened
by an array of personal testimonials.*

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Foreword

I AM VERY EXCITED ABOUT THIS book and the Metarobics framework! The Institute of Integral Qigong and Tai Chi (IIQTC) has been committed to supporting the ancient insights regarding mind-body practice to be articulated for contemporary culture. While traditional concepts from former eras have incredible power, the magnitude of their influence is dramatically increased when those concepts are translated into contemporary terms.

As a practitioner with over thirty years of clinical practice as a physician of traditional Chinese medicine, I can say that the approach presented in this book is respectful of the profound ancient traditions of mind-body practice in original cultures—China, India, and other indigenous shamanic communities. Simultaneously, this exploration of Metarobics creates an understanding that will inform science and inspire the public to better understand the profound benefits of mindful forms of exercise, which maximize the mind-body interaction. I have taught and researched the Chinese self-cultivation arts for many years, having learned over several decades from numerous master teachers in dozens of visits to hospitals, institutes, and training centers in China. Amazingly, there is an almost limitless and miraculous potential to these arts from which to create powerful programs for health and wellness—for all populations, with both personal and socioeconomic benefits.

I stated in my books, *The Healer Within* and *The Healing Promise of Qi*, that contemporary culture has only begun to explain the benefits of qigong and tai chi in terms of our Western-culture-centric science. *Mindful Exercise* takes this a leap further and presents a physiological understanding of how and why many of these benefits occur. The research evidence base is exploding for a variety of conditions, including

potential benefits for cancer; heart, lung, and kidney disease; diabetes; chronic pain; asthma; arthritis; and immunity—the list of potential benefits is stunning. Yet Dr. Gryffin shines the light of contemporary science without detracting from the depth and profundity of these traditional arts.

Disseminating the ancient arts of qigong and tai chi (as well as yoga) is in many ways a radical breakthrough, one that is transforming health care (self-care) and the delivery of medical intervention. The Metarobic concept, as presented by Dr. Gryffin, makes this breakthrough much more understandable to modern medicine and much more approachable for a widening public audience. This excellent book taps the physiological essence of the human-potential arts, which actually have their foundation in the physics of the boundless universe and its ultimate energetic nature.

Tai chi and qigong are wonderful and inspiring treasures of ancient culture that create subtle changes within the human system—to naturally produce what we at the IIQTC call “the most profound medicine.” This medicine, referenced in the ancient literature as “inner elixir,” is produced within the body—*for free*. In Dr. Gryffin’s Metarobic approach, hypoxia (the deficiency of oxygen in the cells) parallels the basic ingredient and functional agent of the Chinese paradigm qi. The reader is treated to a measurable and scientific understanding of how and why these Metarobic practices create such significant benefits for health maximization and disease prevention. As noted by Dr. Gryffin, hypoxia underlies or complicates almost every chronic condition and illness experienced by the body, just as qi deficiency underlies almost every disease in Chinese medicine. The best news, the “inner elixir” is the ultimate nonpharmacological medicine—produced within the human system for no cost!

Dr. Gryffin does an excellent job laying a foundation for a much-needed area of citizen empowerment: self-initiated health maximization. There is an incredible power to bringing quantifiable metrics to bear on how and why Metarobic methodologies benefit health, while respecting their traditional roots and origins. Based on my experiences,

along with colleagues and fellow researchers Linda Larkey, Jennifer Etner, and Julie Gonzalez, we identified a need to define a new category of exercise: meditative movement. *Meditative movement* is an umbrella construct for forms of exercise that incorporate meditation and purposeful breath regulation from a Western scientific perspective. The Metarobic approach to mindful exercise corroborates this, adding to the growing body of work related to meditative movement, as my colleagues and I have defined. It takes the meditative-movement approach, the focus on attention/awareness, relaxation, and enhanced oxygenation, a substantial step further. It creates a measurable approach that defines a category of exercise, one that integrates as an independent component of exercise along with aerobic practices and strength training.

As noted in my own books, the roots of tai chi and qigong have origins that go far beyond Western views of science and healing. Yet these practices result in benefits that can be quite profound, are radically practical, economically potent, and, as Dr. Gryffin has demonstrated, influence well-understood physiological features. Having a measurable, physiological, and scientifically-based understanding of these exercise methods lays a foundation that can make these wonderful arts more widely accessible through programming and policy. The Metarobic approach promises to neutralize skepticism, which can occur among mainstream exercise physiologists and medical providers, regarding the efficacy and mechanisms of benefit underlying these exercises. Rigorous research has shown significant benefits. *Mindful Exercise* explains why, in a measurable and evidence-based approach. Thus, Metarobic practices will surely become “the prescription” of choice for all responsible medical providers!

Mindful Exercise is a comprehensive yet accessible resource for traditional tai chi and qigong practitioners and teachers, as well as for the contemporary wellness professional. This book is also a powerful introduction to those who are new to these arts, and possibly skeptical of their benefits. This book can be a bridge to bring mindful exercises such as tai chi and qigong into our hospitals, schools, older adult communities, recreation centers, and the military and VA on an even larger

scale. As such, this is a much-needed and invaluable book in Western society.

It makes a timely and significant contribution to a rapidly expanding body of literature, which can transform the face of medicine and health-care by allowing people to safely and conveniently take charge of their health. It is time to compare inexpensive nonpharmacological strategies to the ultraexpensive reliance on pills and medicine. Why would a somewhat sophisticated society like ours neglect such a beneficial approach to disease prevention? Metarobics practices have the potential to free individuals and society from explosively increasing and inappropriate medical costs.

Finally, in addition to the Metarobic approach to mindful exercise, Dr. Gryffin also concludes with a very accessible and inspiring overview of the psychological benefits of mindful exercise for dealing with stress, depression, and addiction. Overall, the research presented in this book lays the groundwork for maximizing health and longevity in a way that respects time-honored traditions. This understanding will ultimately support the application of the Metarobics framework to a wide range of dynamic and quiescent meditative practices beyond tai chi and qigong, to include forms of breath-focused yoga and walking.

Mindful Exercise adds a powerful perspective to a growing body of literature on the many benefits of these exercises, which in time may see exercises such as tai chi and qigong becoming as popular as the many forms of aerobic exercise currently practiced in society. I am not just comfortable, but enthusiastic, about recommending it widely!

Roger Jahnke, OMD

Author of *The Healing Promise of Qi* and *The Healer Within*

Director, Institute of Integral Qigong and Tai Chi (IIQTC)

Santa Barbara, California

Foreword

AS FOUNDER/DIRECTOR OF THE WORLD'S largest tai chi and qigong health education event (World Tai Chi & Qigong Day), and connecting with teachers of these arts worldwide following release of four editions of my own best-selling tai chi book published in several languages, and as a nearly forty-year student of the evolution of tai chi and qigong in America and worldwide . . . I have seen three paradigm shifts that profoundly expanded the global use of these extraordinary mind-body arts: Ken Cohen's *The Way of Qigong: The Art and Science of Chinese Energy Healing*, Dr. Peter Wayne's *Harvard Medical School Guide to Tai Chi*, and now . . . Dr. Peter Anthony Gryffin's *Mindful Exercise*.

This book is a portal that will change the way tai chi and qigong are approached, so that modern medical science can join hands with these ancient mind-body sciences to become coevolutionary. Science can help tai chi and qigong evolve and become even more effective. The introduction of mind-body sciences like tai chi and qigong will save global society trillions in health costs. I have seen millions of dollars saved by our health system, just due to my own hospital classes. As this book points out, this is happening all across the globe, which mirrors my experience of organizing World Tai Chi & Qigong Day in over eighty nations and speaking to tai chi and qigong teachers worldwide. Today, according to the National Institutes of Health, over two million Americans do tai chi. This book can help open a portal that will in time see that increase to 20, 30, or even 60 percent of Americans using the highly effective tools of tai chi and qigong, perhaps even expanding them into public education as a hybrid physical education / health science class. This book, and books like it that will surely follow in its wake, could lay the groundwork for such a movement.

I teach tai chi meditation programs through one of the world's largest medical university hospitals, conducting ongoing classes for people dealing with Parkinson's disease, heart disease, multiple sclerosis, chronic pain, balance, dementia, type 2 diabetes, mobility problems and more, and have seen patients experiencing the benefits this book's research cites. But now, thanks to Dr. Gryffin's brilliant book, I have a methodical, clear, and profoundly hopeful and exciting way to much more quickly help my students understand just how vast and multidimensional the benefits they can get are. As teachers, our struggle is to translate the internal experiences we have enjoyed from tai chi and qigong so that another person can understand them, envision them, and then practice them. *Mindful Exercise* does so clearly, methodically, and brilliantly, combining tai chi and qigong insights with modern science. This seminal work should be read not just by all those in my own hospital classes, but by every tai chi and qigong student, by every teacher of the arts, by every health professional and government health ministry or department employee, and by everyone seeking a more enjoyable and profound life and a more abundant, clear, and healthy society.

Bill Douglas

Founder of World Tai Chi & Qigong Day (celebrated in eighty nations)

2009 Inductee to the Internal Arts Hall of Fame in New York

Author of *The Complete Idiot's Guide to Tai Chi and Qigong* (4th edition)

Recipient of the Extraordinary Service in the Field of Qigong Award

from the National Qigong Association

Recipient of the Media Excellence Award from the World Congress

on Qigong

Preface

OVER THE PAST FIFTEEN YEARS of teaching tai chi, I have heard remarkable stories from students regarding benefits for health. Health concerns can be a driving force for starting tai chi. Indeed, many of those teaching tai chi today began practice as the result of a diagnosis with a life-threatening condition, in a desperate last-ditch effort to avoid death. And it worked, with sometimes miraculous and dramatic effects. Several of the case stories in this book are from those teachers, and their stories are powerful and moving.

As a mindful exercise, tai chi is becoming more popular, with many benefits for the health of the mind. Benefits for stress reduction, anxiety, depression, and addiction are presented in the conclusion of this book, and in more detail in an upcoming book. However, what is particularly remarkable about mindful exercise in general, and tai chi in particular, are the many incredible benefits for the health of the body, as well as for the mind.

Tai chi has been studied by researchers for almost every health condition out there—from heart, lung, and kidney disease, to cancer, stroke, diabetes, asthma, Alzheimer's, multiple sclerosis, chronic pain, immune system diseases, and more. Much of that research is presented in this book, along with over fifty case stories from those who have directly experienced the benefits of tai chi. But what was missing in the research was *why* these exercises were having such benefits. Chapter 2, “Qi: Science or Magic?” details views from a traditional Chinese medicine and cultural perspective. However, little has been done to understand how and why exercises such as tai chi were having benefits from a physiological perspective.

Following changes in the condition of three of my students with cancer, including one who had been given only three weeks to live, I

realized that there must be a physiological and measurable response that would explain these results. My research revealed a link between hypoxia (reduction of oxygen reaching various tissues or areas of the body) and enhanced blood oxygen saturation, diffusion, and metabolic function—a mechanism of health distinctly different from that of aerobic and anaerobic exercise.

I then realized that this meant that a third and new school of fitness needed to be developed, one that could explain why and how exercises that are neither aerobic nor strength-based were having such specific health benefits. Indeed, it has been noted in an extensive review of tai chi studies¹ that tai chi has no aerobic-specific effects. Yet tai chi has been found to have benefits for a wide range of chronic conditions. So if tai chi and related exercises are not aerobic exercises, then what are they? Since measurements suggest an effect on oxygen-based metabolism, I coined the word “Metarobics.”

Metarobic exercise is a good fit with aerobic and anaerobic categories of exercise. As detailed in chapter 1, aerobic exercise results in either no change or a drop in blood oxygen saturation and diffusion, depending on intensity. Measurements during tai chi and related exercises show a significant effect on enhanced blood oxygen saturation, diffusion, and oxygen-based metabolism. As a new theory, Metarobics explains how and why exercises such as tai chi can benefit such a wide range of chronic conditions. It turns out that relaxing the body in conjunction with slow abdominal breathing is not just good for your health, but fantastic!

Mindful Exercise is a unique book from many perspectives. Aside from documenting and presenting theories and research for a new category of exercise, I have included excerpts of life-changing testimonials and stories. These stories are dramatic, and many more are posted on the Metarobics Facebook page. Some are accounts that were personally related to me; others are paraphrased from various books and websites (listed in the references). However, as inspirational as many of these stories can be, always consult with your doctor regarding any changes to your health care.

Chapters 1 and 2 present research supporting my observations that exercises such as tai chi enhance blood oxygen saturation, diffusion, and oxygen-based metabolism as an effect unique from other forms of exercise. Chapter 3 covers research specific to cancer, which is what prompted many of my original observations. Chapters 4, 5, and 6 document research and theoretical effects for a wide range of other conditions, including heart and lung disease, stroke, kidney disease, asthma, diabetes, diseases of the immune system, and chronic pain.

Although the stories and research presented in this book affirm the live-giving benefits people have derived from forms of tai chi and related exercises, it should be noted that there are many styles and methods of teaching. Before choosing a school or a teacher, you are encouraged to read chapter 7, “Essential Elements of Metarobics and Tai Chi for Therapy.” It is also important to discuss any changes in health routines with your doctor.

The conclusion summarizes the current state of Metarobics as a new field of exercise. The conclusion also presents psychological benefits of tai chi as a form of moving meditation and mindfulness-based practice. Mindfulness-based practices are becoming increasingly used to address various forms of addiction, as well as for dealing with trauma. Implications are also discussed for exercises that do not necessarily fit into the typical aerobic or anaerobic categories, such as walking and yoga. Over time, Metarobics may come to include a wide variety of exercises.

Many people already practice some form of these exercises in various parts of the world, including the United States. It is my hope that this book will help an even greater number of people understand and benefit from these exercises. People ran, swam, and bicycled before Dr. Ken Cooper came out with his book *Aerobics*² in 1968, but it took his work to document the unique physiological effects of these exercises, leading to the diversity and growth of aerobic exercises that we have today. Metarobics does the same thing for tai chi and forms of qigong, and may come to embrace a wide variety of exercises that

do not quite fit conventional categories. Enjoy the book, and with a greater understanding of Metarobics, I encourage you to research your local opportunities and check out the resources available at Metarobics.org.

Dr. Pete Anthony Gryffin

Note: Blood oxygen saturation for the studies described in this book was measured with medical quality pulse oximeters. Lower quality oximeters may not give reliable readings, particularly during the brief drop in blood oxygen saturation following tai chi and other Metarobic practice.

Metarobics and Tai Chi: A New Paradigm of Fitness

How a Student with Cancer Changed
My Understanding of Exercise

MY AWARENESS OF HOW the body responds to certain kinds of movement occurred over a period of several years, and quite by accident. It was a gradual process, which is detailed in the following chapters. It began with the first student who came to me convinced that tai chi had cured her cancer. Over time, I came to realize that a large variety of chronic diseases shared a common element—an element directly affected by tai chi and similar exercises, which have unique and measurable effects on blood oxygen saturation and diffusion. It is worth noting that hypoxia (reduction of oxygen reaching various tissues or areas of the body) underlies the majority of chronic diseases plaguing society, including cancer, heart, lung, and kidney disease, stroke, and diabetes. Hypoxia is also implicated in asthma, chronic pain, and immune disorders.

My research and experiences consistently supported that many of the health benefits of tai chi and forms of qigong (breathing exercises) had to be the result of a physiological response related to enhanced blood oxygen saturation and diffusion, a mechanism that was distinctly different from aerobic and anaerobic forms exercise in that it had direct and beneficial effects on hypoxia. By default, this meant

At Death's Door

"The doctors had tried everything—chemotherapy, radiation, nothing seemed to work. All that happened was that my hair fell out, and I was in constant pain. I was taking five of the maximum doses of pain pills daily, but with little effect. Then a friend told me they read about a guy with brain cancer being cured by an exercise called tai chi. By the time I learned about tai chi, my doctor told me I had about three weeks left to live. Not ready to give up, I looked for a class and found one at the community college. The teacher made me a video that night, which would talk me through the form. A little over a week later, I was completely off of pain pills. If nothing else, that was worth it. And although I am still battling cancer, three weeks has come and gone, and two years later I am still alive."

—Kathy (Personal account)

that a third "new" category of exercise must exist. My research and observations pointed to a dynamic state of relaxation and enhanced respiration as underlying the primary mechanism of action. This "third school of fitness," which I call Metarobics, for reasons described below, is being developed out of the slow movements of tai chi, as well as forms of yoga and qigong when focused on relaxation and the breath.

Everyone knows that exercise is good for one's health. It can enhance strength, cardiovascular health, and even mental health. Yet even highly fit people still get sick, experience degenerative diseases of the bones, joints, and organs, and are subject to cancer and many other ills, albeit less frequently than their sedentary counterparts. Based on a growing body of research and testimonies from those who have benefited from tai chi, Metarobic exercises may add another component. Metarobic exercises enhance fitness at the cellular level, which, in conjunction with a healthy diet and other forms of exercise, could supply the missing element in total health and immunity to make a person as free from illness, degenerative disease, and cancer as possible.

These exercises have profound health effects for many conditions, yet they are not fast-paced enough to be considered truly aerobic. Indeed, some qigong movements and standing yoga poses are stationary, with a focus on slow, relaxed breathing. Nor do these practices work the large muscle groups the way strength training does. Tai chi is sometimes categorized as a “low to moderate” aerobic exercise, particularly if you “up” the intensity. However, focusing on speeding up the movements of tai chi in an attempt to make it a form of aerobic exercise may negate some of the benefits unique to totally relaxing the body through slow movement.

From an intuitive perspective, because such a wide range of health benefits are being attributed to these forms of exercise, it seems likely that something unique is going on in the body. My research supports this and sheds light on what will become a whole new field of exercise. Fifty or so years ago running was almost the sole domain of track and field, and the concept of running for your health was considered unusual. I can recall stories of people running along city streets who would be asked jokingly, “What are you running from?” The rapid

A Miracle, or Tai Chi?

“After I retired, I ended up getting rheumatoid arthritis which developed rapidly. The doctor said before long I would be unable to walk, and would need a wheelchair. By the time I heard about tai chi, I could barely stand on my own. I began practicing every day, doing tai chi in my wheel chair, and soon I could do it standing. The doctor was surprised at how much progress I made in less than six months after starting tai chi. He was dubious about tai chi, but said to keep with it. I am glad I did, because before two years had passed, I was pain free and able to walk on my own. I completely recovered my former health and mobility, maybe even more so. Seeing the changes in my body, the rheumatologist was calling it a miracle. Maybe it was—the miracle of tai chi.”

—Elisa Morella (From *Tai Chi for Health Institute Newsletter*)

gyrations of modern aerobic programs could have gotten one committed to an asylum. It wasn't until 1968, with the release of the groundbreaking book *Aerobics*¹ by Dr. Kenneth Cooper, that the concept of aerobic health was popularized, along with a new word for a new form of exercise.

Dr. Cooper noted that those with large developed muscles from body building exhibited poor performance in running, swimming, and cycling. Based on these observations of differences between runners and weightlifters, he coined the term *aerobics* and founded a new field of health. Now there are few who are not aware of how important it is to perform some form of aerobic exercise at least a few days every week. It would be easy to assume that our current understanding of aerobics is fairly well established—it is now a multibillion-dollar industry and is a well-established field of study within the health and kinesiology departments of many universities. It is easy to assume that we now know everything there is to know about the body and how it works, so much so that it is equally easy to make the assumption that movement is movement is movement.

But as far as alternative forms of exercise go, there are still new frontiers and ways of moving for health and fitness. Current research on alternative forms of health and fitness such as tai chi and forms of qigong is primarily oriented around the benefits of these exercises, and there is little research into how or why these exercises provide benefits. In research studies on the health benefits of tai chi and qigong, often no reason is given for the benefits for various conditions. Alternatively, benefits may be attributed to a vague concept of “qi” as “vital energy,” or as a mystical force. This is further discussed in chapter 2, “Qi: Science or Magic?” As long as these exercises result in measurable benefits, it may seem to matter little why or how their benefits are derived. But a greater understanding of the physiological mechanisms involved will help to better research, promote, and understand a growing field of health and fitness.

In a collaborative overview of the unique differences between tai chi and similar exercises, Drs. Linda Larkey, Roger Jahnke, Jennifer

Qi: Science or Magic?

Experiences with Language and the Mysteries of Qi

TAI CHI AND SIMILAR EXERCISES are yielding phenomenal results for a large variety of health concerns. When I began collecting case stories for this book, I was amazed at the number of people who have benefited from these exercises, often in dramatic ways. That tai chi and various qigong exercises increase blood oxygen saturation indicates that it is no coincidence that the Chinese word “qi” (pronounced “chi”) is so strongly associated with these exercises. Despite qi’s common association with the metaphysical and energy work, at its most basic level qi is best understood from its literal translation as “air.”

Pacemaker-Free through Tai Chi

“I had to have a pacemaker due to bradycardia. I was told that I would need a pacemaker the rest of my life. I became depressed, gave up running, and began using antidepressants. A year later I decided to try tai chi. Initially I could barely finish a class, but within two months I noticed improvements. I returned to my cardiologist, and was told that my heart was now regulating normally, and that I no longer needed the pacemaker. I am now off of all medications for depression and hypertension as well. I am also now running again.”

—Ted (Personal account)

In most Chinese-English dictionaries (such as the *Oxford Chinese Dictionary*¹) the Chinese word “qi” is directly translated as “air.” Some Chinese-English dictionaries take into account cultural aspects of the language. One dictionary even states that the concept of qi is unique to Chinese culture and cannot be translated.² This brings us back to the question of qi, which is the basic attribution behind the benefits of exercises such as tai chi and qigong. In traditional Chinese medicine, and in much of the tai chi community, the word “qi” is typically translated as “vital energy.”³ Vital energy is a rather vague term but does, however, reflect the role of oxygen-based metabolism in all of the functions of the body, including thinking, digesting, and movement, and even in healing and physical repair of the body. Tai chi is considered a form of qigong due to its slow movements and the deep-breathing component. Qigong, with “air” as the root of qi, and “gong” as “cultivation” or “work,” can be translated as “breath cultivation,” “breath work,” or even “breathing exercise.” As such, qigong can include a wide variety of exercises.

The realization of the literal translation of “qi” was one of the occurrences that prompted my understanding that efficient oxygen use was important for the health of the body. Despite its literal translation, over the years the word “qi” has come to be used for everything from “vital energy,” as mentioned above, to being described as a “mystical force which permeates the universe.”⁴ Qi is frequently relegated to the same mystical realm as the “force” of *Star Wars* fame. It wasn’t until my experience teaching English at a Chinese school that I realized that the basic Chinese view of qi is entirely different from common perceptions, one that has profound implications for a new field of health and fitness.

While teaching English at the Chinese school, I used the word “qi” as an example for something relating to the spirit. The class met my comments with confused looks, so I asked what confused them. It turned out to be the word “qi,” which to the class simply meant “air” or “oxygen.” It would be like mistaking oxygen for the word “spirit,” and saying to a group of young Catholics, “In the name of the Father, the Son, and the Holy Oxygen.”

Metarobics and Cancer

The Battle against Hypoxia (Oxygen Deficiency) and the Experiences of Three Students with Cancer

IT WAS THE EFFECTS of Metarobic exercises on three of my students with cancer that really prompted my curiosity as to how these exercises might be having such dramatic effects on the body. This was the final clue that oxygen use in the body was considerably more critical and comprehensive than just generating chemical energy for the large muscle groups. The first student came to me on the last day of the semester, stating simply that tai chi had cured a cancerous lump in her wrist. I am not convinced that the lump in her wrist was cancerous, since cancer is uncommon in this area, but her comments caught me by surprise. After making sure she was seeing her doctor regularly, I thought no more of it.

Two years later another student told me a similar story. He did not want to go into detail, but he said the cancer he had did not respond to chemotherapy until he started tai chi. His cancer disappeared shortly thereafter. Then a year later, during the summer session, a third student, Kathy, who was in the last stages of cancer, came to my class. White as a sheet and wearing a bandana to cover her loss of hair, she told me that she had been through all forms of chemo and radiation therapy, but to no avail. Her doctors told her she had about three weeks left to live.

As mentioned in her story in chapter 1, Kathy was not ready to give up, and decided to try alternative therapies. She had read that tai

Tai Chi and Qigong Helped Me Battle Lymphoma

"Helen Liang had a rare and aggressive form of lymphoma. Chemotherapy failed to eliminate the cancer, and her doctor felt she had only about two weeks left to live. Her father, a famous kung fu master (Liang Shou-yu) began Helen on an intensive practice of qigong, tai chi, meditation, and alternative forms of Chinese and Western medicine. Helen states: 'I was more relaxed, and I was doing qigong and tai chi with my dad every day. We'd go out and do all kinds of qigong because it's good for you to stay outside and get a lot of oxygen. That's supposed to kill cancer cells.' With all the practices she engaged in, it would be hard to single out tai chi and qigong, but for a long time it was a focus of her practice, and is still a regular part of her life seventeen years later."

—Martha Burr (From *Kung Fu Tai Chi Magazine*)

chi can help with cancer, so she came to me. That night I made her a video that talked her through the form. The next day I gave it to her, going over the form with her. Three weeks later, not only was she still alive, but she was completely off the pain pills she had been taking. Up to this point, she had been taking five maximum doses of morphine a day. Two years later she was still taking the tai chi class before moving to the Northwest to fulfill a lifelong dream.

At this point I knew there really was a possibility that tai chi could have a direct effect on cancer and other conditions. With the first two students, it could have been the radiation and chemotherapy that had made the difference. But the extreme state of this student indicated that tai chi, as well as the qigong exercise Ba Duan Jin (also known as the eight pieces of silk brocade exercise), which was also included on the video and in class, was a major influencing factor.

Following the improvement in Kathy's condition, I began researching cancer, and found that there is an extensive body of research related to hypoxia (oxygen deficiency) and cancer. Research into the literature on cancer treatment, described below, indicated that effects

Metarobics: Heart Disease, Stroke, and Kidney Disease

Dealing with the Pressures of Life

CARDIOVASCULAR DISEASE, also known as heart disease, is strongly linked to diet and inactivity, and is the number one cause of death in the United States. Plaque buildup in the arteries that supply blood to the heart is called coronary artery disease. Plaque buildup is generally the result of a diet high in saturated fats. The plaque literally clogs the arteries so that blood cannot get to the heart in sufficient quantity, much like a clog of hair creates a slow-moving drain. Atherosclerosis, or hardening of the arteries, is also caused by a buildup of plaque.

Restricted blood flow to the organs can result in hardening of the arteries due to increased pressure on the arteries. Heart attacks can result from heart disease when blood clots and is prevented from reaching the heart. According to an American Hospital Association report, currently one in three American adults have some form of cardiovascular disease.¹ The Centers for Disease Control and Prevention (CDC) states that heart disease accounts for almost 700,000 deaths each year in the United States.² Heart disease is also almost entirely preventable.

The key element in relation to Metarobic theory is restricted blood flow to various areas of the body, in this case the heart or brain, which can also increase blood pressure. Metarobic exercises such as tai chi relax muscle tension in the body and have a direct effect on

Tai Chi Prevented a Heart Attack

"Maggie told me that she had been a longtime tai chi practitioner but did not do other exercises. She went in for a stress test, and the doctors were surprised to find that her arteries were over 90 percent blocked. Maggie was rushed in for a bypass, but following the operation her heart would not resume a regular heartbeat. She was told that she would need a pacemaker. The doctors were about to send her back into the operating room. But for some reason, Maggie felt that if she could just do tai chi, her heart would be okay. She asked to be left alone for an hour and did tai chi. When the doctors came back, her heart had stabilized. The doctors were surprised, and told her, 'Whatever you are doing, keep doing it.' Maggie stated, 'The moral of the story is that even with tai chi, a good diet and cardio exercise are still necessary, but tai chi did keep me going until I got the bypass, and got my heart back to beating normally. So now I do both (cardio and tai chi).'"

—Personal story related at a tai chi workshop

blood pressure, documented in numerous studies (highlighted below). It is also possible that enhanced metabolic function via tai chi may even affect cholesterol metabolism. More efficient cholesterol metabolism may help moderate the balance of HDL cholesterol, which carries away deposits from the arteries, and LDL cholesterol, which leaves deposits and can lead to a heart attack or stroke. Hypoxia can underlie problems with managing cholesterol. According to a study conducted at Johns Hopkins University, intermittent hypoxia is associated with hypercholesterolemia (extreme levels of cholesterol in the blood) as a result of obstructive sleep apnea, which can occur as a result of intermittent or partial blockage of the airways during sleep.³

Beneficial effects of tai chi on blood pressure are related to the slow pace of the exercise and its focus on relaxation. Blood pressure is the force or pressure of blood inside the arteries. If you did not have any blood pressure, the pumping of the heart would have little effect

Metarobics, Lung Disease, and Asthma

Better Breathing through Tai Chi and Qigong

METAROBIC EXERCISES such as tai chi and various forms of qigong, having been developed to maximize efficient use of oxygen and respiration, can have positive effects on the many conditions associated with forms of chronic respiratory diseases. Chronic lower respiratory disease is the third leading cause of death in the United States. It can result from a variety of factors and is an umbrella term for a variety of conditions. Essentially, chronic respiratory disease can be seen as an ongoing difficulty with breathing. The two primary forms of chronic respiratory disease are asthma and chronic obstructive pulmonary disease (COPD).^{1,2}

The Centers for Disease Control and Prevention (CDC) states that approximately 25 million people in the United States have asthma, or about one out of every twelve people, and that this number is growing every year.² Another 13.1 million Americans have been diagnosed with COPD, with 24 million more adults living with impaired lung function, which is an indication and precursor of COPD.¹

COPD is an umbrella term for two lung diseases, emphysema and chronic bronchitis, characterized by obstruction to airflow that interferes with normal breathing.¹ This chapter also looks at the promising elements of Metarobic exercises for asthma, since asthma shares some elements in common with COPD, as a chronic long-term respiratory

Tai Chi Helped My Asthma, and Cured My Back Pain Too!

"I developed asthma more than twenty years ago. For the last fifteen years, I have had to use an inhaler several times a day. After starting tai chi, my posture improved and in seven to eight months there was dramatic improvement. I no longer feared not having my inhaler with me, and over time stopped carrying it. As I write this, I realize that except for one setback, I have not had an episode in two to three months. And my back pain has disappeared too."

—Kenneth G. (Posted on ChiArts website)

disease that inflames and narrows the airways and interferes with breathing.

Cigarette smoking is the primary risk factor in the development of COPD. It is worth noting that 85–90 percent of COPD deaths are caused by smoking.¹ COPD and other conditions such as asthma are a result of damaged or inflamed airways restricting air intake. Emphysema and chronic bronchitis tend to coexist, having a further negative impact on quality of life, the end result of which can be living with oxygen bottles and mechanical respiratory assistance.¹ A growing number of studies, reviewed below, support the benefits of tai chi for alleviating symptoms of chronic respiratory disease and indicate that its practice may help compensate for damaged airways.

Tai chi and forms of qigong may also benefit upper respiratory conditions. If my sinuses are congested when I begin my own practice, by the end of tai chi or the eight treasures breathing exercise they open up completely and any congestion disappears. This may be due to enhanced blood flow through the sinus passages, which can reduce swollen sinuses. Auxiliary qigong exercises that involve pounding the chest can also bring up congestive matter from the lungs, which allows the body to expel it more easily.

Note: Despite the affirmation of how tai chi helped Kenneth G.'s asthma, it is not recommended to discontinue carrying an inhaler unless approved by your doctor.

Metarobics for Immunity, Diabetes, and Pain

Enhancing Quality of Life

AS NOTED EARLIER, the Metarobic response resulting from exercises such as tai chi and various forms of qigong has been shown to have a direct effect on the immune system beyond what is experienced with conventional exercise. Influenza (the flu) is the eighth leading cause of death in the United States. Influenza results in deaths primarily among older adults due to a compromised immune system. According to the Centers for Disease Control and Prevention (CDC), 90 percent of deaths from influenza occur in those sixty-five years of age or older.¹

As people age, the thymus, located in front of the heart, shrinks and can become nonfunctional in their sixties or seventies. The thymus is a gland that, aside from producing various hormones, also plays a vital role in the development of T lymphocytes (or T cells). T cells are a type of white blood cell that protects the body from bacteria and viruses.

Hypoxia has been identified as one possible cause for age-related decline in the immune system.² Researchers believe that the immune system can be manipulated with drugs to influence oxygen and hypoxia, to assist those with poor immune systems, or possibly in some circumstances help with autoimmune diseases and conditions. Since tai chi enhances blood oxygen saturation and diffusion, Metarobic exercises may have a similar effect without the need to resort to medications,

Tai Chi—Less Sickness and Better Sleep

Paul, a student at Fullerton College, was very dedicated to the practice of tai chi. Realizing the benefits of tai chi and the Eight Treasures, he religiously performed these exercises daily. Ten years after he began practicing them, he stated that since he began practicing tai chi, he has never been sick, even when in continual contact with those who had whatever cold or flu was going around. He did mention that on days when he had been overly busy and missed doing the exercises for a few days when around friends or family who were sick, he would feel the beginnings of a cold coming on. This would prompt Paul back to daily practice—and the cold would disappear. This happened often enough that he realized that there did indeed seem to be something behind the rumored benefits of tai chi and qigong for enhanced immunity. Paul finally came to the point that even when he retired at a late hour (even 2:00 or 3:00 at night), he would do at least some tai chi or qigong. Even when exhausted, he could feel energy returning. He also found that tai chi helped him fall asleep faster. Paul stated that it was almost as if his mind began entering a sleep-like state during his tai chi practice.

—Paul (Personal account)

which can have dangerous side effects. It is important, however, to keep in mind that you should never change your medications without consulting with your doctor.

Studies on the effects of tai chi practice on immunity provide support for this. A study done by researchers at the University of Illinois noted that high-intensity exercises such as high-impact aerobics can result in short-term immune suppression despite long-term benefits for cardiovascular health.³ The study showed that in comparison, tai chi practice enhanced immunity with short- and long-term beneficial effects.

Dr. Jennifer Robbins, with the Department of Internal Medicine at the University of Cincinnati, cites numerous studies that demon-

Essential Elements of Metarobics and Tai Chi for Therapy

Teaching, Learning, and Researching
Tai Chi and Qigong for Health

TAI CHI IS FAST BECOMING a popular exercise, resulting in a wide range of teaching methods. Some changes are beneficial, but others may reduce or even eliminate the unique benefits of tai chi. This chapter provides a brief overview of the development of tai chi for health and discusses what to look for when choosing a class to maximize the benefits of tai chi from a Metarobic and structural perspective. The chapter closes with recommendations for effective research on tai chi and related exercises.

Tai Chi for Health

“Dr. Paul Lam is one of the pioneers who has worked hard to make tai chi user friendly for health. Dr. Lam started tai chi over thirty years ago after graduating from medical school. As a teen he suffered from osteoarthritis, and by the time he graduated medical school his condition was so debilitating that he could not even carry a briefcase. Since then tai chi has changed his life. His arthritis became well controlled, and he attributes his good health and positive attitude to his dedicated tai chi practice.”

—Tai Chi for Health Institute website

As with most of the research presented in this book, tai chi is the main focus of this chapter, since it is more common and more familiar to people in the United States than qigong. But both forms of these exercises share many commonalities, including slow, relaxed movements, gentle stretching of the limbs, and focus on deep breathing and good postural alignment. Since some forms of qigong, particularly those developed for martial purposes, do not necessarily follow this format, elements of other forms of qigong that can be detrimental to health will also be touched on.

There are many colorful histories and legends regarding the origins of tai chi,^{1,2} but the essence behind the slow, spiraling movements lies in its origin as a martial art. The slow movements permitted a level of mastery over muscle tension and body structure that allowed more efficient use of muscular power, as well as increased sensitivity in controlling the movements of a “stiffer” opponent. The person who was more relaxed could feel the tension in the other person, allowing anticipation of movements and an ability to redirect attacks. Once a tai chi master made contact with another person, he had total control over his opponent. Tai chi chuan literally translates as “grand ultimate fist,” describing its effectiveness in combat when practiced as a martial art.

Over time people came to realize that tai chi was a valuable health exercise as well, since deep breathing and removing tension from the body have many health benefits. Because this is also the goal of many qigong exercises, tai chi has become classified as a form of qigong, and has since been popularized primarily as a health exercise.

The Breath and Pace in Tai Chi

The breath is at the core of many of the health benefits of tai chi. Many people tend to breathe shallowly, expanding the ribs in what is called chest breathing, as opposed to diaphragmatic breathing, which involves expanding the stomach and activating the rib muscles and diaphragm. Most books on running or aerobic exercise are quick to point

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About the Author

Dr. Pete Anthony Gryffin has over thirty years of experience with tai chi, qigong, yoga, and kung fu. His interest in these arts spans the spectrum from the health of mind and body to traditional elements of tai chi and kung fu as martial arts. His research interests include implications related to hypoxia, cancer, and tai chi; the development of the theory of Metarobics; and application of mindfulness-based practices for dealing with stress, trauma, addiction, and destructive



behavior. He has been a tai chi instructor for the Shands Arts in Medicine program and for Fullerton College, where he developed the curriculum for eight new courses oriented around mind/body health and fitness using traditional martial training and wilderness experiences. Dr. Gryffin is a regular presenter at state and national conferences. His work includes over fifteen commercial and professional publications. He was an Alumni Fellow at the University of Florida, where he received his PhD in health and human performance.

