



Nutritional and Metabolic Wellness

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Health is a state of complete harmony of the body, mind and spirit. When one is free from physical disabilities and mental distractions, the gates of the soul open.

–B.K.S. Iyengar, yoga master

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Learning Objectives

- Current “normal” has transitioned away from genuine wellness.
- Genuine wellness must remain the plumb line for human wellness.
- Salutogenesis is an important foundation for wellness healthcare.

3.1 Introduction to Human Wellness

Have you noticed the trend to perceive type 2 diabetes as a “normal” condition after age 50? Have you noticed the trend to perceive a little arthritis pain in the joints as a “normal” condition after age 40? These conditions have become so prevalent that adults are trending to consider these conditions as the “normal” for states of health. The “normal” today in this time of epidemic chronic disease is promoting amnesia of true wellness.

3.2 What Is Wellness?

Wellness certainly means freedom from the debilitating, weakening effects of chronic disease. As a side product of this level of wellness, one feels dynamic, energetic, alive, vital, and vibrant. From this healthy state, we can respond effectively to environmental stress, toxins, or infections, quickly returning to our previous state of health and wellness [1].

Health and vitality refer to your life energy and the power to live, grow, know the purpose in life, and express your

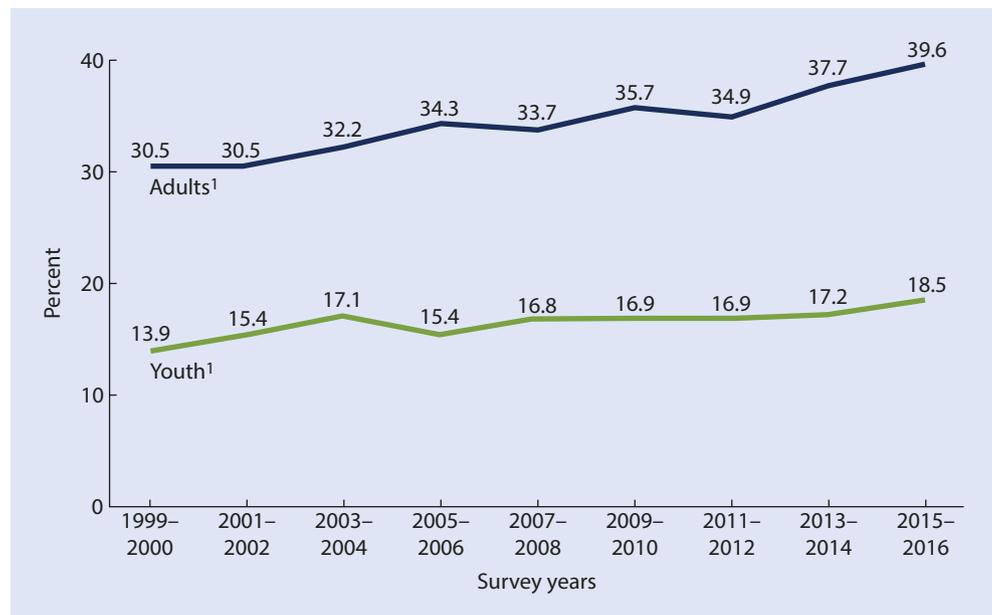
maximum potential as a human being. Individual lives are made up of many facets, all interconnected. Nutrition provides the energetic and physical foundation for achieving wellness as defined by Hershoff in all its dimensions.

Before exploring the principles surrounding restoration of wellness from chronic disease, it is important to recognize that we must set a clear vision of the health goals for each patient. Throughout human history, humanity has faced many challenges in the search for health and longevity, and people have culturally developed ways of life to function successfully. There is ongoing speculation by experts in human biology that the current state of global health is being challenged by the beginning of declining lifespan [2, 3] and fertility [4].

It is important that we identify the biomarkers that define and characterize the human wellness we are striving to restore in our patients. The “normal” of current populations has already deviated significantly from states of wellness. There is no better example than the current epidemic of obesity that is being predicted as the twenty-first century begins: Upwards of three-fourths or more of industrialized countries’ populations are predicted to be obese (>30% ideal body weight) by 2030 [5]. In 1962, research statistics showed that 13% of America’s population was obese. By 1980 it had risen to 15%, to 23% by 1994, and to an unprecedented 39.8% of adults by 2016. According to the Centers for Disease Control and Prevention, the percentage of overweight children ages 6–11 has nearly doubled since the early 1980s, while the percentage of overweight adolescents has almost tripled [6]. These overwhelming research statistics reveal an alarming obesity trend, the need for diagnosis, and a call to action [7, 8] (■ Fig. 3.1).

CDC research statistics on American obesity tell us that 63% of adult Americans and 18.5% of children and adolescents have a body mass index (BMI) in excess of 25.0 and are therefore overweight; more than a quarter surpass 30.0, qualifying as obese [9]. Obesity is becoming the “norm,” even

■ **Fig. 3.1** Trends in obesity prevalence among adults aged 20 and over (age-adjusted) and youth aged 2–19 years: United States, 1999–2000 through 2015–2016 (Hales 2017).
¹Significant increasing linear trend from 1999–2000 to 2015–2016. NOTES: All estimates for adults are age adjusted by the direct method to the 2000 US census population using the age groups 20–39, 40–59, and 60 and over. Access data table available at ► https://www.cdc.gov/nchs/data/databriefs/db288_table.pdf#5. (SOURCE: NCHS, National Health and Nutrition Examination Survey, 1999–2016)



though it is not an example of wellness. That is a staggering thought when we realize the relatively short period of time during which this epidemic has occurred. Obesity is strongly related to the incidence of chronic disease. As the obesity trend increases, human models of wellness are becoming rarer. Humans tend to gravitate toward acceptance of what is prevalent as “normal” and may tend to forget the real wellness we are seeking to restore. Health practitioners must keep the definition of true wellness before them as a standard with which to compare their patients.

3.3 Biomarkers of Wellness

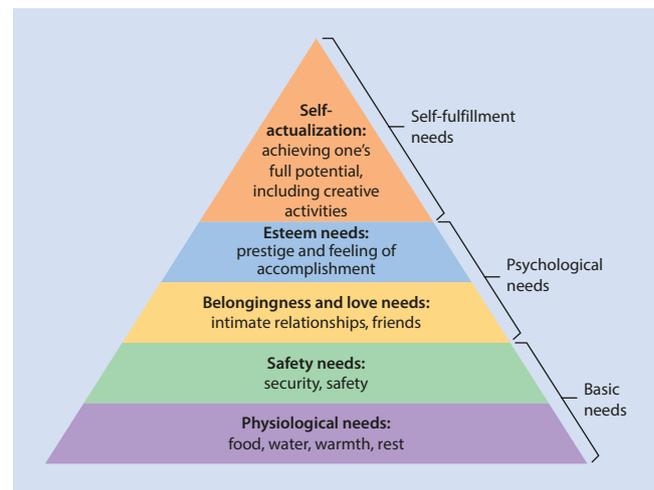
What are the biomarkers for wellness? This chapter presents suggestions for a framework for markers to assess wellness, for which further development is welcome. At least it is a good foundation developed from many studies in the last century that evaluated common characteristics of human populations who achieved excellent function, life fulfillment, and good reproduction capacity during their relative longevity. Currently, it is proposed within the longevity science community that a 115-year lifespan is a realistic goal [10].

Thanks to the efforts of various scientists in the past 70 years, there has been research stimulated by scientific curiosity regarding the populations who have stretched longevity and wellness to the upper limits. Humans confirmed to have attained the age of 110 years or more are referred to as *supercentenarians*. Identifying factors that help people remain healthy, vigorous, and disability-free at older ages is a major research priority of longevity scientists. The most recent study is that of Dan Buettner named *The Blue Zones* – those pockets of societies with the most healthy centenarians and generally healthy populations [11].

Common factors that have measurable biomarkers among the healthiest societies are repeatedly found to be:

1. Unprocessed, whole foods, plant-rich diet (diet history; nutrient status)
2. Caloric and nutrient intake so as to maintain a healthy Weight (anthropometrics)
3. Regulating insulin production [12] (blood glucose/insulin fasting; HgbA1C)
4. Moderate daily physical activity (minutes per day or week; handgrip strength)
5. Small amount of alcohol frequently (daily female ≤ 1 serving; men 1-2 servings daily)
6. Strong community and social connectivity (1–10; 10 highest)
7. Meditation and spiritual beliefs (time per week)
8. Feeling of purpose in life (1–10; 10 highest)

The diets of these longevity-rich societies vary according to cultural traditions, but all contain a high intake of whole vegetables and fruits and beneficial food oils. Interestingly, these foods are rich in the phytonutrients, the most recently identified nutrient group [11].



■ Fig. 3.2 Hierarchy of needs

The way you think, the way you behave, the way you eat, can influence your life by 30 to 50 years. –Deepak Chopra

Throughout the community of integrative and functional medicine practitioners’ concepts like Maslow’s hierarchy of needs have developed [13] has agreement that the following factors are key influencers that summarize the findings of many studies on longevity and wellness:

“Basic needs”: Biological, physiological, and safety needs

1. Foods (protein, fats, carbohydrates, fiber)
2. Vitamins, minerals, accessory, or conditionally essential nutrients
3. Light, water, and air
4. Movement rhythm
5. Circadian rhythm balance
6. “Mind-body needs”: Love, belongingness, self-esteem, cognitive, aesthetic, and self-actualization needs
7. Meaning and purpose
8. Love, community, connection

All seven are inherently interrelated in the context of the human experience that affects wellness (■ Fig. 3.2).

3.4 Biochemical Individuality/Health Standards Through the Lifespan

As the professional rules of thumb for nutritional status assessment are developed in subsequent chapters, it will be seen that the environmental conditions necessary to produce the identified markers of wellness are biochemical, clinical, behavioral, and functional and change throughout developmental stages of the lifespan. The following are some of the primary stages of the lifespan with suggestions for considerations to assess and manage to promote wellness for each stage. These are of particular importance to increase the health of a person and their nutritional status within the area of chronic disease management:

3.4.1 In Utero

- Fetal nutrition: promote healthy musculoskeletal-organ-tissue fetal growth
- Maternal:
 - Hormonal health: adrenal, thyroid, insulin, and others
 - Blood glucose management
 - Emotional environment: calm and joyful
 - Rest: adequate rest, sleep, and exercise
 - Nutrition status: adequate vitamin D25-hydroxy, iodine, DHA, iron, folic acid, protein, minerals, beneficial oils, antioxidants, and phytonutrients, to promote good growth and protect tissue from free radical damage [14]
 - Avoid toxin exposure
- Grandmaternal nutrition status: same as mother, avoidance of toxins to avoid epigenetic transgenerational effects
- Paternal nutrition status: important 2 years prior to conception, avoid toxins, and especially 14 days prior to fertilization

3.4.2 Infant (From Birth to 6–24 Months)

- Breastfeeding infant nutrition: promote healthy musculoskeletal-organ-tissue fetal growth
- Maternal lactation and caretaker:
 - Emotional environment: calm and joyful
 - Rest: adequate rest, sleep, exercise
 - Hormonal health: adrenal, thyroid, insulin especially
 - Nutrition status: adequate vitamin D25-hydroxy, iodine, DHA, iron, protein, minerals, antioxidants, and phytonutrients to promote good growth and protect tissue from free radical damage and adequate fluid intake
- Home environment: stable, caring, joyful
- Infant 6 months + oral nutrition: balanced organic whole foods, hypoallergenic diet
- Infant:
 - Vaccination wisdom
 1. Never when sick
 2. Wait until 4+ months if possible
 3. Mercury- and formaldehyde-free
 4. Extra nutritional antioxidant support and folic acid prior to a vaccination
 5. Consider vaccination alternatives for at-risk infants with poor methylation family history or genetics
 - Safe sun exposure for vitamin D production (never burn)
 - Fresh air and exercise and play

3.4.2.1 Toddler (12–36 Months)

- Positive parenting.
- Seriously consider vaccination need/avoid unnecessary/mercury- and formaldehyde-free.

- Child safety environment.
- Nutrition: Regular meals of organic/low-toxin food containers and nutrient-dense, balanced whole foods.
 - Protein
 - Calcium- and mineral-rich foods
 - Nuts/seeds
 - Fish or fish oils/EFA balance
 - Whole grains
 - Sea salt/herbs/spices
 - Fruits and vegetables
 - Onions/garlic (sulfur/bioflavonoid)
 - Cruciferous vegetables (sulfur/indole-3-carbinol)
 - Leafy greens (folic acid, chlorophyll, magnesium, etc.)
 - Fermented or cultured foods (yogurt/kefir/sauerkraut/miso/tempeh)
 - Sea vegetables (iodine/minerals)
 - Vitamin A- and D-rich foods/supplements if indicated
- Sun exposure (promote Vitamin D) (or supplementation cod liver oil >40° latitude).
- Play and exercise.

3.4.2.2 Childhood (3–12 Years)

- Continue toddler recommendations.
- Educational programs.
- Self-esteem-building lifestyle.
- Nutrition: Ensure adequate protein/calcium/minerals for rapid musculoskeletal growth – possible increased needs during this growth period.
- Sun exposure almost daily – cod liver oil during winter if >40° latitude.
- Develop food preparation self-skills.
- Develop hygiene practices – especially oral and dental care habits.
- Sleep: 9–10 hours with bedtime routine/quiet and dark environment.
- Focus on oral/dental care: avoid mercury amalgams, orthodontics that include removal of teeth, as well as prevent periodontal diseases and decay by daily dental hygiene and regular dental cleanings.

3.4.2.3 Teenage (13–19 Years) (▣ Fig. 3.3)

- Continue childhood nutrition recommendations.
- Strong family base/good relationships with parents and teachers.
- Avoid “junk food” and “toxin exposure” (cigarettes, drugs, environmental).
- Possible need for extra sleep.
- Weight-bearing regular exercise (peak time for bone density building for adulthood).
- Develop advanced food preparation and self-care skills.
- Creative outlets for interests.
- Begin to develop purpose in life.
- Abstinence/avoid communicable diseases/avoid birth control pills (upsets hormonal balance, depletes folic acid).



■ Fig. 3.3 Teenage energy and vitality. (2005© Diana Noland)

- Focus on oral/dental care: avoid mercury amalgams, orthodontics that include removal of teeth, as well as prevent periodontal diseases and decay by daily dental hygiene and regular dental cleanings.

3.4.3 Young Adult (20–34 Years)

- Continue teenage nutrition recommendations.
- Whole foods; low-toxin organic foods, containers, and cookware; balanced, nutrient-rich diet.
- Moderate daily exercise.
- Avoid toxins.
- Seriously consider vaccination need/avoid unnecessary/mercury- and formaldehyde-free.
- Prepare health for possible pregnancy or fathering – even if not planning. Caution about use of birth control pills (BCP) related to the nutrient-drug depletions of

folic acid, magnesium, zinc, and other B complex vitamins to promote select malnutrition (i.e., those depleted in folic acid are at more risk for HPV infection which is related to increased sexual activity, more prevalent with use of BCP).

3.4.3.1 Middle-Age Adult (35–54 Years)

- Continue young adult recommendations with nutrition focus.
- Focus on nutrition to support healthy aging with phytonutrients, healthy fatty acid balance, minerals, methylation and sulfation nutrients, and hormonal and immune support nutrition like vitamin D.
- Focus on oral/dental care: avoid periodontal diseases/decay/misalignment.
- Continue to focus on weight-bearing exercise to maintain good bone density throughout the lifespan.

3.4.3.2 Seniors (54–74 Years)

- Continue to focus on nutrition to support healthy aging with phytonutrients, healthy fatty acid balance, minerals, methylation and sulfation nutrients, and hormonal and immune support nutrition like vitamin D.
- Focus on gastrointestinal health as digestive function wanes naturally in elderly.
- Good oral hygiene and health.
- Maintain healthy percentage of body fat composition and weight.
- Weight-bearing exercise.
- Emphasize social connectedness, especially around food quality and meal time.
- Stress management.
- Adequate sleep.

3.4.3.3 Old-Old Seniors [15] (75–99 Year)

- Continue to focus on nutrition to support healthy aging with phytonutrients, healthy fatty acid balance, minerals, methylation and sulfation nutrients, and hormonal and immune support nutrition like vitamin D.
- Focus on gastrointestinal health as digestive function wanes naturally in elderly.
- Weight-bearing exercise.
- Safe environment to meet basic needs.
- Emphasize social connectedness, especially around food quality and meal time.
- Maintain healthy percentage of body fat composition and weight.
- Weight-bearing exercise.
- Continue to focus on nutrition to support healthy aging with phytonutrients, healthy fatty acid balance, minerals, methylation and sulfation nutrients, and hormonal and immune support nutrition like vitamin D.
- Safe environment to meet basic needs.
- Residential support system with family or caring friends (► Boxes 3.1 and 3.2).

Box 3.1 Key Markers of Childhood Wellness

- No cavities
- Sturdy
- Strong
- Cheerful disposition
- Not overweight
- No allergies
- Manages stress
- Emotionally stable
- Sleeps soundly
- Straight teeth
- Learns easily
- Good concentration
- Optimistic
- Lots of energy
- Rarely sick
- Strong digestion

Box 3.2 Key Markers of Human Wellness

1. HEALTHY BODY WEIGHT: $\pm 10\%$; %BODY FAT:
M < 18%/F < 25% with no observable central adiposity
2. HEALTHY SKIN: color, tone, texture, free of lesions, abnormal moles, itching, pain
3. HEALTHY DIET: balanced whole foods and low-toxin diet, water
4. HEALTHY EMOTIONS: caring, social connectedness, relationships, purpose in life, self-esteem, community/family involvement, appropriate emotions
5. HEALTHY ORGAN SYSTEMS FUNCTION: including blood glucose management resulting in stable insulin blood levels
6. HEALTHY IMMUNE SYSTEM: infrequent illness, illness only of mild nature with quick recovery, absence of chronic disease, absence of allergies
7. HEALTHY MOVEMENT: adequate energy and ability to exercise, run, jump, play, and lift appropriate weight, no pain
8. HEALTHY MUSCULOSKELETAL: Strong grip, strong muscles for walking and running, no aches and pain, no broken bones or sprains
9. HEALTHY REPRODUCTION/FERTILITY: Throughout lifespan normal gonadal development, fertile, no pain with menses (F), no STDs, sexual health, healthy birth delivery, symptom-free menopause
10. HEALTHY GASTROINTESTINAL SYSTEM: 2–3 BM/day, good digestion, no flatulence
11. LONGEVITY to >110 years old with high-quality function and life
12. LOW-TOXIN exposure lifestyle

3.4.3.4 Centenarians/Supercentenarians (100+ Years)

- Emphasize social connectedness, especially around food quality and meal time.
- Maintain healthy percentage of body fat composition and weight.
- Weight-bearing exercise.
- Continue to focus on nutrition to support healthy aging with phytonutrients, healthy fatty acid balance, minerals, methylation and sulfation nutrients, and hormonal and immune support nutrition like vitamin D.

- Safe environment to meet basic needs.
- Residential support system with family or caring friends.

3.5 Nutritional Wellness

Nutrients come from food, and food comes from the environment. While taken for granted at an intellectual level, this nutrient-food/food-environment relationship is not something citizens of industrialized nations usually consider in their everyday lives [16]. Consumer awareness of food-toxic harmful events over the past 30 years due to media reporting has increased consumer food safety concerns. The increasing frequency of recalls of contaminated food, findings of animals with “mad cow disease,” chickens with avian flu viruses, the fish supply testing high in mercury and PCBs, endocrine disruptors, and others presents a growing concern for the quality of the food supply. The message is coming through loud and clear to society that environment plays an integral part in food safety.

The human community must ensure safe food and agricultural practices as a priority in this new era of toxicity, superbugs, and depleted soils, ensure to reverse trends, ensure environmental safety of the food supply, and enable humanity to have wellness within its grasp.

A nutritional environment for wellness results from an attitude of guardianship over the food supply. A wellness environment requires a global food supply of diversity in geography, climate, exposure to toxins, and many other variables. It involves ensuring the food is not depleted and does not contain dangerous level of toxins [17]. The food that produces wellness requires human care in policies and agriculture in every stage from soil to plate.

3.6 Community of Wellness

Throughout history, humans have been brought together around the table, a symbol of congregation, family, and community, where we celebrate loved ones. Food is a central part of a healthy community. It provides not only bodily nourishment but also nourishment to the soul from the care taken in raising, gathering, and preparing the food and in the relationships and connectedness forged and strengthened during the meal. In the larger community of a nation, the societal mores about food and the wellness of the population affect people’s health. It is important to elevate the societal value of health and wellness within global communities so they guard the soil, water, food supply, food industry, healthcare systems, and governmental policies. The tremendous knowledge of human metabolism gained by each generation has the potential to positively influence populations to improve every individual’s opportunity to be well and live a full life. There is an imminent need for an alignment of society’s thinking with the newer discoveries of nutrition science to implement lifestyle basics and policies that are key to thriving in wellness.

Salutogenesis is a concept that literally means “that which gives birth to health.” It is a term that has not been well known since its creation by Antonovsky in 1979 [18]. In traditional public health and community medicine approaches, the focus is the opposite: on disease or illness and its prevention or treatment. This latter focus most often dominates interventions. In the communities where longevity and quality of life are most prevalent, the culture of salutogenesis prevails. Adoption of a salutogenic perspective highlights the importance of starting from a consideration of how health is created and maintained. Contrary to industrialized societies where medical care and “healthcare” focus on “pathogenesis,” salutogenesis is the inverse [19].

The salutogenic paradigm needs to suffuse all members of a community as it focuses on the promotion of global well-being rather than the origins of specific disease processes. The focus on wellness strategies and lifestyle choices empowers individuals to experience the full spectrum of the human experience. A community of interconnected individuals and families is necessary to activate the force of wellness and develop the ability to empower others to lead salutogenic lives and to transform our culture into one of worldwide wellness.

3.7 Summary

- True wellness achieves a life that is dynamic, energetic, alive, vital, and vibrant.
- Salutogenesis is a paradigm of a healthcare approach of how to create and maintain health.
- Twelve markers of human wellness.
- The healthiest societies on earth have a good diet and lifestyle in common.

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