Chapter Two – The Biopsychosocial Model for Yoga in Healthcare

This chapter provides the basis for culturally sensitive partnership of the yogic *(panca maya)* biopsychosocial model (BPS) with the World Health Organization's (WHO) International Classification of Functioning (ICF), Disease, and Health (WHO 2001). Maximizing their interrelationship can help manage obstructions to health, wellness, and precursors of "dis-ease", which will be discussed in a case study format for practical application. Evidence for blending rehabilitation and yoga continues in this chapter, and methods for operationalizing a yogic BPS model are also reviewed.

Outline

- Challenges Facing 21st Century Healthcare
- The Biopsychosocial Model
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- Biopsychosocial Assessment
- Influencing Change Behavior
- Crossing the Threshold into Effective Chronic Disease Management and Health Promotion: What Medicine Needs To Thrive

- Defining Disability and Health Functioning Models
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Challenges Facing 21st Century Healthcare

In 1948 the World Health Organization confirmed its definition of health as being "a state of complete physical, mental, and social well-being and not merely an absence of disease" (WHO 1948). Yet, health care systems in many countries still struggle to embrace its full meaning amidst rising healthcare costs that are inversely proportional to health outcomes. The 20th century required a shift in medicine from acute disease to chronic and lifestyle disease management (Dean et al., 2011, Wahdan 1996), underscoring a real need for a shift in thinking in health care (Pomeroy 2012, Van Hecke et al., 2013, Elliott et al., 2002). The WHO estimates that out of 58 million deaths in 2005, 35 million could be directly attributed to chronic disease (WHO 2005).

Chronic pain is also on the rise. The International Association for the Study of Pain (IASP) and the European Federation of IASP Chapters estimate 120 million adults, 20% of the world population, suffer from pain worldwide, while 1 in 10 adults are newly diagnosed with chronic pain each year (Goldberg & McGee 2011, IASP 2012). A reported one in three adults has trouble living independently due to chronic pain (Goldberg & McGee 2011). The IASP reports the major categories of chronic pain suffering are cancer, osteoarthritis and rheumatoid arthritis, surgeries and injuries, and spinal problems. The diversity of causes and their comorbidities make pain management a multi-faceted and interdisciplinary task (Goldberg & McGee 2011, Pergolizzi et al., 2013). Some of the comorbidities correlated with chronic pain include diabetes, arthritis, depression, irritable bowel syndrome (Bonaz & Bernstein 2013) and asthma (Kato et al., 2006, Krein et al., 2005, Piette & Kerr 2006, Bair et al., 2003, Arnow et al., 2006, Hestbaek et al., 2006, Goldberg & McGee 2011).

Patient satisfaction is also stymied, with the Institute of Medicine (IOM) endorsing the BPS in their 2011 report, Relieving Pain in America: A Blueprint for Transforming Prevention, Care, Education, and Research, the patient-centered BPS model of care has been shown to be the

most effective and cost-effective way to address pain. IOM Committee member, Myra Christopher, states "Effective pain management is a moral imperative, a professional responsibility, and the duty of people in the healing professions" (Tawoda 2012).

With the chronic disease rate projected to increase another 17% over the next ten years (WHO 2005), yoga is a viable low-cost option for intervention. A sixty-year meta-analysis supports yoga as a possibly superior intervention to conventional standard physical activity in the geriatric population (Patel et al., 2012), while a 2010 literature review (Ross & Thomas) supports yoga as being as effective or superior to exercise for both healthy and diseased populations. Yoga is also effective for a range of chronic disease processes and addiction issues through affecting biomarkers for inflammation such as C-reactive protein (CRP) and cytokines, cardiovascular, psycho-emotional and physiological health, and immune function (Ross and Thomas 2010, Pullen et al., 2008, Bijlani et al., 2005, Tekur et al., 2012, Streeter et al., 2012, Kuntsevic et al., 2010, Kochupillai et al., 2005).

Yoga's multi-faceted methodology including breathwork, meditation, movement, and lifestyle counseling, can affect

what the WHO (2005) identifies as the largest risk factors for premature aging and mortality, including:

- unhealthy diet,
- physical inactivity,
- poor lifestyle,
- choices that lead to obesity,
- cardiovascular disease,
- diabetes, and
- several types of cancer.

Personal responsibility also affects health outcomes, even more so than medical intervention (Kaufman 2012, Pomeroy 2012). Therefore the positive influence of yoga philosophy to affect variables that improve patient adherence and outcomes, including self-management and increasing health locus of control, confidence, and self-efficacy (Cramer et al., 2013), could serve two chief purposes in chronic disease prevention and management.

The Biopsychosocial Model

The BPS conceptual model proposed in this text is based on recommendations from the Institute of Medicine, the WHO's ICF model, and an evolution of the five-limbed yogic BPS *[panca* (five) *maya* (pervading)*]* model (IOM 2011, WHO ICF

2002, Easwaren 2007). The BPS model has been validated with a multitude of populations, including:

- cerebral palsy (Andrade et al., 2012, Jonsson et al., 2008, Rosenbaum and Stewart 2004),
- diabetes (Awad and Alghadir 2013),
- bilpolar disorder (Ayuso-Mateos et al., 2013),
- multiple sclerosis (Conrad et al., 2012),
- stroke (Glassel et al., 2013),
- low pack pain (Glocker et al., 2013),
- distal radius fracture (Harris et al., 2005),
- in general physical therapy and rehabilitation (Jette 2006, Bartlett & Lucy 2004),
- breast cancer (Khan et al., 2012),
- morbid obesity (Lin et al., 2013),
- osteoarthritis (Oberhauser et al., 2013), and
- hand conditions (Scorza et al., 2013, Rudolf et al., 2012).

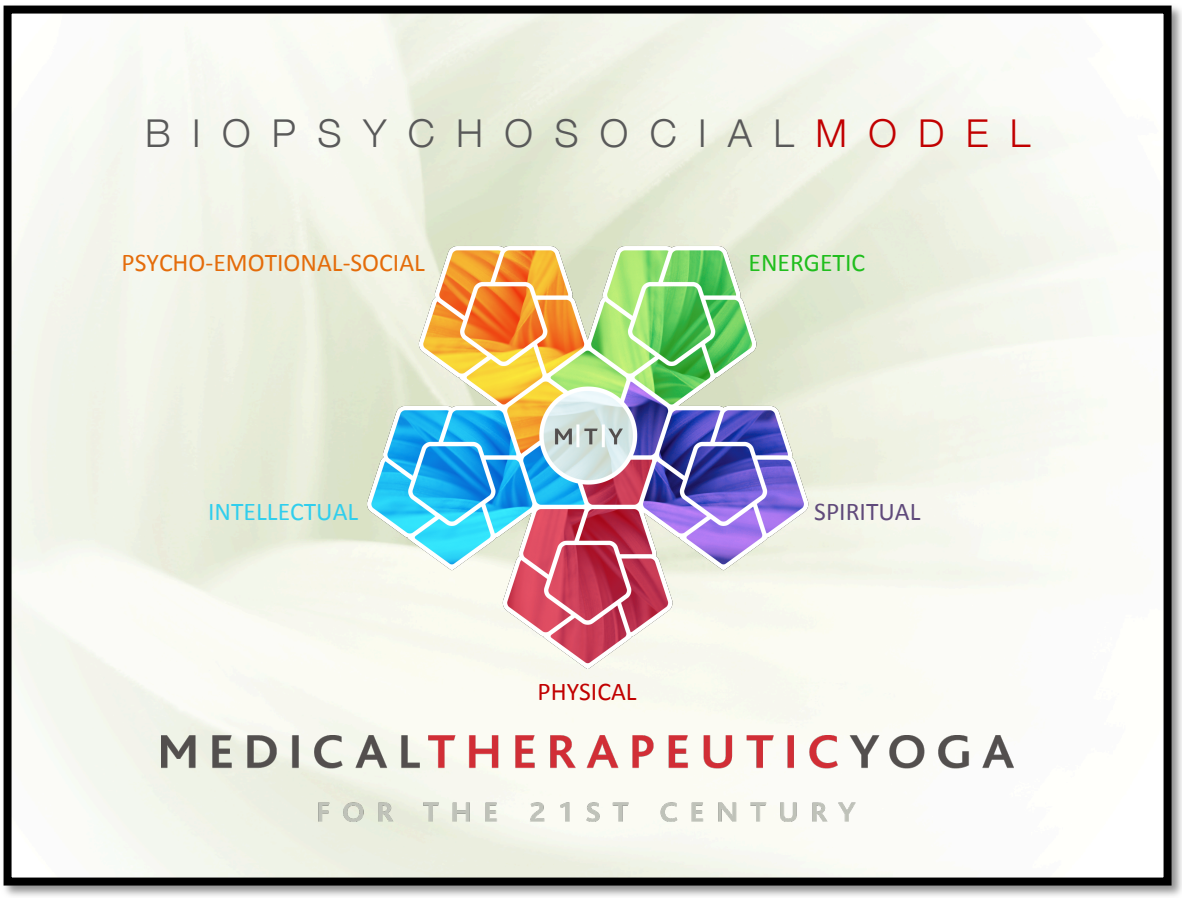


Figure 2.1 Yogic Biopsychosocial Model

The WHO ICF model, a BPS template for delivery of health care, recognizes that the metric of the human condition, including personal and environmental factors, do play a role in determining a person's level of disease or functioning, and therefore, must be considered in patient care. The BPS model offers (Rosenbaum & Stewart 2004, Bartlett & Lucy 2004):

- A range of entry-points for intervention in medicine.

- Inclusion of social support and community resource health promotion.
- A more holistic, patient-centered template for clinical decision-making.
- The opportunity for more effective communication between patient and practitioner.
- Improved patient satisfaction and patient outcomes through addressing the whole person, instead of just a diagnosis.
- Evidence-based medicine and research in a compassionate and individualized way.
- A “universally accepted conceptual framework to define and classify disability” (Scorza 2013, pg 1).

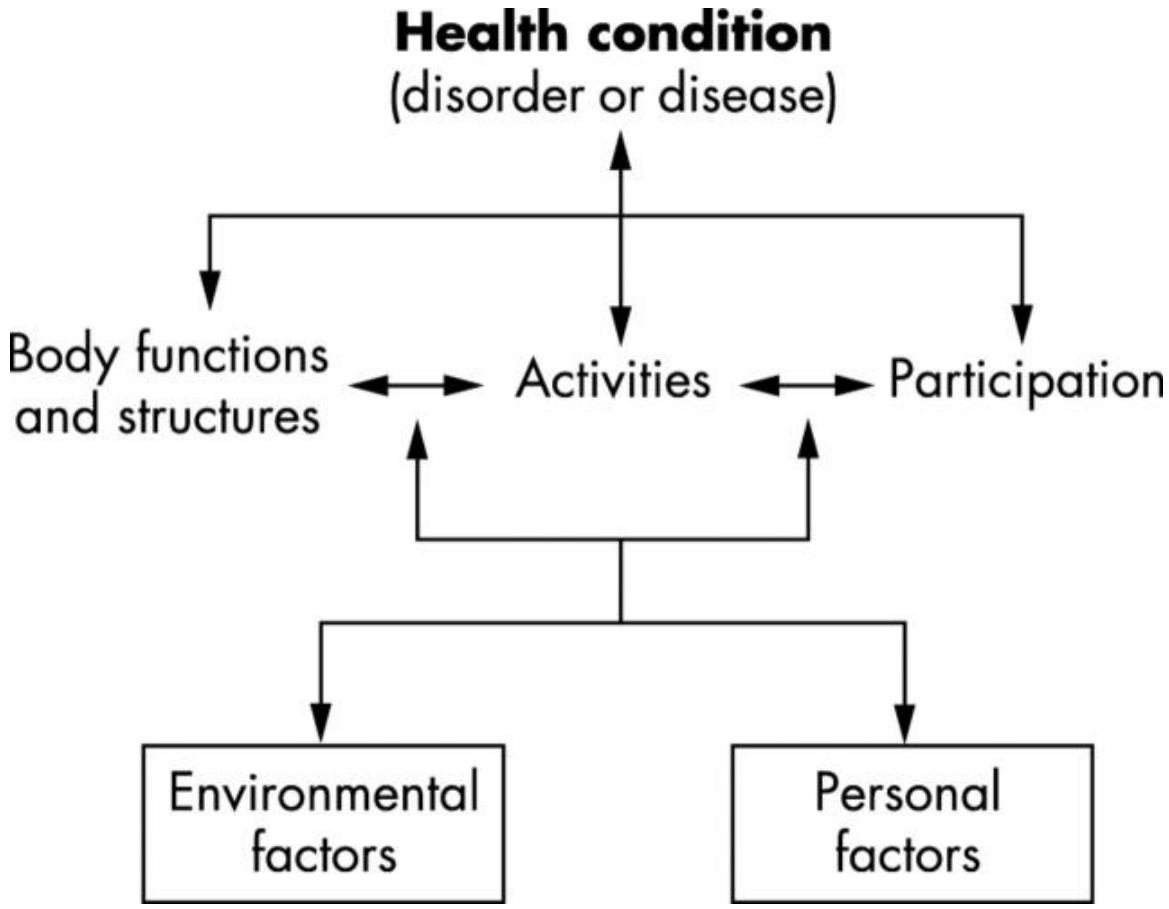


Figure 2.2 World Health Organization's International Classification of Disease, Functioning, and Health Model (Reprinted with permission from the World Health Organization).

Using the Yogic Biopsychosocial Model

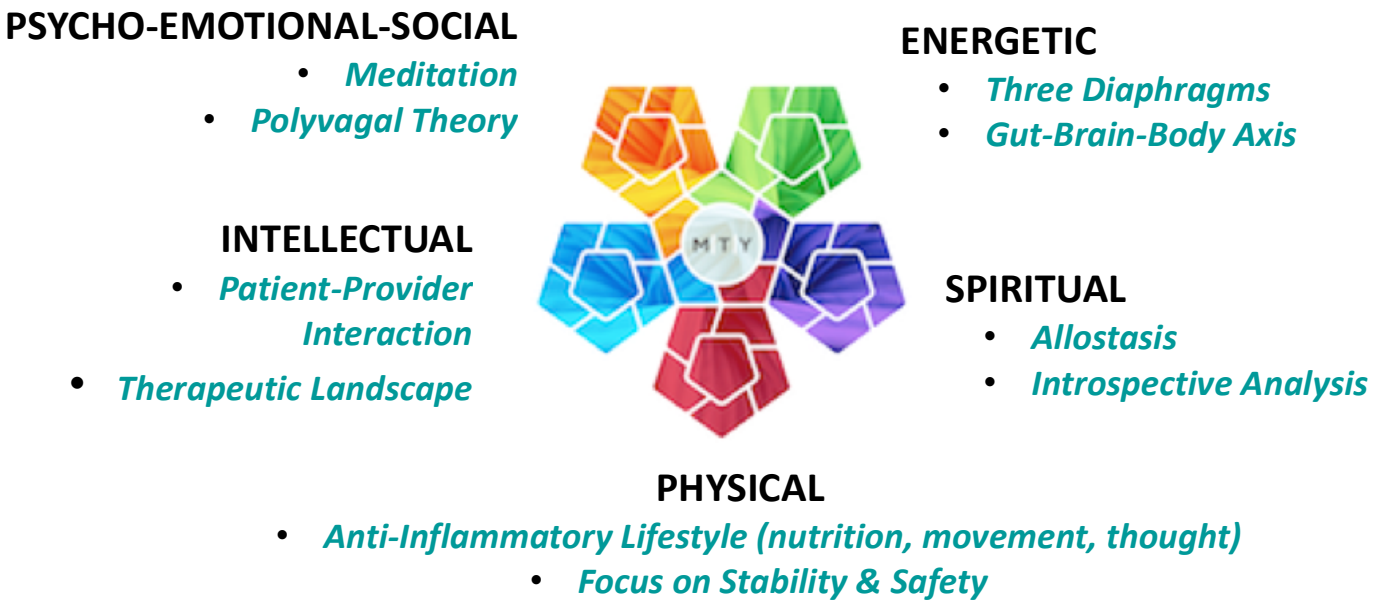
When the BPS model is used in the yogic system, the clinician should recognize that personal and environmental factors intimately affect psychobiological health and well-being, as outlined in the WHO's ICF model as well as:

- Address all five dimensions, recognizing that each one is valuable and critically interrelated in a circuitous relationship rather than a hierarchical one.
- Acknowledge that change is an inherent part of developing awareness. The yogic model fosters questioning one's frame of reference and habits of thought in order to come to or appreciate a new understanding (Mezirow 2003). In other words, freedom requires transformation or the willingness to change. Mezirow's Transformational Learning Theory (TLT) allows for questioning the way social roles are inhabited, how clinical findings are interpreted based on those past experience and concepts of personal authorship, and in what context patients are viewed (hopefully as a whole rather than a diagnosis, which is only part of a whole).

The five dimensions of the yogic model as described in the *Taittiriya Upanishad*, titled as "Ascent to Joy" or degrees of happiness, are as follows (Easwaren 2007):

1. Material body, physical and nutritional sheath (*Annamaya [ahn-nuh mah-yuh]*)
2. Vital sheath, Energetic body, life force, breath *(Pranamaya [prah-nuh mah-yuh])*
3. Mind, emotional, social body, discrimination *(Manomaya [mahn-noh mah-yuh])*

4. Intellectual body, wisdom/discrimination *(Vijnanamaya [vignyah-nuh mah-yuh])*
5. Bliss body, spiritual, individual connected with the divine/soul *(Anandamaya ([ahn-nahn-duh mah-yuh])*



Empowering patients to take responsibility for their health depends on focused, biopsychosocial assessment.

Figure 2.3 Biopsychosocial Model Overview

Biopsychosocial Assessment

Because each of the five dimensions is inter-related, assessment takes place on a continuum rather than in a vacuum. Psycho-biological stress and allostatic load can be

directly influenced by yoga (Streeter et al., 2010, Bijlani et al., 2005, Kuntsevich et al., 2010, Tekur et al., 2012, Yang 2007, Anderson & Taylor 2011) through multi-modal yoga prescription, but not least of all, via influencing vagal nerve activity and parasympathetic nervous system interaction with the hypothalamic-pituitary-adrenal axis (HPA Axis) (De Couck et al., 2012, Ross & Thomas 2010, Noggle et al., 2012). These discoveries make yoga a powerful, if not necessary, modality for use in medicine, especially for the plethora of diseases influenced by stress.

Subjective Intake

Assessment begins with subjective intake. This typically occurs via patient interview, observation, and a thorough review of intake forms to screen for systemic red flags. Factors to review and discuss include:

- Previous medical history (PMH) – review of general systemic health
- History of present illness (HPI) including current medications, diagnoses, and treatments
- Pain (Pain analog scale, or PAS) patterns
- Patient's personal goals for therapy

Subjective intake should also consider the patient's report including their daily routine that includes:

- Activity (previous, current, and preferred level, type)
- Nutritional habits - a three-day food diary is recommended.
- Social support system
- Psycho-emotional health, including inter- and intrapersonal relationship
- Environmental surroundings and effects on health at work and home, including climate and ergonomic factors

Objective Intake

The objective intake includes five facets:

1. *and 2. Physical & Energetic Assessment* through the Functional Movement Algorithm (FMA): The FMA offers a method for global BPS assessment based on individual interaction with, and stress response to, yoga postures and breath. It is driven by four major objective domains concerned with regulation of allostatic load, discussed in chapter five, that also considers the non-tangible and more esoteric philosophy of energy anatomy and life-force, or *"prana."*

2. *Psycho-emotional or Stress Response Observation* - The psycho-emotional-social limb or pentagon corresponds with mindful practice of not only postures and breathing, but interaction with the self and others. Yoga, through breathing, meditation, or posture practice, can affect all-health outcomes through modifying our perception of stress and stress response. Ability to change the stress response, through a meditative state, can be responsible for neural plasticity and cerebral cortex thickening, which can "improve memory, attention, thought, and language" (Khalsa 2013).
3. *Intellectual Observation:* The intellectual pentagon of the model, the gateway for transformation, is aptly translated as the "transformational body" in yoga (Easwaren 2007). Our duty as healthcare providers is to discern individual's needs and help them change behavior through genuine, motivational interaction and communication with them (Lundahl et al., 2013, Benarous et al., 2013). The intellectual limb or pentagon ultimately determines the health of the person since it determines willingness, motivation, and readiness for change behavior. The majority of health problems in the 21st century are preventable or remediable by health behavior change (Rollnick et al., 2008, Dean et al.,

2011), which means the future of health care will focus on behavior change and is largely concerned with patient adherence and motivation in order to affect chronic lifestyle-related conditions (Dean 2009).

4. *Spiritual Inquiry:* Impacting spiritual readiness includes fostering directed action for mind/body connection and introspective awareness that is commensurate with the individual's personal belief system. Easily the most avoided aspect in health care, the spiritual facet of health can be correlated with religious belief, non-theistic groundings, and/or the ability of a person to connect meaningfully with the world around them.

Other assessment that can occur separate from, but in concert with, administration of the FMA, includes:

- Systemic differential diagnosis
- Lifestyle assessment via constitutional testing (Ayurvedic analysis, nutrition and epigenetics of nutrition, and a systems-approach to gut microbiota management).
- Environmental analysis (consideration of therapeutic landscape, including ergonomics or home safety). An important variable influencing treatment outcomes is the therapeutic landscape and actual physical intervention. The conceptual framework provided by Miciak et al.,

(2012) addresses the idea, and importance, of providing a safe, therapeutic landscape and setting where healing can take place, something that is of great importance in using yoga as medicine. The physical qualities of the therapeutic environment and the intervention logically represent the physical pentagon of the BPS model and occur through consideration of green space on health, well-being, and social safety (Groenewegen et al., 2006). Further, the consideration of therapeutic landscape in yoga is of particular interest in the medical or clinical setting, where access to natural, serene, or calm environments can be scarce (Hoyez 2007). An ideal landscape can be achieved in many settings, despite the globalization of yoga, through making simple changes such as eliminating overhead fluorescent lighting, changing wall or flooring colors or coverings, and generally considering green-space in clinical settings.

- Blood chemical analysis including CRP (C-Reactive Protein) level, Vitamin D, and diurnal cortisol level, for example. Vitamin D deficiency has been connected to sleep apnea, metabolic syndrome, obesity, diabetes, osteoporosis, preeclampsia, and cardiovascular disease (Erden et al., 2013, Kienreich et al., 2013, Ryan et al., 2013, Scholl et al., 2013), while skewed cortisol and CRP

levels have been well established, earlier in this text, as increasing chronic disease and mortality risk.

- Use of standardized outcome psychometric measures with a BPS context (chapter 12) such as the Short Form (SF)-36. The SF-36 measures functional health and well-being from the individual adult's point of view (Quality Metric 2013) and is a likely candidate for use because of its BPS framework (versus biomedical) and support from the WHO (2001) and its ability to measure self-efficacy, readiness for change, and health beliefs. The SF-36 does not screen for sleep and nutrition, so they must be assessed separately since lack of sleep and poor nutrition (Morris et al., 2009) are well established to influence health. Lack of sleep is associated with altered cortical synaptic function, GABA levels, and hippocampus function (Cirelli 2013) while inadequate sleep in adolescents is associated with a decline in neurocognitive function and in the emotional regulation and attention, specifically problem solving, verbal memory, auditory attention, visual sustained attention, psychomotor speed, and computational accuracy (Shochat et al., 2013, Fallone 2002).

Influencing Change Behavior

The intellectual pentagon could emerge as the most critical dimension to address in the BPS model because it identifies barriers to learning and change, critical for achieving whole health. The process of affecting intellectual health should be in every sense of the word, an emancipatory process (Kitchenham 2008).

Patient education and counseling are hallmarks of effective intervention in medicine. Patient adherence (DiMatteo et al., 2007), satisfaction, and outcomes are determined by an individual's health beliefs and literacy, ultimately dictating their willingness and ability to change, especially in vulnerable populations (Green et al., 2014). Low health literacy is a recognized public health problem (Kutner et al., 2006, US Department of Health and Human Services 2010) correlated with:

- increased hospitalizations (Baker et al., 2008, Baker et al., 2007),
- decreased preventive care (Scott et al., 2002, White et al., 2008),
- poorer overall health (Bennett et al., 2009),
- racial disparities in health care (Saha 2006), and
- higher mortality rates (Baker et al., 2007, Baker et al., 2008, Sudore et al., 2006, Peterson et al., 2011).

The difficulty in promoting behavior is multifaceted and can include:

- neurocognitive status of the patient and somatosensory status (Dunn 2009),
- readiness to change, self-efficacy, social support status, perceived threat of disease or severity of illness (DiMatteo et al., 2007), and
- perceived locus of control (Turiano et al., 2014).

Motivational interviewing (Abramowitz et al., 2010) techniques such as authentic and compassionate communication skills via Nonviolent Communication (Nosek 2012, Rosenburg 2003) can make communication more productive by addressing individual variations which affect communication, such as age, cognition, motivation, or psycho-emotional status, for example. Creation of mindfulness and awareness in both the provider and patient is perhaps best addressed through the lens of TLT; it allows the patient, as an adult learner, to question his or her own beliefs and frame of reference, as opposed to just accepting or learning new information without reflective discourse (Kitchenham 2008, Mezirow 2003). TLT provides a container for that liberation through allowing "transformation of problematic frames of reference – fixed assumptions or expectations – to make them more inclusive,

discriminating, open, reflective, and emotionally open to change" (Mezirow 2003, pg 58).

One entry point for fostering health behavior change is through improving provider-patient communication. Improving provider-patient communication (Green et al., 2014) through a Partnership Relationship (Garner 2014, Eisler 2007) in both general and psychotherapy medical settings has been correlated with improved pain, decreased disability, and patient satisfaction (Hall et al., 2010).

Strategies for influencing health behavior change include:
1. establishing a Partnership Relationship,
2. informing the patient about evidence-based care,
3. validating patient experience, and
4. identifying somatosensory threshold.

Table 2.1 Strategies for Influencing Health Behavior

Strategies for influencing health behavior change include:

- Rollnick et al'.,s (2008) Motivational Interviewing technique suggests following the "RULE" principle: R – Resist the urge to correct, noted as "resisting the righting reflex," U – Understand your patient's motivations, L – Listen, and finally, E – Empower with gentle, permission-based questioning. That is, posing questions in a way that asks permission of the patient and conveys respect through partnership, rather than

through an authoritarian or "provider as expert" relationship.

- Informing the patient about evidence-based care. In a trial of patients with low back pain, patient adherence, physical functioning, and outcomes improved when this facet was included (Rutten et al., 2014). Providers should be able to explain, in general terms, the scientific rationale and support for a recommended treatment, or in this case, yoga intervention.
- Increasing perceived locus of control (Turiano et al., 2014) by validating patient experience and not dismissing it as subjective or mood-oriented (Doyle et al., 2013).
- Identifying somatosensory threshold (Dunn 2009), which is described in the literature as the amount of sensory input needed for an individual to learn and function psycho-emotionally-socially (Dunn 2009). Sensory integration and processing is a concept traditionally grounded in occupational therapy; however, the interdisciplinary nature of applying the BPS model for optimal outcomes requires sensitivity to all aspects of the individual's constitution and in this case, includes sensory processing (WHO 2002, IOM 2011, The Patient Patient 2013, Garner 2001, Dunn 2009). For example, if a patient is a low threshold passive sensor, then he or she

would respond to the smallest introduction of information in the therapeutic setting. This would require a more sensitive and subtle approach than the high threshold active seeker, who naturally needs more sensory input for learning (Dunn 2009). Occupational therapist Winnie Dunn offers a model for somatosensory classification that would place the patient in one or more of the following categories (Dunn 2009):

1. High threshold active - seeker (energetic) - needs more input for learning
2. High threshold passive – bystander (quiet) – waits for others to present sensory information for learning
3. Low threshold active – avoider (fussy) – avoids sensory input and requires limited sensory information for best concentration
4. Low threshold passive – sensor (distractable) – most sensitive and a small amount of information overwhelms the individual and makes concentration difficult

These suggestions, of course, represent the ideal; however our current health care system has crumbled under the high pressures of expediency and profit. Although patient education and counseling are perhaps the most important aspects of patient-centered intervention (Miciak et al., 2012), they are services that have low or no

reimbursement rate in insurance-based health care models, especially in the United States. Hence, lack of reimbursement creates significant barriers to adequate receipt of patient education.

Quite often in medicine health care is driven through creating fear and issuing ultimatums in the name of "efficiency," expedited patient management, or to avoid legal action or threats of negligence. This is described as a dominator model relationship that is driven by pitting one profession or gender over another (Eisler 2007). Drug companies also shoulder responsibility for improving health care. Pharmaceutical marketing tactics through television and print advertising can cause individual's to request and even demand drugs and diagnostic tests from their physicians. As a result, physicians may feel like they are obligated to respond to patient demands, for fear of litigious action on the part of their patient populations.

For patients to thrive, the BPS ideal must be continuously kept in our collective vision. It is through facilitating growth in the transformative sheath or intellectual pentagon that improves education in patients and fosters a higher locus of control, both of which are undeniably linked to decreased mortality risk and improved longevity (Turiano et al., 2014). After all, if the process

does not lead to an outcome, modern "progress" is stunted and negative social and economic repercussions will be felt. Therefore, acknowledging the artistic side of medical practice has implications for quality of health care delivery (Lane 2010).

The yogic BPS model provides a template for empowerment of patients through active participation, self-reflection, and critical analysis of assumptions (Kitchenham 2008), which is a unique quality not present in other types of CAM and certainly not readily accessible in the biomedical model. Health care must recognize conservative care provides a sustainable method of seeking health instead of continuing to subscribe to invasive biomedical care that is far more costly and in cases of low back pain, yields poorer short and long-term outcomes (Mafi et al., 2013, Saltychev et al., 2014). Healthcare providers must persist in pursuit of what is best for the patient and individual, because ultimately the financial prosperity and security of a nation is determined by the health of its citizens.

Crossing the Threshold into Effective Chronic Disease Management and Health Promotion: What Medicine Needs To Thrive

There are two areas of disease prevention that are, by far, the most important modifiable lifestyle variables. Those areas are diet and lifestyle. Yoga addresses them both in the BPS model via the principle of non-violence *(ahimsa)*.

Yoga is an ancient lifestyle practice, not just one that provides physical exercise and meditation. The yogic BPS inherently embraces, due to the individual code of ethics assigned in the eight-limbed *(Astanga)* yoga practice, a non-violent lifestyle toward the self and all things (Easwaren 1985), which also includes consideration of non-violence in nutrition for all-health outcomes. Exercise will be addressed in chapters 4-10 but less often considered in yoga is nutrition.

Figure 2.4 Ashtanga Yoga: Eight Limbed Practice

This attention to non-violence is where the historic vegetarian lifestyle of yoga arises from; however, not all yoga practitioners need, or should be, vegetarian. The traditional diet of a yogi or yogini (one who practices yoga) historically was, and still is today, vegetarian. This diet was adopted as a result of yoga's philosophy that

kindness and non-violence *(ahimsa)* toward all living creatures is requisite as part of recognition of the best and healthiest self.

However, there are conditions where being a vegetarian may not always be possible or ideal. For this reason, yoga and does not require vegetarianism but instead determines a person's nutritional needs based on their individual characteristics, called a constitution. In other words, nutrition in Indian medicine, similar to the philosophy of other cultural systems of medicine such as Traditional Chinese Medicine or Native American medicine, is not addressed through a single one-size-fits-all approach as in western medicine.

Regardless, vegetarianism and its health benefits are widely embraced throughout western medicine and culture; and, science has provided us with overwhelming evidence of its health benefits. Adopting a plant-based diet can be optimal for health, but it is only part of making healthy lifestyle choices. Nutritional habits are an important and integral part of the yoga lifestyle, and can directly contribute to systemic health and outcomes. Digestion plays a critical role in the natural healing process. As far back as the ancient Greeks, the philosopher Epicurus declared "sound digestion was the basis of all human

goodness…and poor digestion was so morally destructive that everything possible should be done to avoid it."

Beyond nutrition, the other important facet of non-violence toward the self is physical activity and weight management. The three most important risk factors cited in developing persistent grades of low-level inflammation in the body include poor nutritional choices, physical inactivity, and obesity (Nathan 2008, Dean 2009). The inflammatory process caused by this trio contribute to chronic diseases and pathophysiologies such as cardiovascular disease, breast cancer, colorectal cancer, dementia, chronic lung diseases, osteoarthritis, and diabetes (Watzl 2008, Jin 2010, Serafini 2010).

Proactive behavior which prevents and reverses states of inflammation in the body depend on lifestyle choices, chiefly diet and exercise. A diet high in flavonoids can diminish the presence of pro-inflammatory gene expression (ICAM1, ILR1, TNFα, and NF-κB1) and significantly lower circulating white blood cells (Hermsdorff et al., 2010, García-Lafuente et al., 2009, Elenkov et al., 2005). Physical activity provides a strong protective anti-inflammatory effect in the body through lowering resting levels of inflammation in the body that contributes to chronic inflammatory disorders, obesity, and other chronic

noncommunicable diseases (Pedersen 2011, Brandt & Pedersen 2010, Pederson 2006, Petersen & Pedersen 2006, Mathur & Pederson 2009, Wilund 2007). In essence, skeletal muscle acts as an endocrine organ, possessing immunologic function that contributes directly to our health.

Although a full discussion of nutrition is outside the scope of discussion in this book the lack of modeling of good health habits by healthcare professionals has a detrimental impact on influencing patients. An unhealthy healthcare provider decreases the chance that he or she will promote healthy lifestyle behaviors to patients (Dean 2009).

Therefore, the importance of a healthcare professional having a personal yoga practice cannot be overemphasized. Living Your Yoga, as Judith Hanson Lasater PhD, PT, discusses in her book of the same name (2015), can directly impact our influence as healthcare providers. Healthcare providers can improve their clinical efficacy by adopting a regular yoga practice. A cumulative effect of 10 minutes of practice, three times per day, can be beneficial to exact positive systemic effects, as recommended by the WHO (2010). Focusing on nonviolence and nurturing the self and the planet is a first step toward completing the paradigm shift in healthcare from biomedical to biopsychosocial.

Experientially embracing yoga makes for better teachers and healers through improving chronic pain management and health promotion.

Defining Disability and Health Functioning Models

To make the yogic BPS model relevant, a synthesis of health functioning models via the WHO's ICF model is needed. In 2001 the WHO established what has become an internationally accepted model that guides the healthcare professional's determination of, and definition for, health due to recognition that 'the scope of health extends beyond the realm of disease to the wider domain of overall human functioning' (Scorza et al., 2013).

The ICF framework provides a container for interpretation of health, illness, function, and healthcare professional roles (WHO 2001). The ICF model has been validated by numerous studies to be effective with a wide range of patient populations including orthopaedic, neuromuscular, and psychoemotional/mental health ranging from pediatric to geriatric (Harris et al., 2005, Ayuso-Mateos et al., 2013, Conrad et al., 2012, Glocker et al., 2012, Oberhauser et al., 2013, Rudolf et al., 2012, Scorza et al., 2013).

Ancient yogis also realized the importance of "wholistic" or person-first care. The model of the obstructions *(kleshas)* could exemplify the yogic model for recognition of impairment and factors responsible for impeding or preventing health and well-being. The five obstructions *(kleshas)* recognize that an individual's life experiences can ultimately shape their health outcomes.

Kleshas	**Obstructions**
Avidya	Ignorance
Asmita	Egoism
Raga	Attachment
Dvesha	Hatred/Aversion
Abhinivesha	Clinging to the Body

Table 2.2 Obstructions to Practice

There are five obstructions. Ignorance *(avidya)*, the first obstruction, is said to give rise to the remaining four obstructions, egoism *(asmita)*, attachment *(raga)*, hatred or aversion *(dvesha)*, and clinging to life *(abhinivesah)* (Iyengar 1976). The inter-relationship of the obstructions with the WHO's ICF model can provide a cross-culturally sensitive and holistic method for addressing individuals' needs. The WHO also identifies the ICF as a BPS model because it considers environmental and personal factors as part of the 'disablement' process and health functioning. As a result, the obstructions model,

together with the five pentagons of the yogic model BPS model, are both intimately related to, and congruent with, the ICF model.

There are multiple positive variables to consider in the convergence of yoga philosophy with today's medical model. Some of those considerations include a practitioner's ability to function in a 'dynamic systems' model, one where there are multiple points of entry for intervention in medicine (rather than just the physical), seeing the patient as an active (rather than passive) participant in his/her health and healthcare, and finally, the utilization of neutral (rather than disabling) language to describe a person's health and well-being.

Overcoming obstructions to health is not the goal in yoga. Rather, being aware of, and attending to, the obstructions (ignorance, egoism, attachment, hatred or aversion, and clinging to life) and their many forms is given higher priority. B.K.S. Iyengar, in the quintessential text of early western yoga instruction, Light on Yoga, states that the obstructions can be active, latent, or hidden; they are never absent (1976). This statement supports the ICF model for provision of a deeper understanding of a disease process (or how to prevent disease and disability). The inherent wisdom of recognizing

obstacles to wellness acknowledges that if we can understand a person's likes, dislikes, fears, and loves, then we can plan more effective medical intervention.

Using yoga to facilitate health and wellness depends on more than just conceptualization of an academic model. Yoga's efficacy in medicine depends on the practitioner's ability to experience yoga, rather than just pursue scholarly study and theoretical analysis. A regular yoga practice will largely determine the effectiveness of the medical professional's clinical efficacy in patient practice. The five obstructions to practice and integration of both BPS models presented in this text (ICF and the *panca maya/koshic* model), provides an integrative template for achieving better patient outcomes, increasing patient satisfaction, and improving intervention in preventive care, health promotion, and disease management.

Determining Competence and Considering Sensory Integration

Still, there is more to the BPS model and the five obstructions than simply adopting a consistent yoga practice. How is competency determined within application of the models? Physical competency of the yoga postures and breathing techniques have been widely debated as evidenced

with the number of yoga anatomy texts currently in publication; however, physical mastery of postures will be discussed in later chapters. Primarily, what should be considered before discussing posture mastery is identification of a range of interventions based on a measure of the individual or patient's consciousness, competency, and self-efficacy. The original "Consciousness-Competency Matrix" was introduced by Mitchell and Savage in 1979 and was used to describe the four stages of skill acquisition (Folkins 1992). The four stages progress from:

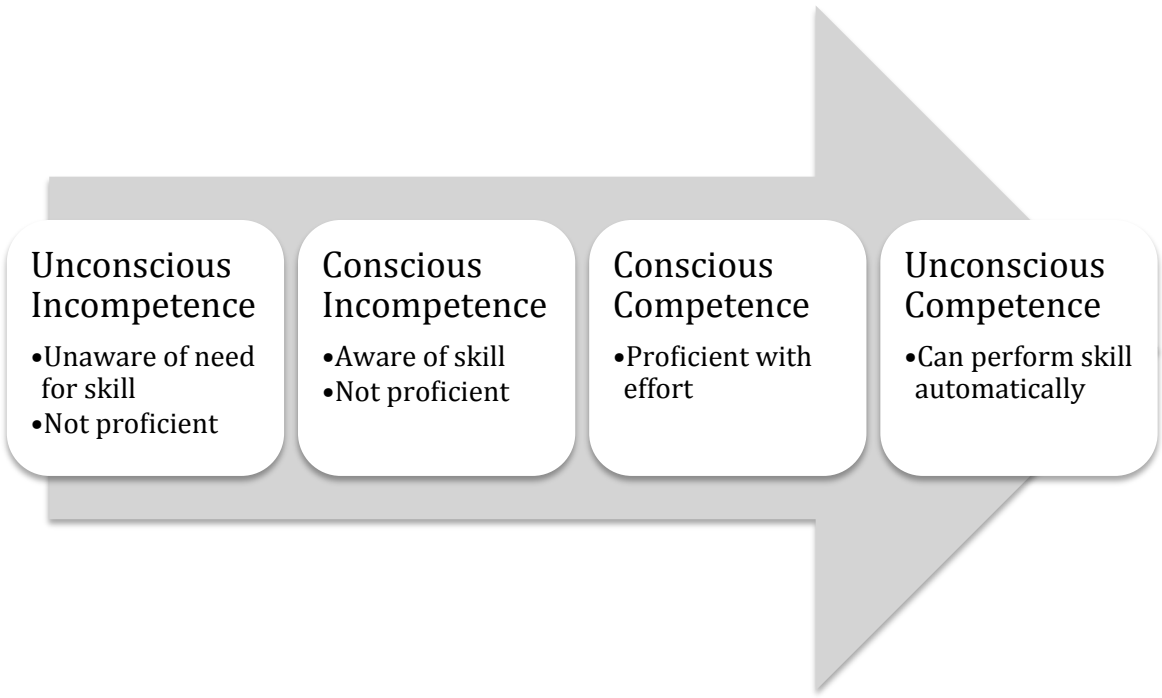


Figure 2.5 Conscious Competency Matrix

(Based on the work of Mitchell and Savage, 1979)

1) Unconscious incompetent action (you don't know that you don't know)
2) Conscious incompetent action (you know that you don't know but can assimilate the information and understand why it is important for health)
3) Conscious competent action (you know that you know)

4) Unconscious competent action (it just seems easy). Although "unconscious competency" could be misinterpreted as "thoughtless movement or action;" however, it describes a movement, behavior, or action in which the individual achieves total absorption without distraction. This has also been referred to as "second nature" or reflective ability. The matrix can be applied to teaching yoga, which underscores the importance of having a personal yoga practice. If a teacher of yoga cannot convey, with open-ended and inspirational language, the deeper potential of a yoga posture, breath, or philosophical teaching with unconscious competence, the patient is not likely to gain unconscious competence with his/her new skillset in yoga.

This can also describe Patanjali's ultimate intention for practicing yoga, "super-consciousness" or *"samadhi."* Both Eastern and Western psychology approaches recognize the importance of practice, whether dealing with physical and/or emotional blocks to health and happiness. Continuation of the explanation of competency determination with an illustrative case study follows, as well as inclusion of sensory threshold considerations based on the work of Winnie Dunn (2009), discussed earlier in the chapter.

Case Study: ICF & Obstructions Model Synergy

Disability is described in the ICF as "a difficulty in functioning at the body, person, or societal levels, in one or more life domains, as experienced by an individual with a health condition in interaction with contextual factors" (WHO 2001). See the case study (separate document "CASE STUDY" for the Capstone prospectus only) that shares Dina's* story, which illustrates the synergy between the ICF and Obstructions models.

Conditional Observations for Overcoming Obstructions

There are a number of reasons a clinician and their patients can benefit from study and application of the yogic "obstructions" *(klehsas)* philosophy model. Acknowledging that growth and transformation requires change, and that change requires acknowledgement is an important first step in dealing with barriers to health and wellness. Patient counseling and guidance toward making healthy lifestyle choices, which include the practices of yoga, requires compassionate interaction and self-awareness.

One method for facilitating personal growth is identification of intellectual preferences. For example, a small study group can be highly effective for many individuals; however, if that same small study group grew to a size of 30 or more individuals, its effectiveness may begin to diminish if participants feel uncomfortable or too vulnerable speaking in a large group setting. Alternately, one-on-one patient education may make an individual who has difficulty with social interaction very uncomfortable and less likely to follow or listen to a provider's advice. Therefore, information sessions conducted via video, handouts, or electronic/digital handouts may be best for this patient population. The Gracious Space technique developed by the Center for Ethical Leadership, which creates awareness of "a spirit and setting where the stranger can learn in public," could also be considered to facilitate a successful learning environment, as found in Hughes and Nienow's text Courageous Collaboration with Gracious Space: From Small Openings to Profound Transformation (2011). Using the technique would consider the myriad of variables for the individual that would create a comfort zone for learning, and then try to incorporate those into the intervention or session time. Considering these practices can help further shift the

paradigm of practice toward the new era of person-centered partnership-based care.

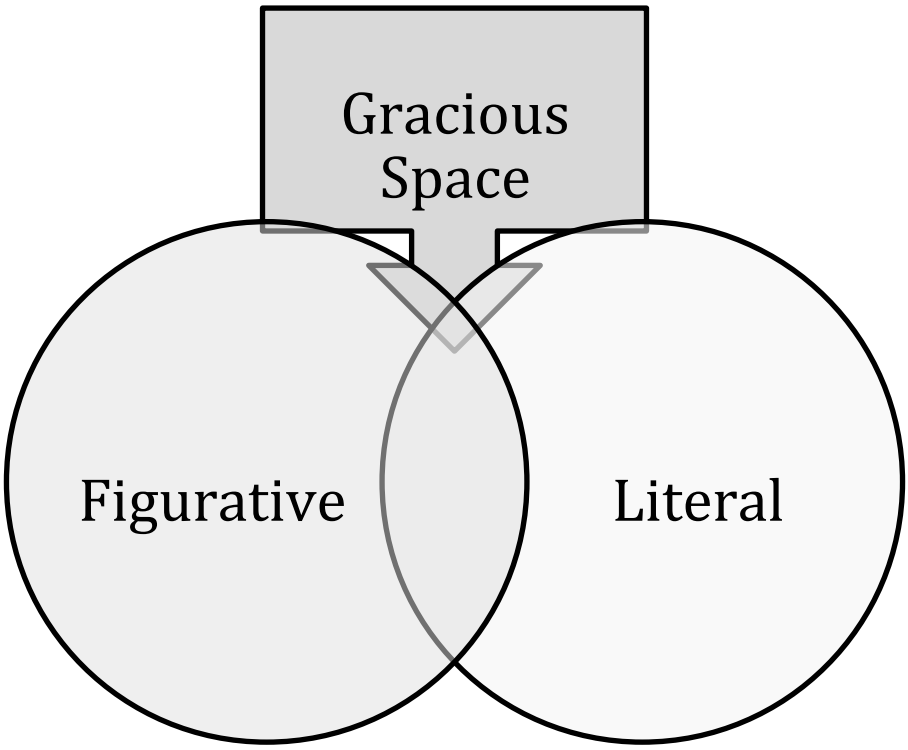


Figure 2.6 Gracious Space is found in the overlap between figurative and literal domains and is a place where a person feels comfortable learning in public.

What Doesn't Kill Us Makes Us Stronger

A second condition associated with the obstructions is the importance of recognizing that adversity, or stress, can create strength instead of illness. The health beliefs of a person views colors their view of stress. An 18.5 year

analysis of 7268 men and women who reported that "stress" have "affected their health a lot or extremely" had a 2.12 times higher risk of coronary death or myocardial infarction than those who reported no effect of stress on their health (Nabi et al., 2013). A National Health Interview Study linked to National Death Index mortality data from 1998-2006 supports that the 33.7% of adults who perceived that stress negatively affected their health or reported higher levels of stress were more likely to have worse health and mental health outcomes (Keller et al., 2012). Further, those same people also had a 43% increased risk of premature death (Keller et al., 2012). Our attitude toward stress then, has a direct impact on all health outcomes and risk of premature death. Additionally, adults who survive natural disasters, such as the 574 adults who survived the 2004 tsunami in Southeast Asia, have less likelihood of suffering from post-traumatic stress disorder and a higher reported quality of life if "they believed that life was meaningful and that they had value as a human being" (Nygaard & Heir 2012). In other words, whether or not an individual suffers from mental or physical conditions depends on their attitude toward adversity. Viewing stress and pain as a teacher or friend, instead of the enemy, can improve long-term health outcomes, health

status, and quality of life (Nabi et al., 2013, Nygaard & Heir 2012, Keller et al., 2012).

Stress reduction then, is as much of a misnomer as trying to achieve homeostasis (instead of allostasis) in the body, since, we are not trying to reduce stress or find a static homeo"stasis" in the body, we are trying to change how our body perceives it and actively adapt (allostasis) to how our mind and body responds to stress. In short, if "you are what you eat," then also "you are what you think."

Stress as "contagion" also carries great implications (Kaplan et al., 2012). The belief that stress is contagious begs to address the potential for individuals to engage in avoidance behavior, become complacent toward healthy lifestyle choices, or engage in outright self-destructive behavior. Shifting one's perspective toward constructive attitudes and coping mechanisms to address health beliefs and behaviors then, can have an impact on preventing premature aging and death (Nabi et al., 2013, Nygaard & Heir 2012, Keller et al., 2012, Kaplan et al., 2013). Yoga that is designed with sensitivity to nomenclature and attitude(s) toward stress should focus on building stress resilience, rather than stress reduction.

Review: Cultural Competence

There are three social sensitive components that influence application of the model to improve cultural competence in mindful healthcare delivery.

Culturally Sensitive Components of Care	Description
Person First Language	Identify the individual first
Person Centered Culture	Work together with the individual
Partnership Theory	Individual is an active participant in his or her health

Table 2.3 Culturally Sensitive Components of Care

1. Person First Language (Folkins, ASHA 1992) - The use of "Person First Language" identifies the individual first, rather than allowing a disability to define or precede identification of an individual. For example, in the case of diabetes, a person is not "a diabetic" but the "person with diabetes"; or, in the case of cerebral palsy, a child with cerebral palsy has a disability, rather than being labeled a "disabled child."
2. Person Centered Culture - Shift from "patient-centered" terminology to a person-centered culture. In other words, the patient-provider authoritative relationship where "doctor knows best" evolves into a person-provider

partnership where the physician or therapist works together with the individual to establish a plan of care.

3. Partnership Theory – In Partnership Theory, a person becomes an active part of his or her health care instead of a passive recipient. Relationship drives partnership theory and is recognized as moving from a domination-based interaction to a partnership (Eisler & Potter 2014). This would allow the individual to take responsibility for his or her care instead of just being a passive recipient of "doctor's orders," and would also foster creativity in rehabilitation (Garner 2014).

Improving healthcare requires an evolution of both medicine and yoga. This text offers a contribution to the international effort to create a cross-cultural system of medicine that is sensitive to other cultures and practices. The clinical implication then, is anyone can do yoga. But to practice yoga deserves careful attention. It is a subtle science that deserves respect as a part of health care and for its complexity; and as such, should require advanced study in biomedical and biopsychosocial studies.

Yoga is deserving of the constant theoretical inquiry and ongoing scientific scrutiny that all biomedical science receives. Chapters 4 and beyond establish a model for

prescribing yoga therapeutically and in wellness populations, from a biomechanical and orthopaedic viewpoint.

Healthcare providers bring a unique knowledge to the yoga paradigm of practice, while yoga educators can do the same for healthcare professionals. There is room for everyone in the practice and prescription of yoga in and as medicine so long as there is interdisciplinary research and mutual respect to advance the study of yoga as a valid, reliable, and viable method for BPS assessment and intervention.