NUTRITIONAL HYDRATION™

Medical Strategy for Military & Athlete Warriors

Ten Point Plan for Superior Performance and Extended Life

Charles B. Simone, M.D.

Princeton Institute

DrSimone.com PrincetonInstitute.com
NutritionalHydration.com

Manufactured in the United States of America by
Princeton Institute, LLC. PO Box 7532 ▪ Princeton, NJ 08540

First Edition 2008 Book and DVD "Warrior Training"

Cover design: Charles B. Simone, M.MS., M.D.

Library of Congress Cataloging-in-Publication Data

Simone, M.MS., M.D., Charles B.
Nutritional Hydration™ Medical Strategy for Military and Athlete Warriors Ten Point Plan for Superior Performance and Extended Life plus DVD "Warrior Training" /Charles B. Simone, M.D.
Includes bibliographical references and index.

ISBN 0-9714574-4-1

1. Nutrition – Military and Athlete Warriors, Athletes
2. Antioxidants, Amino Acids – Therapeutic use
3. Exercise and Sports – Nutritional Aspects and Diet
4. Cancer – Risk factors. I. Title
5. DVD – "Warrior Training" – Nutritional Hydration, Kettlebells, and Rubber Band Stretching

TX361.A8 N88 2008 08-14177
613.2'024796 – dc21 CIP

Charles B. Simone, M.MS., M.D. at Simone Protective Cancer Institute, 123 Franklin Corner Road Lawrenceville, NJ 08648 ▪ 609-896-2646

Table of Contents

Introduction

Poor food choices and poor lifestyles lead to suboptimal physical and mental performance, a compromised immune system, and a higher risk for cancer and cardiovascular disease. And yet, some military and athlete warriors and some of the people who watch over them don't think about their future risk of disease. But 60 percent of women's cancers, 40 percent of men's cancers and 75 percent of cardiovascular diseases are related to nutritional factors alone. Only 7%-10% of diseases are related to genetics – so we have control.

A person's nutritional needs depend upon height, weight, age, gender, and the type, frequency, intensity and duration of activity. Some people train year round, while others train during specific times of the year. Where and how training occurs is important. Some want to gain weight, some want to lose weight, or, some like wrestlers and boxers, want to gain muscle mass but lose weight periodically to make their weight class for competition. Some people have eating disorders. Some eat snacks and fast foods, and some take supplements that have no scientific basis. Many are dehydrated.

Some warriors know very little about nutrition. The main sources of their nutritional information are magazines, military staff, coaches, and other athletes. Athletes say they rely on their coaches for nutritional information and sometimes even receive nutritional products with minimal scientific backing. Studies indicate that coaches, athletic trainers, and athletes need more effective nutritional information and be made aware of useless or even dangerous products.[1] Even the Institute of Medicine has gotten involved for the Department of Defense to develop the nutritional basis of the ration for sustained operations (SUSOPS).

You can improve your physical and mental performance and achieve greatness. One of the most important factors is Nutritional Hydration™, a phrase we coined to embody the essential basics of nutrition and hydration for the body and specifically for the muscle, nerve, and neuromuscular junction. This is a new medical strategy.

The chance of success in military operations, competitions, or emergency situations is greater if you are physically and mentally fit. Your Nutritional Hydration™ status before, during and after military missions or competitions dramatically influences your physiology and therefore influences the outcome – good or bad. The smart, well informed, well trained and properly nutritionally hydrated warrior is an awesome opponent and can beat a complacent leader. This warrior has the advantage and can become the leader. This book will help you dispel many myths and share with you "tip of the spear" scientific facts to achieve superior performance, decrease risk for disease, and extend life. **Nutritional Hydration™ Medical Strategy for Military and Athlete Warriors** will positively change the lives of men and women and dramatically change their futures.

1

Energy Source

Plants produce carbohydrates that consist of starch and sugar. Starch is found in grains and vegetables (rice, potatoes, corn, pasta, and breads). Natural sugars are found in fruits and juices. We digest and convert carbohydrates to glucose. Blood glucose can be used immediately for energy needs or stored as glycogen in the muscle and liver. Glycogen represents 3% of the body's total energy reservoir. Glycogen is muscle's major source of energy and is composed of many units of glucose – picture glycogen as a bunch of grapes and each grape is a unit of energy. If more glucose from food is consumed than can be used immediately or stored as glycogen, it is converted into fat and stored in fatty tissue (80% of the energy reservoir). Protein represents 17% of the body's energy reservoir. Excessive glucose above what is used for immediate energy, or glycogen storage, or fat deposition, is ultimately spilled into the urine, as in the case of the diabetic.

Glucose and glycogen are easy-to-use sources of energy for the body, but they are in limited supply. Protein also is easy to use but at a high price – muscles are devoured. Fatty tissue, the largest source of energy, is the most difficult and slowest to metabolize.

So when you first begin to exercise, glucose from glycogen is used because it's right there in the muscle. But as you continue to exercise, more oxygen enters the blood shifting the source of usable energy from precious stored glycogen to glucose and free fatty acids that are in the bloodstream. The more training and conditioning

2

Muscle, Protein and Amino Acids

MUSCLE

Muscles account for 50 percent of the body mass in men and 40 percent in women.[1] Compared to any other organ, therefore, muscles consume the most calories, even at rest. But as you enter your thirties, the muscle mass begins to decrease in size and strength every year and subsequently less calories are burned. Although exercise slows this process, it does not prevent it. Moreover, you can train very hard for two months, do nothing for three months, and the result will be as if you had never trained at all.

Muscles always get damaged during exercise and must be repaired. The repair process needs to function properly and requires certain nutrients and satellite cells (muscle stem cells) inside the muscle cell. However, the repair process itself declines as you get older causing the muscle to work less efficiently.

Slow and Fast Twitch Muscles

Muscles are made of slow and fast twitch fibers. Slow twitch fibers are ideal for endurance activities because they contract slowly but repeatedly for extended periods of time by slowly producing large amounts of energy. They use oxygen more efficiently with minimal lactic acid accumulation. Fast twitch fibers are ideal for speed because they contract quickly but fatigue quickly since lots of energy is consumed without replacing it fast enough. **You can actually train fast fibers to become slow fiber muscles. And you can train fast fibers to**

3

Nutrients for Superior Performance

Fatigue and Cramping

Fatigue and muscle **Cramping** are an athlete's worse nightmare. Nothing is more frustrating to a highly conditioned person than being unable to continue a mission or competition because of cramping and fatigue.

Now There is a Solution

Fatigue, Cramping, Physical Exhaustion and **Dehydration** result from exercise that causes the depletion of vitamins, minerals, amino acids, electrolytes, sugars, and water – these need to be replaced.

When I decided to develop a comprehensive nutritional hydration formula that would also address the issue of fatigue and cramping, I summoned my personal experiences from visiting extremely hot climates like the Grand Canyon, deserts, and tropical jungles and also from treating cancer patients – 75% have fatigue, and 40% die from malnutrition and dehydration. Researching and understanding the physiological needs of the muscle, the nerve, and neuromuscular junction is important.

Fallacy of Some Drinks

Some activity drinks have high amounts of sodium reflecting the widely held fallacy that strenuous activity calls for salt. This is wrong and potentially dangerous. In fact, the Military has shown that water alone can prevent heat casualties and sodium supplementation is not necessary at all if you are eating a diet that normally has plenty of sodium thus sufficient for virtually all sodium losses.[1]

NUTRIENT GROUPS WORKING IN SYNERGY

PROPER ELECTROLYTES

Potassium

- The Military Committee recommends that people take **potassium supplements** because you cannot obtain enough potassium from foods alone.[3]
- Low potassium intake leads to hypertension and stroke.[4]
- **Low potassium levels in muscles occur following excessive consumption of cola** because cola has high amounts of glucose and caffeine causing diuresis with accompanying urinary potassium loss.[5]

Sodium

- Too much sodium causes stomach cramping and more thirst because it increases the osmolality and therefore has to be diluted by the body before it can be utilized.
- When a large amount of sodium is added to a drink, instead of getting fluid replacement, the body has to send its own fluid to the stomach in order to dilute that large sodium load. Some activity drinks have a large amount of sodium as the main, and sometimes, only electrolyte.
- The more sodium you consume, the greater is your need for more water intake.[6]
- High sodium intake decreases sweating by increasing the plasma osmolality.[7] Sweating gets rid of heat.
- High sodium intake leads to hypertension and stroke.[4,8]
- The Military[9] has shown that water alone can be used as a tactical weapon to prevent heat casualties. Sodium supplementation is not necessary at all if you are eating a diet that normally has plenty of sodium (American diet has 6-18 gm of sodium per day).
- Sodium loss of 11 to 16 grams can occur if you sweat about 12 liters in a day doing moderate work. But this loss is covered by your diet. In fact, no sodium supplementation is necessary after 6 hours of moderate exercise even in a hot environment.[10]

YOUR IDEAL SUPPLEMENT PROGRAM

Almost 40 percent of people take supplements, but the ones they take are not necessarily the ones they need. **A proper formulation should consist of four factors**: the **correct nutrient**, the **correct dose**, the **correct chemical form** of that nutrient, and the **correct ratio of one nutrient to another**. Often, a person will hear or read about a specific nutrient and run to the store to buy that nutrient without knowing the correct dose, correct chemical form, and correct ratio of it to another.

I recommend taking the following combinations of antioxidants, vitamins, minerals, amino acids, fibers, and other nutrients as supplementation shown below.

4

Nutritional Hydration™ Medical Strategy

Almost 50 percent of people who go to a gym are dehydrated before beginning a workout. And many athletes are chronically dehydrated, especially while training in hot climates and/or purposefully reducing body water to make weight, as in wrestling, boxing, etc. Dehydration impairs appetite, the thirst response, and interferes with proper body temperature regulation. This is most pronounced in hot or cold environments as well as at high altitude.[1,2]

Military and athlete warriors, people in deserts, or people doing strenuous physical activity can lose 1 to 2 liters of sweat per hour – that's 8 to 17 ounces every 15 minutes. And they can lose up to 4 liters per hour if they wear heavy clothing on a hot day.

Hydration improves mental and physical performance, and yet many still do not drink enough before, during, and after exercise, competition or mission. **If you are dehydrated by as little as 2%, as measured in loss of your body weight, your performance is decreased to about 85%; with 5% dehydration, performance is down to 70%.**[3]

Signs and Symptoms of Dehydration

- Dizziness while sitting or standing
- Confusion, Mental State Change, Irritability
- Weakness and Decreased Performance
- Cramping, Nausea and/or Vomiting
- Headache

Studies clearly show that proper nutrition and hydration allow for better mental and physical performance – you run harder, faster, farther, have better acceleration and agility, more endurance, less injuries, less mental fatigue, and better recovery. You even win and score more often.[4-6]

5

Nutritional Hydration™ for Hot, Cold, and High Altitude Environments

The Committee on Military Nutrition Research has thoroughly reviewed the nutritional requirements for those working in hot, cold, or high-altitude environments.[1,2]

Poor nutrition and hydration impairs your response to the heat, cold and low levels of oxygen. Hydration is critical. Next is the proper level of energy intake, particularly carbohydrate. Low intake of carbohydrate forces the body to use fats for an energy source that increases ketoacidosis, making the body very acidic. An acidic body impairs muscle strength and coordination, endurance, and the proper regulation of body temperature. Don't eat fatty food, including bars, in a challenging environment.

HOT ENVIRONMENT

In a hot environment, only 20% of your energy is used for muscle work, the rest is given off as heat. For every increase of 10°F (5.6°C) your hydration requirement increases by 50% at rest, and the hydration need is even higher when you do work. Soldiers on missions carrying 50 pounds at 100°F (37.8°C) require about 12 liters of fluid. The only way to get 12 liters into a person is by drinking a certain amount at specified time points – water discipline, as the military refers to it. [3] And for every 1°F increase between 86°F and 104°F, your energy requirement is increased by 0.5%.[4]

6

Exercise, Nutrition and Immunity

Regular, moderate exercise enhances the immune system. However, exhaustive exercise or overtraining suppresses the immune system.

Nutrition affects immunity and also affects the development of cancer either directly or indirectly via the immune system. The immune system is a complex interaction of blood cells, proteins, and processes that protect you from infections, foreign substances, and cancer cells.

White blood cells and antibodies are two major armies of the immune system. Lymphocytes are types of white blood cells and they are divided into two groups, T cells and B cells. T lymphocytes, or T cells, are derived from or are under the influence of the *thymus*, an organ in the neck and front part of the chest that is functionally active in early childhood. T cells fight cancer, fungi, certain bacteria (intracellular), and viruses. B cell lymphocytes originate in the *bone* marrow and produce proteins called antibodies. Phagocytes are another group of white cells that dispose of abnormal cancer cells and other foreign substances.

NUTRITION AND THE IMMUNE SYSTEM

Nutritional deficiencies inhibit the immune system and decrease a person's capacity to resist infection and cancer. Poor nutrition adversely affects all components of the immune system, including T cell function, the ability of B cells to make antibodies, the functioning of the complement proteins, and phagocyte function.

7

Nutritional Hydration™ Before, During, and After…

Tournaments have become common for many sports. Soccer tournaments can have 3 to 6 games over a 2 to 5 day period with the same players involved, young children to teenagers. The games can start as early as 7 AM and finish as late as 10 PM. Some players may have to play two or three games in a single day. And much of the day is spent out-of-doors, in the heat, cold, sun or rain. Nutritional Hydration™ is important.

BEFORE… If you plan to exercise, compete, or are on a mission upon waking, you need to quickly replace the glycogen, nutrients, and fluids that were used while you slept. You may require 16.9 ounces (half liter) to 34 ounces (1 liter) of fluid before beginning.

Avoid protein or fatty foods on the day of a game because those foods take too long to digest and divert needed blood from muscles to the gastrointestinal tract for digestion. **Also avoid foods with a high glycemic index (free glucose) like fruits, honey, corn flakes, cookies, cakes, candies, sweet rolls, gels, etc**. These foods can gyrate your insulin leading to hypoglycemia during a competition. **Avoid high fiber foods** just before because they may cause gastrointestinal distress, gas, or worse, the urge to defecate at an undesirable time.

Complex carbohydrates in liquid form are easier to assimilate and digest than solid foods, especially just prior to exercise. Performance is improved when the liquid is consumed within 2 to 3 hours prior to exercise.

8

Training the Warrior

There are multiple weapons that can assist the warrior to attain superior performance while avoiding injury and muscle damage.

Warming Up and Cooling Down

Muscles, tendons and ligaments function optimally at a slightly higher temperature because there is increased oxygen delivery, better neuromuscular function, and a smoother muscular motion. A brisk walk or slow jog and calisthenics will increase the temperature so that a vigorous stretching program can begin. Cooling down also involves stretching, especially the muscles most used.

Stretching

Stretching can help minimize injury, misalignment, and muscle fatigue. Stretching should be done after a good warm up. Muscles and tendons generally relax after about 30-60 seconds of a steady holding pressure. Stretching too quickly can actually cause damage.

For a painful muscle, stretch and hold that muscle for 30-60 seconds, release the hold, then contract that muscle for 5-10 seconds, release the contraction for a few seconds, then stretch the muscle again for 30-60 seconds. Repeat this sequence five times. For an injured muscle, you can relieve pain by stretching every hour.

Strength Training

Strength training usually involves methods that improve strength in the central position of the body. But warriors need strength and balance peripherally as well. This can be accomplished using kettlebells in outstretched positions. Kettlebells have been used for centuries by military and athlete warriors.

Kettlebell training:

9

The Female Athlete

Full details and medical references of topics in this chapter can be found in The Truth About Breast Health – Breast Cancer, Prescription for Healing by Charles B. Simone, M.D., http://www.PrincetonInstitute.com , Princeton, NJ 2002.

BENIGN BREAST SYNDROMES

The term “benign breast syndromes” describes many disorders including fibrocystic breasts, lumpy breasts, chronic mastitis, mammary dysplasia, cysts, and others. Some physicians inappropriately label all the disorders as “fibrocystic disease.” About 60% to 80% of all women develop a benign breast disorder. Most benign breast disorder symptoms occur predominantly in women who menstruate. Benign conditions increase cancer risk.

Several factors contribute to the development of benign breast syndromes: (1) High-fat diet; (2) Lack of certain vitamins and minerals; (3) Caffeine – coffee, tea, colas, chocolate; (4) Nicotine, whether you smoke or inhale other's smoke; (5) Alcohol; (6) Hormonal changes.

Lumpiness or the feeling of grape-like structures is not the same as a single, large, dominate mass in the breast. Lumpiness is generally diffuse with predominance in the upper outer breast quadrants. **Dominant masses** include cysts, galactoceles (milk-filled cysts), and fibroadenomas – these must be distinguished from cancers. **Lumpiness size changes with the menstrual cycle**, **but the size of a single dominant mass does not**. Sometimes the difference between a dominant mass and generalized lumpiness is not very distinct.

Breast Swelling and Pain. You could have cyclical breast swelling that starts at ovulation with or without tenderness, or have breast pain that is either cyclical or

10

Simone Ten Point Plan for Superior Performance and Extended Life

The chance of achieving greatness is higher if you are well informed, and physically and mentally fit. An awesome competitor is a warrior who gains advantage because he/she is well informed, well trained, and practices proper Nutritional Hydration™ that enhances performance and positively influences the outcome. Continuation of these practices will extend life and decrease risk for cancer and cardiovascular disease, each disease affecting 2 of every 5 people. Lifestyle factors cause 80 to 90 percent of them. In fact, strict genetics cause less than 10 percent of our diseases. So we have control.

Risk Factors for Poor Performance, Cancer, Heart and Other Diseases

Risk Factor	Controllable
• **Nutritional** – Fat Intake, Fiber Intake, Vitamin/Mineral Intake, Food Additives, Caffeine Intake, Hydration	Yes
• **Obesity**	Yes
• **Tobacco Use**	Yes
• **Alcohol Use**	Yes
• **Drug Use**	Yes
• **Pesticides**	Yes
• **Environmental Factors** – Air Pollution (Outdoor, Ozone Depletion, Acid Rain), Indoor Pollution, Water Pollution and Treatment, Electromagnetic Fields	Yes
• **Radiation** – Sun exposure, Suntan Booths, Unneeded X-ray	Yes
• **Sexual-Social** – Female and Male Promiscuity, AIDS spread	Yes
• **Hormonal Factors** – Menarche*, First Pregnancy, Abortion or Miscarriage First Trimester of First Pregnancy, Benign Breast Disease, Failure to Repair Undescended Testicle, DES, Oral Contraceptive Use, Hormone Replacement Therapy, Androgen Use	Yes
• **Sedentary Lifestyle**	Yes
• **Stress**	Yes
• **Occupational Exposure Factors**	Yes
• **High Blood Pressure**	Yes
• **Lack of Comprehensive Physical Examination**	Yes
• **Age**	No

* A high-fat diet triggers early menarche.

11

Food Composition Tables

These tables show calories, protein, fat, and cholesterol content of specific amounts of foods,[1-6] and the approximate volume comparisons according to the US Department of Agriculture.[7] Choose foods that have the lowest fat content because fat slows you down, increases your weight, and increases your risk for cancer, cardiovascular disease, diabetes, and many other illnesses. So, avoid: (1) Four-legged animals; (2) Shellfish, (3) Dairy products unless it is skim or non-fat, and, (4) Soy. So what do you have left? You have two-legged animals (white meat), swimming fish only from the ocean, and everything that grows from the earth.

Eggs	**Calories**	**Protein gm**	**Fat gm**	**Chol mg**
Whole raw egg, 1	75	6	5	213
White, raw egg, 1	15	4	0	0
Yolk, raw egg, 1	60	3	5	213
Whole, fried egg	90	6	7	211
Whole, scrambled egg	100	7	7	215
Whole, boiled egg	75	6	5	212
Substitute egg liquid ¼ cup (61 g)	30	6	0	0

Fish (3 oz = 86 gm) *Volume of about a* ***deck of cards***	**Calories**	**Protein gm**	**Fat gm**	**Chol mg**
Cod	90	19	1	40
Flounder or sole, baked	80	17	1	59

INDEX

What People Say About This Book…

"Dr. Simone's book clearly shows what we need in terms of nutrition and hydration and why. It is based on experience and backed up by a valid bibliography. I have coached world-class athletes for 40 years and his suggestions reinforce my observations. Nutritional Hydration™ is for warriors, for athletes, and for anyone who wants to improve their health. A key theme is 'we have control.'"

Richard L. Brown, PhD, Physiology. Coached 16 athletes who participated in 28 World Championship and Olympic events

"As a competitive athlete since 1975 and a coach since 1992, I have been exposed to all kinds of information supposed to help athletes. Dr Simone's book is the authoritative body of information for which we have long searched to maximize our performance without harm, and keep us healthy long after we retire from competition. Every athlete, athletic trainer, and coach needs this book. You owe it to yourself."

Cyle Sage, Former Captain US Navy Triathlon Team 1998-2000 Two-time US Olympic Committee Developmental Coach of the Year, Triathlon; Nat'l Collegiate Club Men's Mile Record 2007

"In my twenty-five years as a coach, I know that Dr. Simone's book, Nutritional Hydration, is an important piece of the puzzle that I will add to my training. If you are an athlete, or a coach, you're cheating yourself if you don't read this book.

John McKenna, First Strength Coach Inducted into New Jersey State Coaches Association Hall of Fame

"Dr. Simone's book is fantastic and enlightening! It keeps it simple so all coaches, athletic trainers, and athletes can understand it."

Paul VanLieshout, Head Men's and Women's Swimming Coach The Catholic University of America, Washington, D.C.

"I have 40 years experience as a competitor, multisports trainer and coach. At age 52, Dr. Simone motivates me to re-examine my preparations. The Military, athletes from grade school to the elite, and soccer moms, should all implement his teachings to stay healthy and improve their fitness, endurance, performance, and recovery."

Coach Tony Quinn, Retired US Air Force; Founder/President, Washington State Trail Running, Walking and Duathlon Club

"Dr Simone's book creates an opportunity for an enormous competitive edge that our collegiate athletes have embraced immediately. The positive impact on our athletes' performance has been immediate and significant. I'd like to hide this book from my opponents!"

Stephen Fletcher, Head Coach, Men's and Women's Swimming and Diving, NCAA Division 1, Rider University, Lawrenceville NJ