HOLE IN ONE

NUTRITION


BCAA's
Vit D
Fish Oil
Probiotics
Mg
Magnesium

UIATQUI DOLORA ET EST, QUI SANDIPSANT
ACCABO. LUMQUIST PELES DOLENDIPSA

Water

Lymph

94%

83%

Joints

83%

79%

Heart

Lungs

80%

75%

Brain

Muscles

75%

86%

Liver

22%

83%

64%

Minor degree of hypohydration adversely influences cognition: a mediator analysis[1]

David Benton, Kimberly T Jenkins, Heather T Watkins, and Hayley A Young*

Department of Psychology, Swansea University, Swansea, United Kingdom

ABSTRACT

Background: Because the assumption that small changes in hydration status are readily compensated by homeostatic mechanisms has been little studied, the influence of hypohydration on cognition was examined.

Objectives: We assessed whether a loss of <1% of body mass due to hypohydration adversely influenced cognition, and examined the possible underlying mechanisms.

Design: A total of 101 individuals were subjected to a temperature of 30°C for 4 h and randomly either did or did not consume 300 mL H_2O during that period. Changes in body m s, urine osmolality, bo mperat d th monitored. isodic mem sed a ntion, m d, a the rceived d culty of ta s wer asured on occ ons he d were ana zed with t use o a on-l oad where we looke les diated the influence of hypohydration on psychological functioning.

Results: Drinking water improved memory and focused attention. In the short-term, thirst was associated with poorer memory. Later, a greater loss of body mass was associated with poorer memory and attention (mean loss: 0.72%). At 90 min, an increase in thirst was associated with a decline in subjective energy and increased anxiety and depression, effects that were reduced by drinking water. At 180 min, subjects found the tests easier if they had consumed water.

Conclusions: Drinking water was shown, for the first time to our knowledge, to benefit cognitive functioning when there was a loss of <1% body mass at levels that may occur during everyday living. Establishing the variables that generate optimal fluid consumption will help to tailor individual advice, particularly in clinical situations. This trial was registered at clinicaltrials.gov as NCT02671149. *Am J Clin Nutr* 2016;104:603–12.

Keywords: attention, cognition, dehydration, hypohydration, memory

experimentation, even though hydration status plays a role in all aspects of bodily functioning and in many chronic diseases (3). Therefore, because the first signs of subclinical nutrient deficiency are typically psychological in nature (4), aspects of cognition were examined in individuals who were hypohydrated.

A review of the psychological consequences of mild dehydration showed that, when body mass fell >2%, there were mood changes; reports of fatigue increased, whereas alertness declined (5). However, the effects on cognition were less consistent. The relevance of such conclusions to individuals who are going about their everyday life is unclear because it unl ly t s 2% ma will occur often. Fo xample, du g dan, w no food or liquid is consume by Muslim om sunris sunset, t e is typically a loss of on 1% of b mass (6). Nevertheless, to our knowledge, the as mption l changes in hydration status are readily compensated has not been systematically considered; in particular, the point at which fluid loss affects mental performance has not been established. Brain-imaging studies that have examined subjective thirst have shown increased activation in the anterior cingulate and decreased activation in the parahippocampal gyri (7). Because it is unclear whether these changes have other functional consequences, and these brain areas are associated with both focused attention (8) and episodic memory (9), these variables were examined.

Currently, because there are no adequate biomarkers of hydration status, recommended intakes of water in the United States are based on median intakes (3). These figures can only be valid to the extent that current intakes are optimal and that there are not marked differences in individual needs. In addition, the guidelines simply provide optimal daily intake, which raises the question of whether, within 1 d, there may be times when hydration status is less than optimal. Therefore, the objective of the current study was to consider whether a loss of <1% of

Dehydration Decreases Dynamic Strength

Rob Skinner, MS, RD, CSCS

Athletic trainers, coaches, and strength coaches closely watch athletes for signs of dehydration. They, like many sports health professionals, know that it's critical to avoid dehydration if optimal performance and health of athletes is to be maintained. Now, a recent study[1] published in the *Journal of Strength and Conditioning Research*, suggests that avoiding dehydration may be as important to strength training athletes performing maximum lifts as it is to endurance and team sport athletes.

The study, conducted at Old Dominion University in Virginia, examines the effect of dehydration equivalent to a 1.5 percent loss of body weight on one-repetition maximum (1RM) performance in 10 trained male power lifters. Treatments were randomly assigned [illegible] were obtained in a crossover design [illegible]

and 1RM bench press as during E treatment. After the D 1RM was determined, subjects rested for two hours and consumed water until they reached their pre-dehydrated weights. After this rest period, they conducted another bench press (R).

After dehydration, 1RM bench press performance was [illegible] pounds lower than the first maximum lift performed in a well-hydrated state (E1). However, the 1RM lift performed after rehydration was not significantly different than the first euhydration maximum lift (E1).

Interestingly, during E there was a 2.5 percent decrease in the 1RM bench press from the first to second lifts (E1 to E2), which were separated by two hours. The authors indicated that this small decline in performance, despite maintenance of hydration, might have been due to decreased motor unit activation and/or afferent feedback from the exercising muscle. See Figure 1 for a graphical display of the experimental results.

Table 1 Study Protocol

Euhydration Test		Warm up, 1RM(E1)	2- hour rest	1RM (E2)
Rehydration (R) Test	Sauna-induced dehydration to - 1.5% body weight	Warm up, 1RM(D)	2-hour rest drinking fluids to regain 1.5% body weight	1RM (R)

Euhydration

Dehydration
Rehydration

• Baseline performance was established during a euhydration treatment (E). In a well-hydrated state, the power lifter subjects performed a warm-up and then determined a 1RM bench press (E1). Then, they rested for two hours before conducting another 1RM (E2).

• A second treatment involved dehydration/rehydration (D/R). To accomplish dehydration, the subjects were passively dehydrated (performing no exercise) by sitting in a sauna until each lost 1.5 percent of their body weight. Dehydration at this level equates to a loss of 3.75 pounds for a 250-pound weight lifter. Dehydration was confirmed by a decrease in systolic blood pressure, plasma volume and an increase in hemoglobin, hematocrit and heart rate, all indicators of a hypovolemic state.

Once dehydrated, subjects then performed the same warm-up

Given these results, it's clear that strength [illegible] 1RM lifts, can be affected by dehydration of less than two percent of body weight. The good news is that rehydration through oral fluid intake can restore an athlete's ability to perform 1RM lifts during training. These results underscore the importance of hydration for every athlete in the weight room.

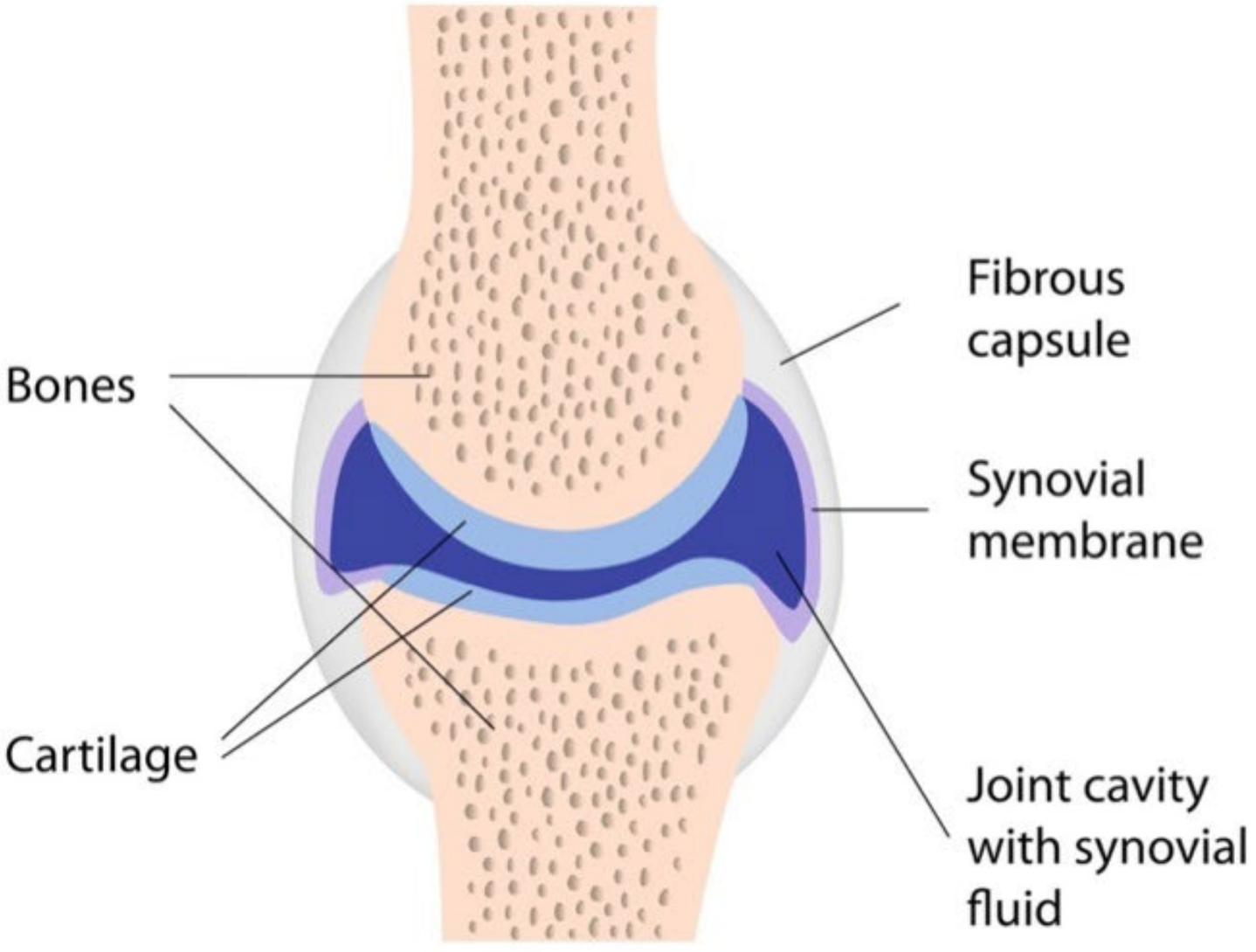
Rob Skinner, registered dietitian and certified strength and conditioning specialist, is director of sports nutrition at the Georgia Tech Athletic Association. He works with athletes from 17 different NCAA sports, as well as Olympians and players from the NFL, NBA, and MLB.

For more information on nutrition for strength training, visit the Sports Science Center at GSSI sections at www.gssiweb.com.

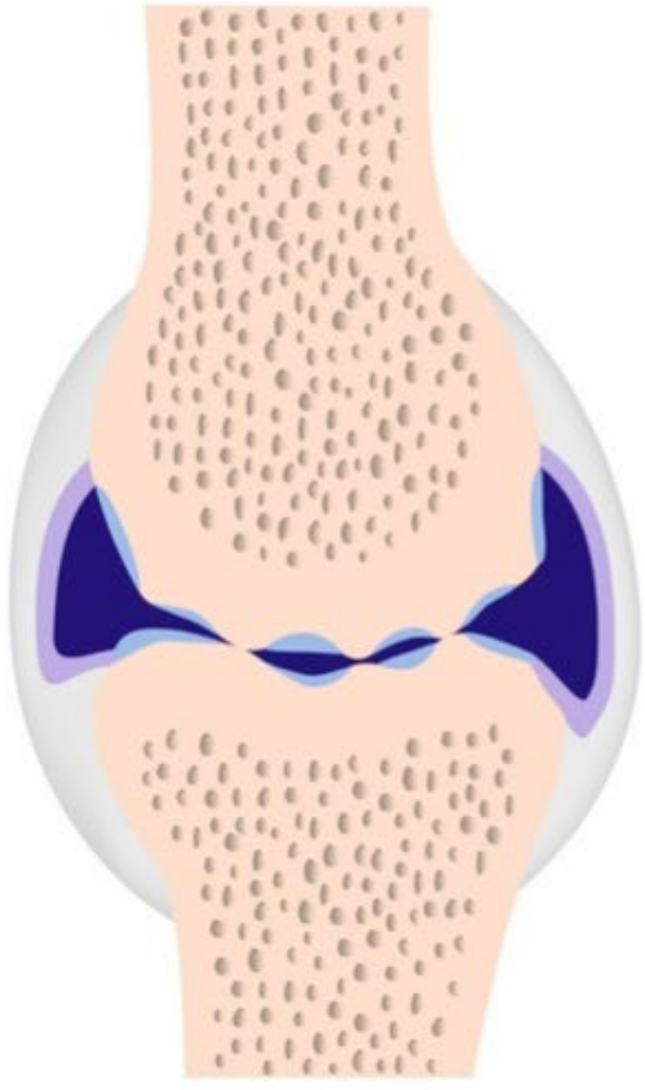
1 Schoffstall JE et al. *J. Strength Cond. Res.* 15(1):102-10[illegible]

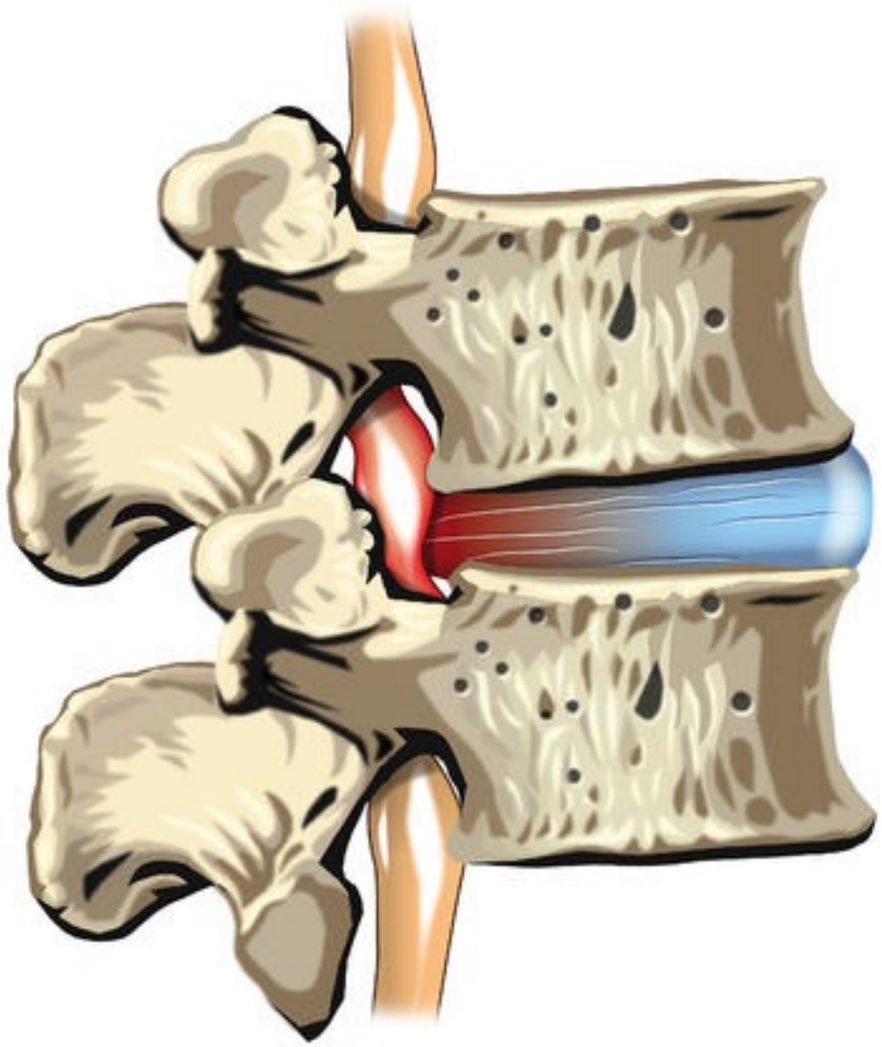
Synovial Joint

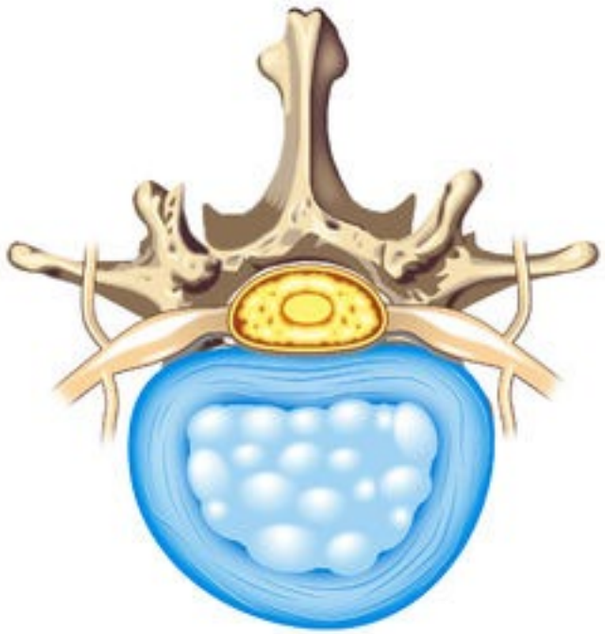
Healthy joint

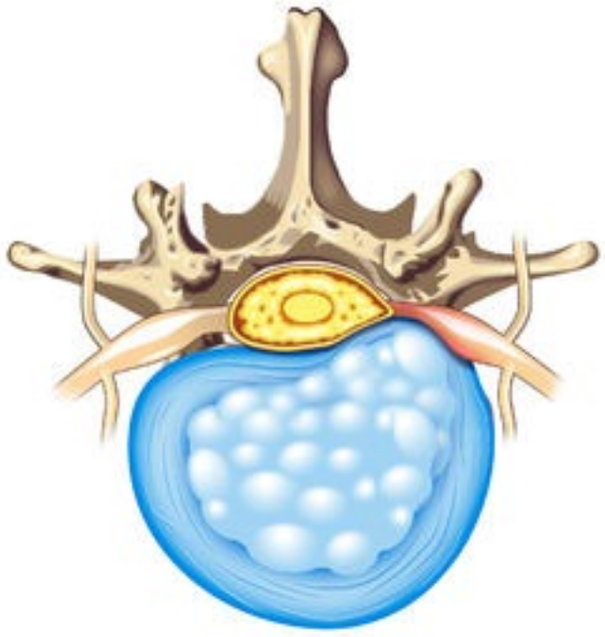


Osteoarthritis



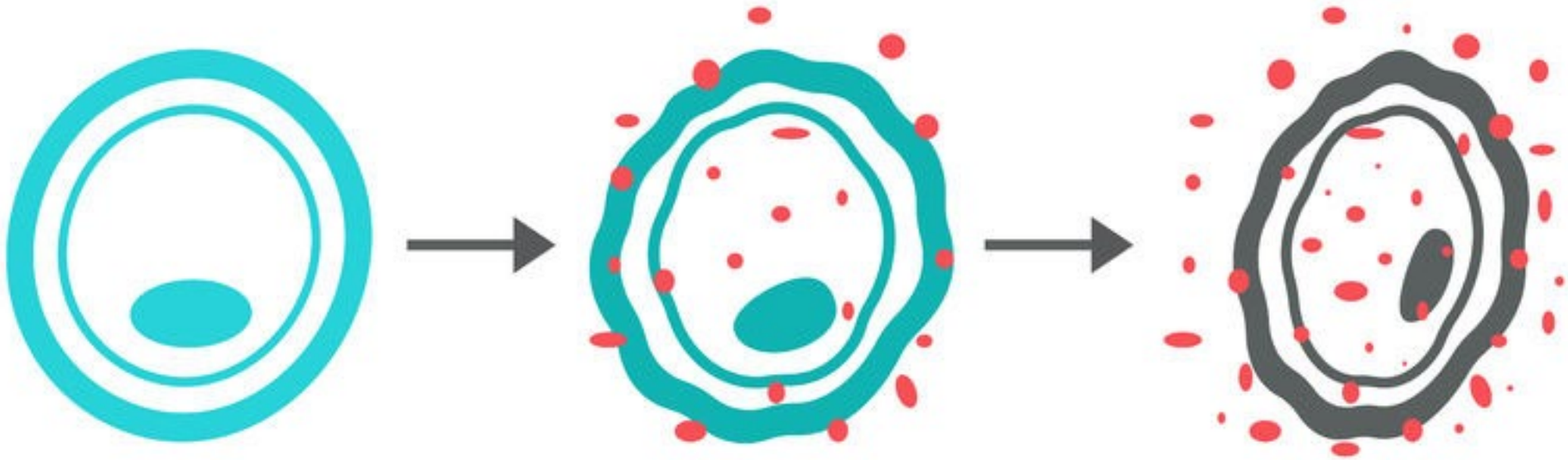







DETOX

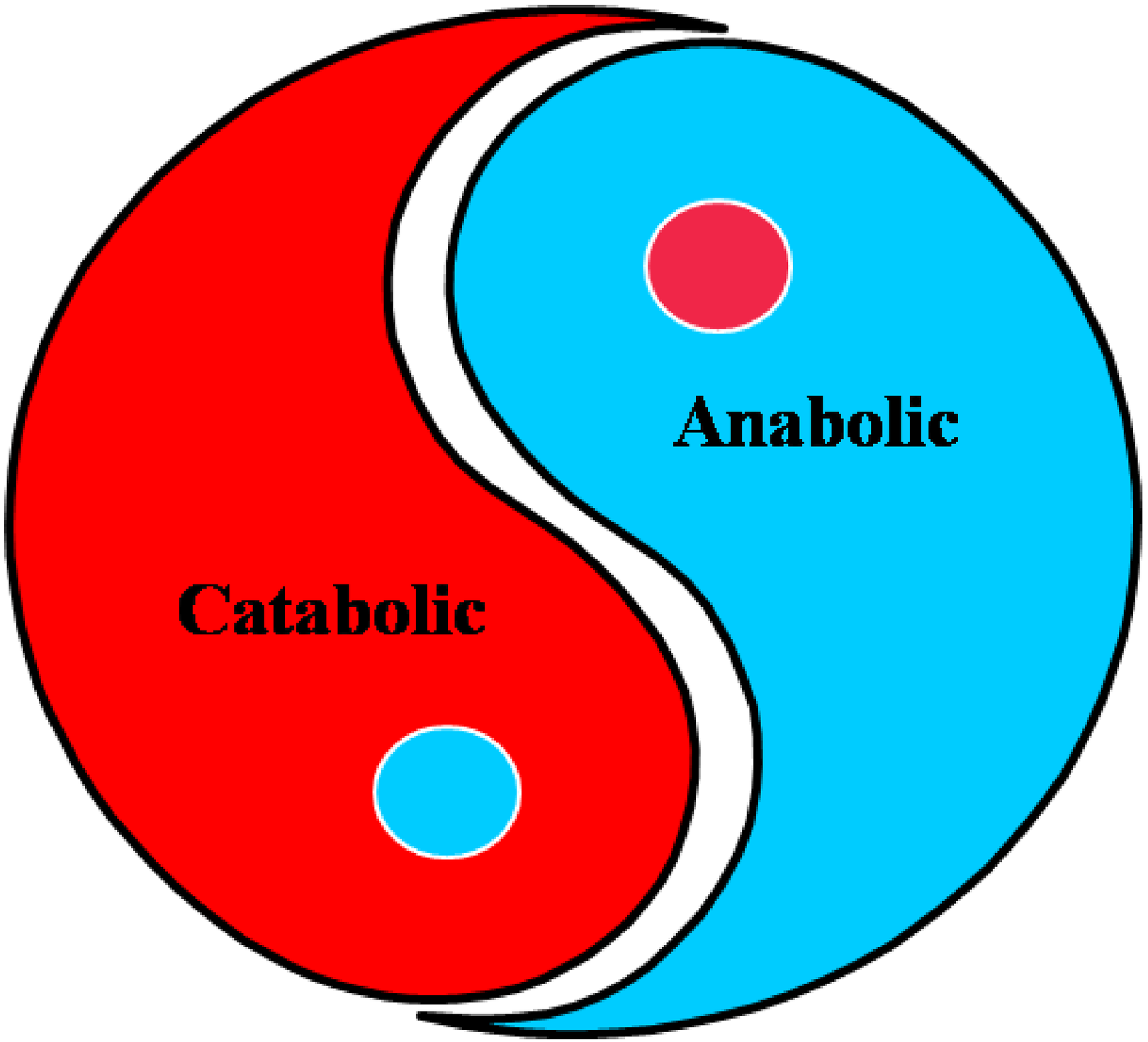
OXIDATIVE STRESS



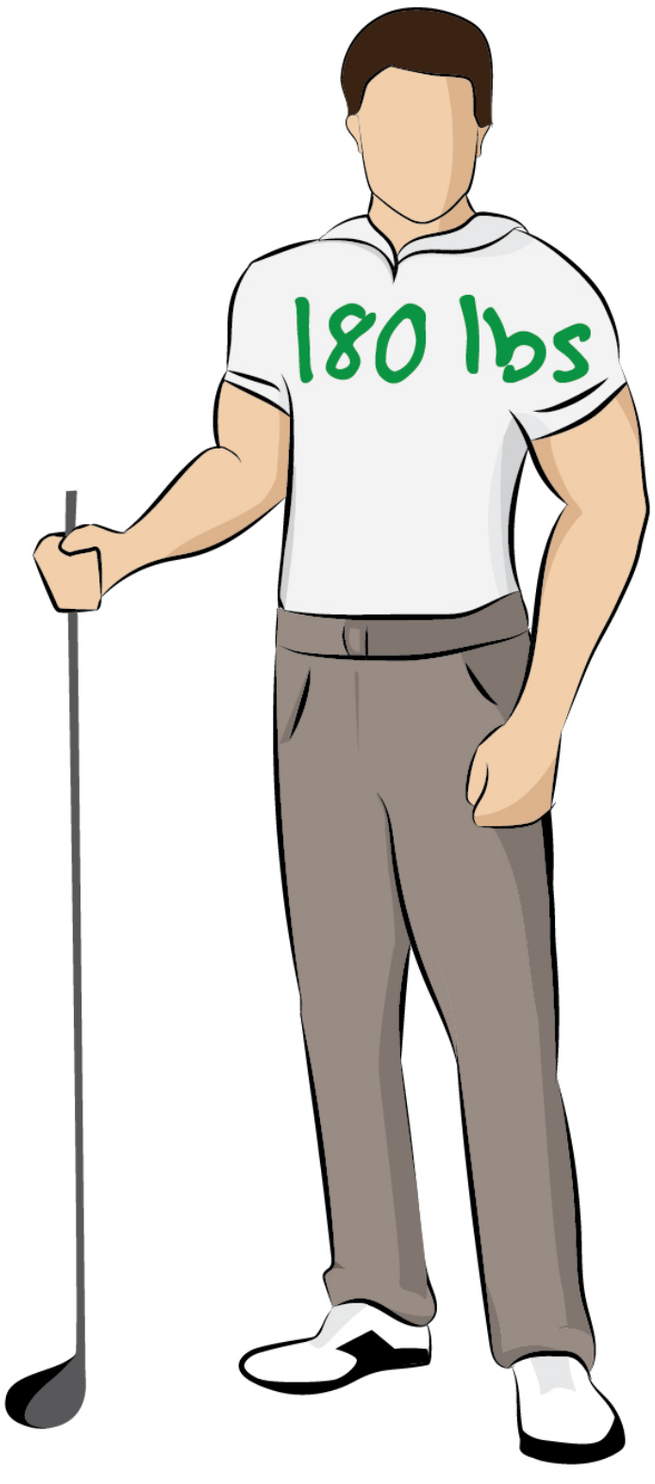
Normal Cell

Free Radicals
Attacking Cell

Cell with
Oxidative Stress


Anabolic
Catabolic


designs for health®
RECOMMENDED BY FUNCTIONAL MEDICINE PROFESSIONALS
#1 PRACTITIONER SUPPLEMENT BRAND
Creatine Monohydrate Powder
Muscle building and strength†
Dietary Supplement
Net Wt. 16 oz (1 lb) 450 g
MUSCULOSKELETAL HEALTH†
Professional Use Only
Performance† | Recovery† | Cognitive Function†



÷ 2 = 90 ounces of H_2O


0.5L
CARBONATED FLAVOR SOFT DRINK
FRESH
COLA
DRINK
0.5L
CARBONATED FLAVOR SOFT DRINK
FRESH
LEMON
DRINK
0.5L
CARBONATED FLAVOR SOFT DRINK
FRESH
ORANG
0.5L
CARBONATED FLAVOR SOFT DRINK
FRESH
GRAPEF
0.5L
CARBONATED FLAVOR SOFT DRINK
FRESH
RASPBERR

TIMING IS
EVERYTHING

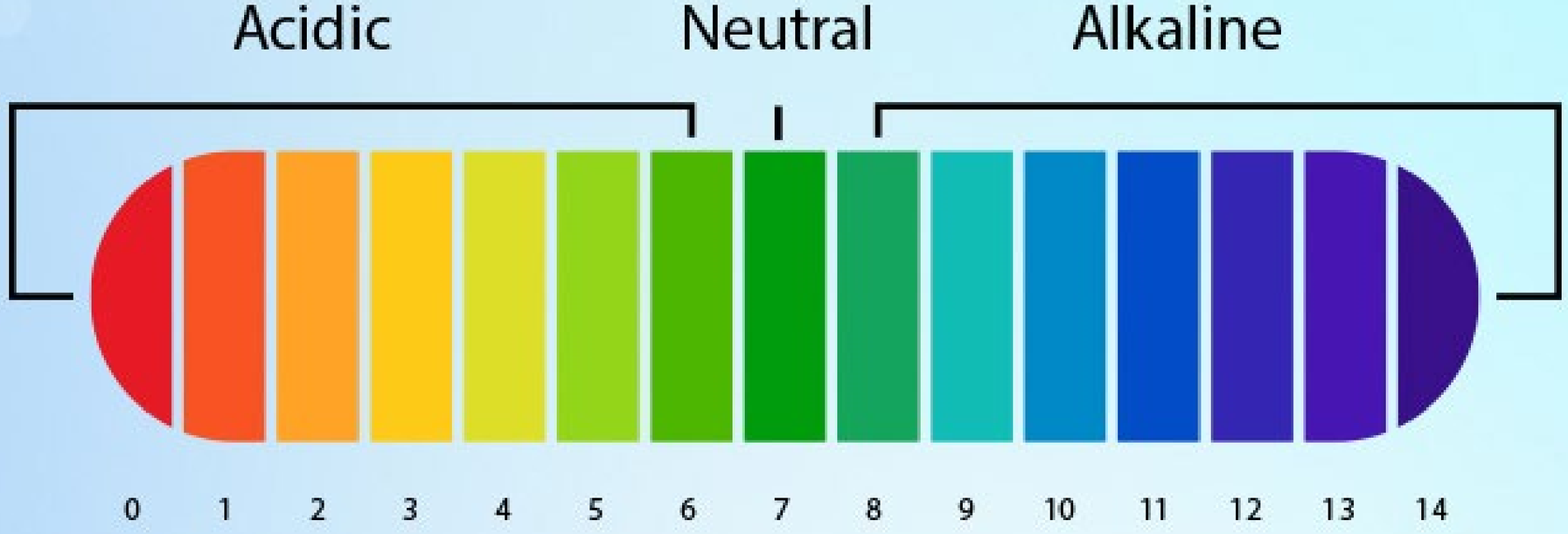
Insensible Fluid Loss

25

50

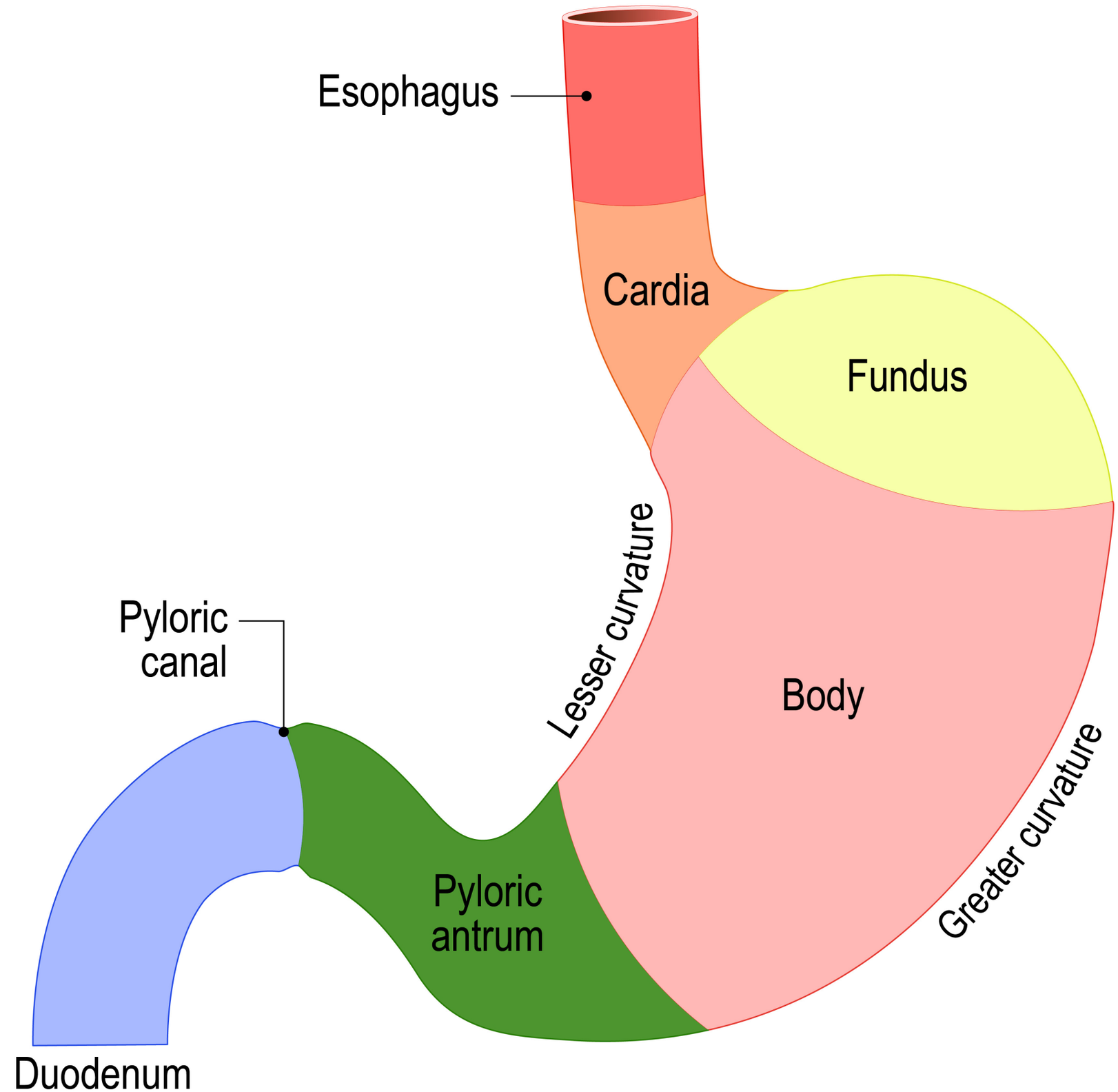
25


ALKALINE WATER
9.5+
pH
PERFECT
HYDRATION
+electrolytes
Made from
100%
RECYCLED
PLASTIC
12 x 1L BOTTLES



Alkaline Water pH Levels: A Quick Guide

Sections of human the stomach




ROCKST★R
ENERGY DRINK
Red Bull
ENERGY DRINK
8.3 FL OZ
burn
MONSTER
ENERGY
Full Throttle
Energy Drink


LEMON-LIME
WITH B VITAMINS
FRUIT PUNCH
WITH B VITAMINS


Your Everyday Salt
Votre sel quotidien
SELINA NATURALLY
FAMILY OWNED
SINCE 1976
DEPUIS 1976
ENTERPRISE FAMILIALE
• Exquisite Taste
Goût exquis
• Unrefined Mineral Salt
Sel minéral non raffiné
• Kosher Certified
Certifié kascher
1976
CELTIC SEA SALT
FINE GROUND/SEL FIN
This salt does not supply iodide, a necessary nutrient.
Ce sel ne fournit pas d'iode, un element nutritif necessaire.
Vital Mineral Blend
Mélange Vital de Minéraux
Net Wt. 1/2lb (Poids net 227 g)


Redmond
LIVE YOUR JOURNEY
REAL SALT
AMAZING TASTE
UNREFINED MINERAL SALT
MINED IN AMERICA
PERFECT FOR EVERYDAY USE
ANCIENT FINE SEA SALT
THE GREATEST SALT ON EARTH
FINEST
Is Your Salt Rea
THIS SALT DOES NOT SUPPLY IODIDE, A NECESSARY NUTRIENT.
Net Wt. 10 lbs. (4356g)

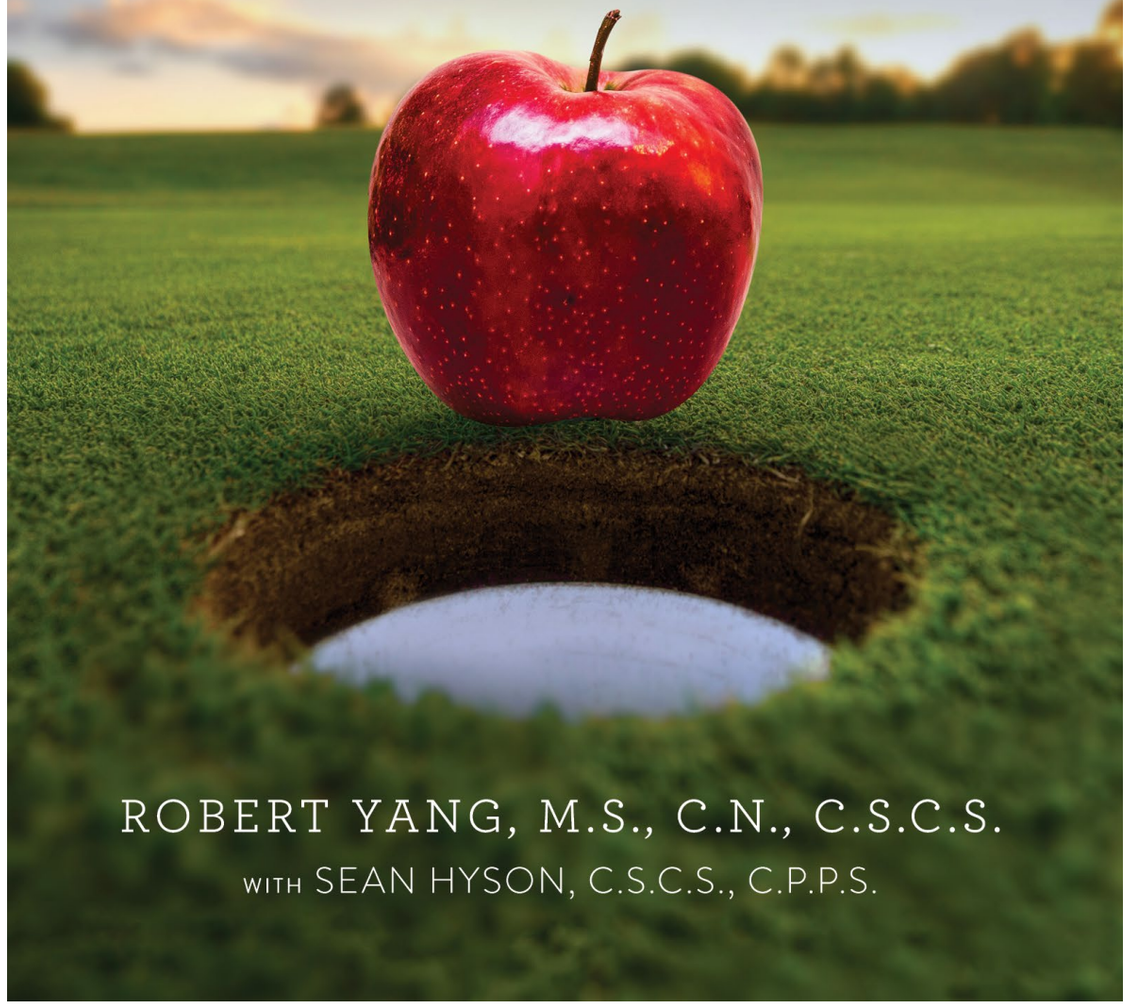

BCAA's
Vit D
Fish Oil
Probiotics
Mg
Magnesium

Personal Hydration Challenge

- Drink half my body weight in ounces of water for the day
- Avoid any drinks with sugar
- Drink 25% of my total intake of water FIRST THING IN THE MORNING
- Add 1 pinch of Celtic Sea Salt or Redmond's Sea Salt to every liter (32 oz) of water
- Drink 50% of my total water intake during a round or golf practice

Hole-in-One Nutrition

A GUIDE TO FUELING BETTER Ggolf



ROBERT YANG, M.S., C.N., C.S.C.S.

WITH SEAN HYSON, C.S.C.S., C.P.P.S.