Ancient Wisdom: Can Ayurvedic Prakruti Provide Invaluable Insights into Integrative Medicine?

Clayton Bell[1], R. Eric Heidel[2], Jean Sunega[3], Jeanne Drisko[3]

[1] University of Tennessee Medical Center (UTMC), Department of Family Medicine, Knoxville, TN 37920

[2] University of Tennessee Graduate School of Medicine, Department of Surgery, Knoxville, TN 37920

[3] University of Kansas Medical Center (KUMC), KU Integrative Medicine, Kansas City, KS 66160

Abstract

INTRODUCTION: Ayurvedic medicine utilizes constitutional prakruti (mind-body archetypes) to create patient-specific treatment plans based on physiological and psychological characteristics. Analyzing crossover between Ayurvedic prakruti and integrative medicine diagnosis is fertile ground for furthering our understanding and appreciation of how Eastern and Western medicine can merge to create the highest level of patient care possible.

OBJECTIVE: The study aims to determine if significant statistical correlations exist between Ayurvedic prakruti and self-reported integrative medicine disease diagnosis.

METHODS: Patients of the KU Integrative Medicine Clinic were invited to participate in this research study. Eligibility criteria included adult patients ages 21 and older with no language barriers and the ability to give consent. Approximately 150 participants were screened, 129 were enrolled with 119 successfully completing both the Mind-Body Survey and the Medical History Form. The Mind-Body Survey consisted of 10 self-assessment questions pertaining to specific physical and psychological characteristics. This survey was adapted from *The Chopra Center's Prakruti Patient Intake Form* and provided quantitative subscores for each Ayurvedic dosha (Vata, Pitta, Kapha). Participants were also given a Medical History Form to determine active, past, or lack of history for 47 common integrative medicine diagnoses. Biostatistical analysis included descriptive statistics for skewness and kurtosis to determine response normality. Pearson's, Biserial, and Spearman's Correlation were analyzed to determine positive and inverse correlations between prakruti and specific disease diagnosis.

RESULTS: We have found multiple statistically significant positive and inverse correlations between prakruti and self-reported medical diagnosis. Vata was associated with anxiety ($r = .22$, $p = .02$) and sleep disorders ($r = .25$, $p = .01$), whereas Kapha appeared to be protective from anxiety ($r = –.31$, $p = .001$) and sleep disorders ($r = –.19$, $p = .04$) as well as osteoporosis ($r = –.22$, $p = .02$), hyperthyroidism ($r = –.24$, $p = .01$) and environmental allergies ($r = –.19$, $p = .04$). However, Kapha was statistically associated with

obesity (r = .32, p = .001) and overweight (r = .32, p = .001), whereas Vata was protective from obesity (r = –.19, p = .05) and overweight (r = –.39, p < .001). Vata was also statistically correlated with constipation (r = .19, p = .04), depression (r = .22, p = .02), irritable bowel syndrome (r = .26, p = .01), and panic attacks (r = .29, p = .002). Vata was inversely correlated with hypertension (r = –.22, p = .02) and solid organ cancers (r = –.25, p = .01). No statistical associations were found for Pitta.

CONCLUSIONS: There does appear to be quantifiable statistically significant relationships between the Ayurvedic prakruti and self-reported history of various diseases. Our findings are consistent with classical Ayurvedic teachings regarding the doshas and their associated disease states.

Introduction

Ayurveda is derived from the Sanskrit *Ayur* (life) and *Veda* (science or knowledge), thus literally translating to "Science of Life."[1] Ayurvedic medicine is the world's oldest continuously practiced healing tradition with origins that predate written history and can be traced back 5,000 years to the subcontinent of India.[2,3] This ancient Eastern traditional medical system focuses on promoting *ojas* (health and vitality) and preventing disease through creating balance in the mind, body and environment.[4] One of the core philosophical conceptions in Ayurveda is that each person expresses a specific prakruti (mind-body constitution) comprised of energetic life forces referred to as doshas.[1] Each dosha represents distinct bioenergetic principles and physiological processes: Vata (principle of movement), Pitta (principle of transformation), and Kapha (principle of structure).[2] Each person's health is influenced by their innate proportion of these three doshas and their current state of balance or *vikruti* (disequilibrium).[3]

Although Eastern traditional medical systems such as Ayurveda may appear contrary to conventional Western medical philosophies, many parallels begin to emerge upon closer examination. Physiological and psychological processes that induce both health and disease are similarly described in both medical paradigms, albeit through different terminology and specificity of defined biomolecular pathways. Like Ayurveda, integrative medicine attempts to help the patient cultivate wellness through finding harmony and balance from a bio-psychosocial perspective. Optimization of modifiable health variables contributes to an enhanced equilibrium of the living system and thus improved symptomology. This medical paradigm is metaphorically illustrated by visualizing a gardener watering and fertilizing the roots of a tree instead of polishing the blemishes on each piece of fruit.[5]

Many of the ancient Ayurvedic treatments such as nutritional optimization, lifestyle modification, stress reduction techniques, detoxification, medications (herbs or pharmaceuticals), and a holistic, patient-centered approach are treatment modalities utilized today in integrative medicine.[4] With so much overlap it appears prudent to statistically determine if there are significant correlations between Ayurvedic prakruti and biomedical diagnosis. Traditional Ayurvedic teachings have described various disease predispositions for each dosha.[4] Recent studies have found significant relationships between cardiovascular risk factors (diabetes, hypertension, dyslipidemia), insulin resistance, and inflammatory markers in patients with strong Kapha disposition.[6] Ongoing research to describe trends among Ayurvedic doshas in terms of specific biomarkers is also underway. Immunophenotyping differences between the three doshas found significantly increased levels of white blood cells in Kapha dominant individuals.[7] Biochemical profiles including liver function tests, lipid profiles, and hematological parameters such as hemoglobin have also been found to exhibit differences between prakruti.[8]

Our study aims to contribute to this ever-expanding body of literature by assessing for correlations between Ayurvedic prakruti and active diagnosis. If we discover positive or inverse correlations, we may gain invaluable insights into our patients in a time- and cost-efficient manner. Knowing the diseases a patient is prone to, or protected from, on the basis of their Ayurvedic prakruti will help custom-tailor our interviews, testing, and treatment interventions. This will be especially beneficial for patients who are unable to undergo cost-prohibitive, specialized diagnostic testing. Rising healthcare costs and the increasing patient demand for integrative medicine services make low cost diagnostic and treatment techniques of paramount importance.[9,10]

Methods

Participants in this pilot study were patients of the University of Kansas Integrative Medicine Clinic. Invitation to participate in the study was on a voluntary basis and eligibility criteria included adult patients ages 21 and older with no language barriers and the ability to give consent. Each participant was asked to read a Survey Consent before enrolling in the study. The study was approved by the University of Kansas Medical Center Institutional Review Board.

To determine the participant's dominant prakruti, a ten-question paper Mind-Body Survey was administered to each study participant (see Table 1). Each response on the Mind-Body Survey corresponded to a specific physiological or psychological characteristic of the three doshas (Vata, Pitta, Kapha). To prevent selection bias the survey responses for each characteristic were randomly distributed amongst the three answer columns. A Mind-Body Survey Key was generated to associate each patient response with its corresponding dosha characteristic. The sum total of categorical subscores from the keyed Mind-Body Survey was used to determine the quantitative composition of each patient's dominant prakruti and dosha (Vata, Pitta, Kapha). The Mind-Body Survey is adapted from the *The Chopra Center's Prakruti Patient Intake Form* and is being used with their permission. This medical evaluation form is utilized by the Chopra Center's Ayurvedic practitioners to aid in diagnosis and the creation of personalized wellness plans for each patient.[11]

For each prakruti characteristic, participants were instructed to choose the statement that: "Most accurately represents me," "Secondarily represents me," and "Rarely represents me." Our study survey blinded the participants from knowing which characteristics were associated with each dosha and utilized random distribution of choices in each category to prevent bias.

Table 1. Prakruti Mind-Body Survey

#	Characteristic	Vata	Pitta	Kapha
1	Frame	I am thin, lanky, and slender with prominent joints and thin muscles.	I have a medium, symmetrical build with good muscle development.	I have a large, round, or stocky build. My frame is broad, stout, or thick.
2	Weight	Low; I may forget to eat or have a tendency to lose weight.	Moderate; it is easy for me to gain or lose weight if I put my mind on it.	Heavy; I gain weight easily and have difficulty losing it.
3	Eyes	My eyes are small and attractive.	I have a penetrating gaze.	I have large pleasant eyes.
4	Complexion	My skin is dry, rough, or thin.	My skin is warm, reddish in color, and prone to irritation.	My skin is thick, moist, and smooth.
5	Hair	My hair is dry, brittle, or frizzy.	My hair is fine with a tendency towards early thinning or graying.	I have abundant, thick, oily hair.
6	Joints	My joints are thin and prominent and have a tendency to crack.	My joints are loose and flexible.	My joints are large, well-knit, and padded.
7	Sleep	I am a light sleeper with a tendency to awaken easily.	I am a moderately sound sleeper, usually needing less than eight hours to feel rested.	My sleep is deep and long. I tend to awaken slowly in the morning.
8	Under Stress	I become anxious and/or worried.	I become irritable and/or aggressive.	I become withdrawn and/or reclusive.
9	Body Temp	My hands and feet are usually cold and I prefer warm environments.	I am usually warm regardless of the season, and prefer cooler environments.	I am adaptable to most temperatures but do not like cold, wet days.
10	Temperament	I am lively and enthusiastic by nature. I like to change.	I am purposeful and intense. I like to convince.	I am easy going and accepting. I like to support.

A Medical History Form was completed by each patient as well. This form listed 47 commonly diagnosed medical conditions and asked the patient to mark if they had ever been diagnosed with or currently suffer from each condition. Approximately 150 participants were screened and 129 patients took part in the study; however, ten of those surveys were excluded from statistical analysis due to lack of completion. Our survey response rate was strong with 92.2% (119 of the 129) of participants adequately completing both their Mind-Body Survey and Medical History Form.

To ensure patient confidentially and HIPPA Compliance, all Patient Surveys and Medical History Forms were collected and stored in a locked secure area, and accessed only by study personnel. Each set of patient forms (survey and medical history) were assigned an anonymous identification number and no personal identification information was collected. Each de-identified data set was entered into a Microsoft Excel database on a KU Medical Center secured computer. The de-identified Excel database was then securely transmitted to an independent biostatistician for advanced quantitative analysis.

Skewness and kurtosis statistics were run on all distributions to test the assumption of normality. Any skewness or kurtosis statistic above an absolute value of 2.0 was assumed non-normal. Non-parametric correlation tests were used for non-normal variables. When two non-normal continuous variables were correlated, a Spearman correlation was utilized as a measure of association. When a non-normal continuous variable and a normal continuous variable were correlated, a bi-serial correlation was used. Finally, when both variables were normally distributed continuous variables, Pearson's r correlation was employed. Statistical significance was assumed at an alpha value of .05, unless Bonferroni-corrected alpha values were used for testing multiple hypotheses concurrently. All analyses were conducted using SPSS Version 22 (Armonk, NY: IBM Corp.).

Results

We discovered multiple statistically significant positive and inverse correlations between Ayurvedic prakruti and self-reported medical diagnoses. Many of these statistically significant discoveries are consistent with ancient Ayurvedic teachings. Furthermore, several medical diagnoses had contradictory associations with Vata- and Kapha-dominant mind-body archetypes, which is consistent with inherently contrasting qualities of Vata and Kapha.

Kapha was statistically associated with obesity (r = .32, p = .001) and overweight (r = .32, p = .001), whereas Vata was protective from obesity (r = –.19, p = .05) and overweight (r = –.39, p < .001) (Table 2). These findings are consistent with traditional Ayurvedic teachings regarding body composition attributes of Kapha and Vata mind-body archetypes.[4,11] In contrast, Vata was associated with anxiety (r = .22, p = .02) and sleep disorders (r = .25, p = .01), whereas Kapha appeared to be protective from anxiety (r = –.31, p = .001) and sleep disorders (r = –.19, p = .04) (Table 2). These findings are also consistent with the accepted Ayurvedic qualities related to each respective dosha.[4] In addition to anxiety and sleep disorders, Vata was also statistically correlated with constipation (r = .19, p = .04), depression (r = .22, p = .02), irritable bowel syndrome (r = .26, p = .01), and panic attacks (r = .29, p = .002). However, Vata was inversely correlated with hypertension (r = –.22, p = .02) and solid organ cancers (r = –.25, p = .01). Study participants with dominant *Kapha* mind-body archetypes were also found to have a decreased disposition to osteoporosis (r = –.22, p = .02), hyperthyroidism (r = –.24, p = .01), and environmental allergies (r = –.19, p = .04) (Table 2). No statistical associations were found for *Pitta*.

Discussion

Our pilot study regarding Ayurvedic prakruti and western medical diseases revealed numerous insightful correlations. Anecdotal Ayurvedic wisdom dating back thousands of years was scientifically validated according to our biostatistical analysis of Vata and Kapha mind-body archetypes.

In Ayurveda, Vata is said to possess the quality of lightness which would protect those with a strong Vata constitution from becoming overweight or obese.[4] We discovered objective statistical evidence of that presumed premise with Vata being protective from obesity (r = –.19, p = .05) and overweight (r = –.39, p < .001). On the contrary, Kapha was statistically associated with obesity (r = .32, p = .001) and overweight (r = .32, p = .001). Kapha is said to retain the qualities of heaviness and denseness and is the dosha

Table 2. Prakruti Correlations with Western Medical Diseases

		Vata	Kapha
Allergies: Environmental	Pearson Correlation	.123	–.192*
	Sig. (2-tailed)	.194	.040
	N	114	114
Anxiety	Pearson Correlation	.217*	–.305**
	Sig. (2-tailed)	.021	.001
	N	114	114
Constipation	Pearson Correlation	.192*	–.010
	Sig. (2-tailed)	.039	.918
	N	116	116
Depression	Pearson Correlation	.215*	–.115
	Sig. (2-tailed)	.020	.216
	N	117	117
Hypertension	Pearson Correlation	–.224*	–.020
	Sig. (2-tailed)	.018	.831
	N	112	112
Irritable Bowel Syndrome	Pearson Correlation	.262**	–.102
	Sig. (2-tailed)	.005	.284
	N	112	112
Obesity	Pearson Correlation	–.186*	.317**
	Sig. (2-tailed)	.052	.001
	N	110	110
Overweight	Pearson Correlation	–.387**	.317**
	Sig. (2-tailed)	.000	.001
	N	107	107
Osteoporosis	Pearson Correlation	–.029	–.221*
	Sig. (2-tailed)	.758	.018
	N	113	113
Panic Attacks	Pearson Correlation	.288**	–.144
	Sig. (2-tailed)	.002	.129
	N	113	113
Sleep Disorder	Pearson Correlation	.246**	–.188*
	Sig. (2-tailed)	.008	.044
	N	115	115
Cancer: Solid Organ Tumors	Pearson Correlation	–.250**	–.098
	Sig. (2-tailed)	.006	.290
	N	118	118
Hyperthyroidism	Pearson Correlation	.088	–.242*
	Sig. (2-tailed)	.372	.013
	N	105	105

* Correlations are significant at the 0.05 level (2-tailed).
** Correlations are significant at the 0.01 level (2-tailed).

responsible for structure.[4] An overabundance of structural accumulation could manifest as excess physical tissue and predispose those individuals with a strong Kapha disposition to becoming overweight or obese. Two of the ten Mind-Body Survey questions gauged participants' subjective self-assessment of body weight and frame size (Table 1, Questions 1 and 2). Thus, perceived body physique played a significant contributory role in the overall prakruti score of each participant. Furthermore, it should not be surprising that we discovered statistical correlations with Vata and Kapha in regards to obesity and overweight since these attributes were inherently present as selection choices within the survey instrument itself.

Vata was associated with anxiety (r = .22, p = .02) and sleep disorders (r = .25, p = .01), whereas Kapha appeared to be protective from anxiety (r = –.31, p = .001) and sleep disorders (r = –.19, p = .04). Our Mind-Body Survey instrument specifically asked participants to evaluate their reaction to stress (i.e. anxiety) as well as their sleep pattern (see Table 1, Questions 7 and 8). This potential self-selection of characteristic traits so intricately bound to the correlated disease states (anxiety and sleep disorders) is an inherent bias and shortcoming of our study. Regardless, these findings are consistent with Ayurvedic teachings pertaining to prakruti sleep and stress patterns. Kapha possesses inherent qualities of stability, steadiness, and slowness, which may predispose those with strong Kapha dispositions to longer, more sound sleep patterns and provide enhanced psychological stress capacity. Innate qualities of Vata include irregularity, mobility, quickness, lightness, and expansiveness. Furthermore, Vata is responsible for movement throughout the body (circulation, respiration, peristalsis, neural synapses, etc.).[4] Vata- related *vikruti* may increase *Udana Vata* (Vata subdosha responsible for upward flow of energy) and predispose the individual to experiencing a perceptual state of "monkey mind" and increased stress-related, psychoneuroendocrine-related physiologic changes. A pathognomonic sign of Vata derangement is chronic *anidra* (insomnia).[12] In chronic insomnia, the activity of both limbs of the stress system (HPA axis and the sympathetic system) are positively related to the degree of objective sleep disturbance.[13] This physiologic mechanism may help explain why

those with strong Vata constitutions appear to have higher sensitivity to stress-related illnesses.[4,12]

In addition to anxiety and insomnia, our findings also revealed positive correlations between Vata mind-body types and constipation, irritable bowel syndrome, panic attacks, and depression. Traditional Eastern healing traditions such as Ayurveda and traditional Chinese medicine have long appreciated the mind-body connection. Western medicine is now scientifically validating these ancient medical paradigms. Our current understanding is that the gut's ENS (Enteric Nervous System) and our brain are highly integrated and constantly communicate in a bidirectional fashion largely through the ANS (Autonomic Nervous System) and HPA (Hypothalamic-Pituitary-Adrenal) axis. Within the CNS (Central Nervous System), the limbic system acts as the locus of gut control as well as a major contributor to the emotional and psychological status of the individual.[14] Perhaps this psycho-neuroanatomical relationship can help explain why those with strong Vata constitutions experienced increased frequency of gastrointestinal disorders such as constipation ($r = .19$, $p = .04$) and irritable bowel syndrome ($r = .26$, $p = .01$). Study participants with amplified Vata compositions also had significantly more panic attacks ($r = .29$, $p = .002$) and depression ($r = .22$, $p = .02$). These findings further reinforce Ayurvedic teachings regarding Vata's psychological susceptibility to stress-related disorders.[4,12]

Protective relationships also appear between prakruti and various medical diagnoses. Our findings revealed that Kapha was protective against osteoporosis ($r = –.22$, $p = .02$). Multiple studies have demonstrated obesity (a Kapha-associated condition) to be protective from osteoporosis as well.[15] Ayurvedic teachings, scientific literature, and our study all draw similar parallels between obesity, Kapha, and osteoporosis, thus further reinforcing the validity of our results. Hyperthyroidism was also less prevalent in those with high Kapha constitutions ($r = –.24$, $p = .01$). Kapha possesses a quality of slowness which is antagonistic to the rapid heart rate and increased metabolism associated with hyperthyroidism.[4,16] Symptoms of hyperthyroidism also include weight loss and anxiety; Kapha was found to be protective for both these conditions in our study. Kapha also had lower incidence of environmental allergies ($r = –.19$, $p = .04$). Immunological phenotyping has revealed significant differences amongst the doshas with elevated CD25 (activated B cells) and CD56 (NK cells) in Kapha-dominant study subjects. This may reveal why Kapha-dominant individuals have enhanced ability to elicit better immune responses.[7] Collectively, these findings would be consistent with the Ayurvedic knowledge that individuals with Kapha dosha dominance have more robust immune systems.[4]

Vata was found to be protective from several additional medical diagnoses as well. Vata was inversely correlated with hypertension ($r = –.22$, $p = .02$). This finding is surprising considering the medically accepted phenomenon that stress can cause hypertension through repeated blood pressure elevations as well as by stimulation of the nervous system to produce large amounts of vasoconstricting hormones such as cortisol, norepinephrine, and epinephrine.[17] Stress has not yet been proven to directly cause chronic hypertension and perhaps Vata's strong protection against becoming overweight or obese (both of which are known to contribute to chronic hypertension[18]) offsets the risks associated with transient blood pressure spikes. Another theory is that people often do not cognitively realize when they are experiencing stress-related transient hypertension and thus did not mark this condition on their Medical History Form.

Solid organ cancers ($r = –.25$, $p = .01$) were also inversely correlated with Vata mind-body type. In Ayurveda, the development and spread of cancer involves all three doshas. Pitta is responsible for the conversion of the tissue from normal to malignant, Kapha is responsible for tumor growth, and Vata is responsible for metastasis.[2] Our study did not take tumor staging into account. Previous studies have found a correlation between Pitta mind-body types and increased incidence of cancer.[19] In our study, we did not find a statistical association between Pitta and cancer incidence. Further studies with larger numbers of participants should be performed to further investigate the potential links between prakruti and risks for cancer development.

Prakruti correlation with various self-reported disease diagnoses were determined through Pearson's, bi-serial, and Spearman's Correlation as

aforementioned. This allowed us to directly link prakruti statistical composition with specific illnesses. Classifying each individual participant upon their more common two dosha prakruti would be an interesting avenue of future investigation.

One potential shortcoming in our study was that we did not find any significant disease correlations with regards to Pitta-dominant prakruti. Ayurveda traditionally teaches that Pitta is associated with "Fire" and "Heat"-related illnesses such as inflammation, ulcers, gastroesophageal reflux (GERD), and skin irritations.[4] Perhaps our lack of Pitta-associated illnesses were due to a statistically underpowered study. Participant selection bias on the Mind-Body Survey may have also contributed. Participants may have preferred to perceive and describe themselves as having a "medium, symmetrical build" with "moderate weight" as opposed to being "thin, lanky, and slender" or "large and round" with "heavy weight." Furthermore, most Pitta characteristics on the Mind-Body Survey were intermediate choices between Vata and Kapha. Future prakruti survey instruments should utilize more Pitta-specific characteristics. This combination of variables may have contributed to a more nebulous pool of Pitta archetype respondents. Perhaps this potential selection bias is related to our significant outlier effect revealed by Pitta kurtosis equal to 2.2. Spearman's Correlation was used to accommodate for the non-normal continuous distribution of Pitta responses, yet still no significant associations were found.

For future studies, a standardized prakruti assessment tool such as the *Sushrutha Prakriti Inventory (SPI)* should be considered. The SPI has been validated; however, its 90 objective questions and 60 subjective questions requires a substantial time investment on behalf of the study participant.[20] Although our Prakruti Mind-Body Survey had several research related limitations as outlined above, *The Chopra Center's Prakruti Patient Intake Form* continues to be a valuable clinically-oriented asset.[11] For research purposes, an expanded Prakruti Mind-Body Survey could be formulated from our current Mind-Body Survey instrument. Additional physical and psychological characteristics could be determined to further strengthen our prakruti classifications as well as offset the inherent weighted value of specific disease-associated characteristics such as frame, weight, sleep patterns, and stress response. Generating more Pitta-specific descriptions would likely allow us to better quantify potential correlations between Pitta and various disease states as well.

Our study utilized a paper formatted Mind-Body Survey and Medical History Form. The research surveys were given to volunteer participants as they were awaiting their medical appointments and the documents were retrieved upon completion. This distribution format likely contributed to our impressive 92% survey response rate, but also had several shortcomings. The paper format allowed participants to leave blanks or answer questions incorrectly. These response inconsistencies decrease the precision of our biostatistical analysis and subsequent clinically pertinent findings. Another potential problematic issue arises during survey scoring and manual data entry. All responses were hand scored and reviewed twice for improved accuracy. Nevertheless, the possibility for human error is always present when scoring keyed responses and transferring data from a written survey to an Excel database. Creating an online survey utilizing SAS or SPSS software would ensure all survey responses were answered correctly and ensure participant responses automatically propagate into an electronic database. Email-mediated surveys would likely have a lower response rate, which should be considered when designing future studies.

Our study aim was to determine if correlations do in fact exist between Ayurvedic prakruti (mind-body types) and various diseases; our results revealed 17 statistically significant associations between Ayurvedic archetypes and modern medical diagnosis. All participants in the study were patients of the KU Integrative Medicine Clinic. Diversifying our survey distribution to multiple academic institutions around the country would help to capture a more representative heterogeneous sample. Increasing our study participation from 119 to several thousand participants would help further diversify our respondent base and build upon our current pilot study discoveries. Additional investigation should be undertaken to verify and further elucidate the connection between Ayurvedic prakruti and the propensity to various ailments. If validated, incorporation of these Ayurvedic concepts into mainstream Integrative Medicine and the current western medical paradigm may provide us with

invaluable insights which can be utilized for personalized disease prevention and health promotion.

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Clayton Bell, M.D., is an Integrative Medicine physician and Family Medicine Clinical Assistant Professor at the University of Tennessee Medical Center. Dr. Bell specializes in integrative medicine and integrative oncology consultations where he merges orthomolecular functional medicine and psychoneuroimmunoendocrinology with ancient Ayurvedic wisdom to create personalized wellness plans for each patient. Dr. Bell completed an Integrative Medicine Fellowship at University of Kansas Medical Center and his Family Medicine residency at Central Maine Medical Center. After medical school at UAMS in Little Rock, Arkansas, Dr. Bell joined the international relief organization Humanity First and lived in Haiti for two years. While in Haiti, he co-created the Cloud Forest Medical Clinic and built the Bon Samaritan Primary School which is currently educating over 200 children.