

UPLEVELING HUMANITY

THE INSTITUTE FOR ALIVENESS JOURNAL | ISSUE 1 | WINTER 2021

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MUSCLES & FASTING

Men and women alike...
Is the fear of muscle loss
stopping you from fasting?
Truth behind fasting and
muscle gain.

FECAL TRANSPLANT

Someone else's poo injected
into your guts? No way!
Yes, way. Read here to learn
about active research and
mind-blowing results!

URINE THERAPY

How to get in touch with
your own inner medicine: go
beyond the taboo and heal
yourself internally and
externally.

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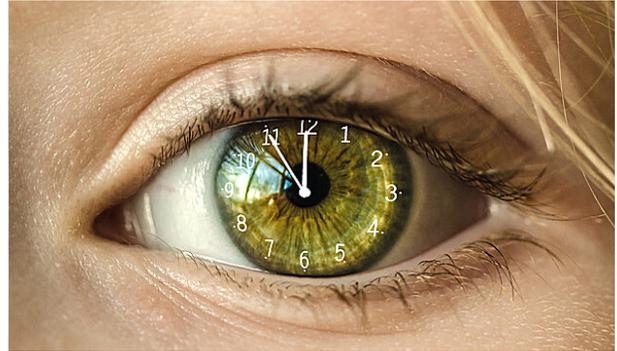
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THE INSTITUTE FOR ALIVENESS

U P L E V E L I N G H U M A N I T Y

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THE ORIGIN STORY

TIFA arose out of moral imperative. When Andi left her public-facing career in health, there was no one out there doing the full-spectrum work of awakening. It's not just about a healthy diet or the right mindset. The science of applied epigenetics and art of transformation are skills honed in through escalated self awareness. That is the aim of TIFA: Unleveling Humanity. The Institute trains practitioners from around the world in an 18-month certification program including never-before-taught, interdisciplinary subject matter. TIFA also sponsors one-week online fasting retreats @THE INITIATION. Students who are already excelling on a personal level find a global collective to ground their continued self-development. It can be lonely at the top, but not when you're a part of TIFA. Students go on to co-found organizations and make global impact in ways otherwise possible. This collective is a network many dream of. We truly understand the power of a container to do deep work and hold one another accountable in the process of becoming.

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TIFA active in 26 countries

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Long Term Fasting

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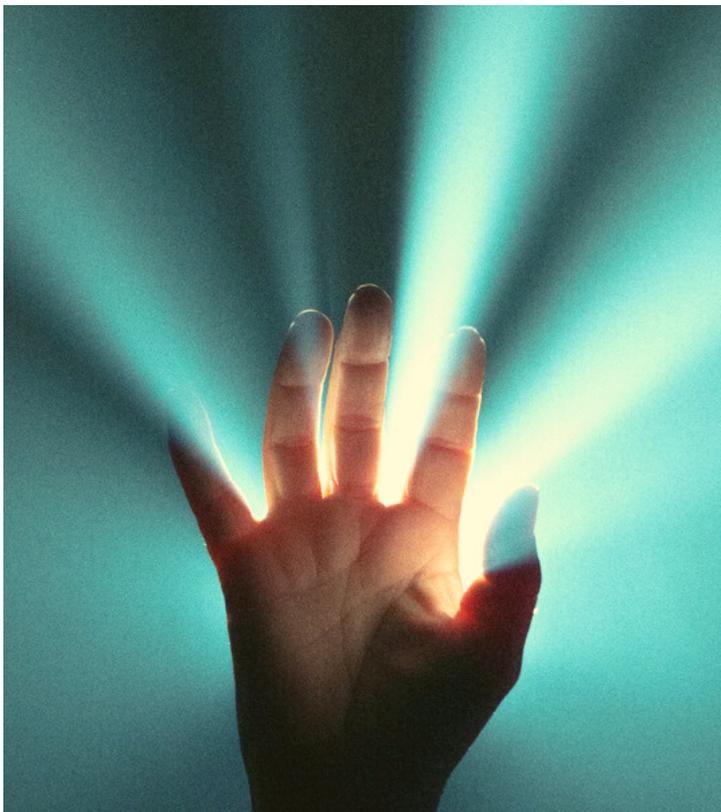
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FROM THE EDITOR



Here we sit at the precipice of the rest of human history. 2020 has been the most astrologically significant year of anyone alive today's life. Breathe that in. **The events of this year,** undeniably unforeseen, **will fester in our psyches for decades** to come. Humanity has walked up to a cliff side... and jumped. Nothing we've ever known about ourselves as a species will ever be the same. Life is... speeding up. **Increasing in velocity and stakes** at a rate faster than any of us could endure individually. The Gestalt principal of the whole's experience and outcome far surpassing the subjective is the clay we mold at The Institute For Aliveness. As this Institute has birthed itself into being and **the right people have been magnetized into orbit,** we set forth with one clear mission: **to hold higher standards for our species.** "Upleveling humanity," as we say. The students have dived in head first this year into profound change, what many acknowledge as **10+ years of personal growth in just 12 months.** We've seen that it is the experience itself which has created the change. **"It's not the curriculum that's the course; it's the journey that's the course."** Intense. This pressure cooker for profound transformation is an **undeniable straight-shot to facing oneself.** Looking into the buried parts of ourselves we'd rather not unsettle. Dusting up mud, packed down deep, which can create humus and **mold our mind.** So we attend to ourselves, our psyches, our souls. **The three main semesters of TIFA empower the individual to decipher, separate and dissect the different elements of healing and being human.**

From **Applied Epigenetics,** the Microbiome and lifestyle design to **herbal therapeutics,** diagnostics, digestion and detoxification, the BODY semester is what you might expect from me. MIND is where we find out what BODY lacks. Rooted in **deep study of neurobiology,** we stem into **trauma and psychosomatics.** We clarify the lenses we look through to filter our world. We twist our tongue into compassionate communication techniques and **untie cognitive dissonance.** As we glide into our third semester: SPIRIT, the interconnection of all life's elements becomes apparent. We grace into the unseen, face the **laws of karma and dharma,** slide into symbolism and look deeply at relationships. Finishing up the year with **bioenergetics,** sex and Tantra, we **leave no stone unturned.** Each student is heading into their second year of TIFA a completely different being. **Physically and psychologically upgraded,** polished to a new level of excellence. This newfound resiliency will ease them through the final six months of the course, writing their final thesis and undergoing a rigorous apprenticeship with an elder who has 40+ years of experience in their art. As our in-person retreats for 2020 were postponed due to the global travel block, we will have a giant retreat for the first two graduating classes in June/July 2020. This transformational Institute is gaining traction and snowballing in influence upon the world. **The only question is - will you join us...?**

Candrea Daige
EDITOR IN CHIEF

WHY DOESN'T FASTING BURN MUSCLE?

BY
PATRICK LOEUIS

FASTING IS A VOLUNTARY ABSTENTION FROM EATING. IT IS PRACTICED FOR PHYSICAL, MENTAL, SPIRITUAL, OR OTHER REASONS. MILLIONS OF HUMAN BEINGS HAVE FASTED FOR THOUSANDS OF YEARS OR MORE. IT IS NOT STARVATION, NOR INVOLUNTARY ABSTENTION OF FOOD UPON DROUGHT OR FAMINE. IT IS A CHOSEN PRACTICE TO CLEANSE FOR HEALTH.

When fasting, food is still readily available, but the practitioner consciously chooses to abstain from eating solid food for a specific intention or reason. Fasting can commence at any time and be ended at will for whatever reason. Fasting may be done for any length of time (J Fung 39). Shorter-term fasting can also be done for a matter of hours. A type of fasting known as "intermittent fasting", lasts for 14-22 hours. Fasting for a matter of days is called extended or long-term fasting. The practice of fasting is honored by all of the major faith traditions from Christianity to Islam, which both subscribe to an entire month/season of fasting known as Lent or Ramadan, to the antiquity of Ancient Greece and the medical pioneer Hippocrates.

Despite its prevalence in human history, therapeutic fasting has largely been forgotten about in the modern world, and it can be seen as something quite secretive. There is little written about fasting, very few books, articles, and even research available today (J Fung 40). As a result, myths and misunderstandings about the practice have developed, and they merit debunking in order to fully understand the power of fasting, physically, mentally, and spiritually for humans today.

One of the myths is that fasting burns muscle. Thus, it is not a practice to be engaged in by athletes or fitness-minded people intending to build, grow, and develop a healthy muscular physique. Even though scientific research on fasting is limited, there is indeed enough research available to debunk this myth. You may ask: Why exactly is "fasting burns muscle" a myth? Well, the bodily processes during fasting do just the opposite! Don't believe me? Read on. (Or better yet, experiment on yourself!)

The processes that occur in the body while fasting conserve and protect current muscle mass and even help promote future muscle growth and development. Before the link between fasting and muscle health is directly addressed, we must first examine the factors that promote muscle development and growth in the first place.

Muscle gain or loss is primarily a function of exercise. It is not even so much the result of consumption, to include both food and supplements, either. The building of muscle comes down to a simple process known as hypertrophy. Hypertrophy is an increase and growth of muscle cells, that refers to an increase in muscular size achieved through exercise.

The two types of muscular hypertrophy are myofibrillar and sarcoplasmic. Myofibrillar increases strength and speed by activating contractor muscles, and sarcoplasmic increases energy storage and endurance by activating glycogen storage in muscles. In order to achieve either of these states, muscles must have both mechanical damage and metabolic fatigue. When one lifts a heavyweight, for example, the contractile proteins in the muscles must generate force to overturn the resistance provided by the weight. This action results in structural damage to the muscles. This mechanical damage to muscle proteins stimulates a repair response in the body. The damaged fibers in muscle protein result in increased muscle size. Mechanical fatigue occurs when the muscle fibers exhaust the available supply of ATP, adenosine triphosphate, an energy component that helps your muscles contract. When this component runs out, muscles run out of fuel to contract and lift the weight properly. This fatigue stimulates muscles to gain as well (J Chertoff). The opposite of hypertrophy is atrophy, which is the wasting or loss of muscle tissue.

There are three types of muscle atrophy: physiologic, pathologic, and neurogenic muscle atrophy. Pathologic atrophy is the result of aging, starvation (as noted already - not the same as fasting), and disease. Neurogenic atrophy is the result of injury or disease of nervous tissue that connects to muscle tissue.

The most common form of atrophy, physiologic, is caused by simply not using the muscles enough (Medline Plus). To summarize, if one wants to build and strengthen their muscles, one should exercise more perhaps by performing compound weight-bearing moves such as the squat, deadlift, overhead press, or bench press.

While exercise is key to healthy, strong muscles, hormonal factors are an important factor as well. Two hormones of importance to discuss here is growth hormone and testosterone. First, growth hormone is a peptide hormone produced and secreted mainly by the pituitary gland. Various stimuli affect the frequency and magnitude of growth hormone production and secretion: gender, age, sleep, diet, and exercise, and growth hormone levels vary greatly throughout the day. Growth hormone has direct effects on most tissues including skeletal muscle.

Growth hormone accomplishes this by inducing the synthesis of insulin-like growth factor I (IGF-I) in two key tissue groups: liver tissue and muscle tissue. IGF-1 synthesized in the muscle (mIGF-I) in response to exercise or growth hormone acts in an autocrine/paracrine way to stimulate hypertrophy.

Furthermore, studies have shown that while there is no evidence to suggest that growth hormone is a better way to stimulate IGF-1 in muscles than exercise, studies have shown that deficiency in growth hormone does result in a reduction of muscle mass in humans (C.P. Velloso). This suggests that growth hormone is critical at least in the maintenance, and preservation of the muscle mass developed from exercise. Second, testosterone is a steroid hormone of the androgen group. It plays a vital role in protein synthesis and is produced by the reproductive organs. Testosterone plays a key role in the development of male reproductive tissues.

WIt also promotes secondary characteristics such as muscle growth, bone mass, and growth of body hairs. In general, androgens promote protein synthesis.

Testosterone has both androgenic and anabolic effects. The androgenic effect includes maturation of sex organs, growth of beads and other body hairs, and deepening of the voice. Anabolic effects of testosterone include growth in muscle mass and strength, increased bone density, and stimulation of linear growth (R.C. Griggs). his has been verified by several studies.

One study was able to conclude that supraphysiological doses of testosterone increase fat-free mass, muscle size, and strength in normal men (S Bhasin).

Now that the two key factors in muscle development and growth have been determined, the link between these factors and fasting can now be established. To start, a high-level overview of what occurs in the human body when someone is fasting needs to be illustrated.

As one starts fasting, the body increases carbohydrate oxidation. This means that the body is burning sugar, in the form of glycogen, for the first twenty-four to forty-eight hours after you stop eating until the body runs out of glycogen. When there is no more sugar to burn, the body switches to burning fat. Fat oxidation increases as carbohydrate oxidation decrease toward zero. At the same time, protein oxidation, burning protein for fuel, decreases.

The normal protein breakdown of about seventy-five grams per day falls to fifteen to twenty grams per day during fasting. Much of the amino acids that are broken down during regular turnover of cells are reabsorbed into new protein (M.D. McCue). This is verified by a study that showed on day seventy of an alternate-day fasting regimen, fat-free body mass was the same as day one fat-free body mass (S. Bhutani). Rather than burning muscle during fasting, the body conserved muscle in these studies. This is one knock on the myth that "fasting burns muscle".

In terms of exercise ability or capacity, there is evidence that suggests no decrease in the body's exercise capacity in a fasted state. This is because fasting boosts the body's metabolism even as the fuel source changes from carbohydrates to fat. Two studies support this. In one study, where subjects fasted every other day for twenty-two days results showed there was no measurable decrease in BMR, basal metabolic rate, meaning no starvation mode. What occurred in this study was that fat oxidation or burning, increased 58% from sixty-four grams per day to one-hundred grams per day. Carbohydrate oxidation decreased by 53% from one-hundred and seventy-five grams per day to eighty-one grams per day. This means that the bodies in the study switched from burning sugar to burning fat with no overall drop in energy (J Fung 74).

In the second study, subjects fasted continually over four days. In this study, BMR increased by twelve percent on day four from day one, and exercise capacity increased 15% on day four from day one (C. Zauner). Lastly, a 2011 study was conducted that compared the physical training results of subjects training in the fasted state versus the fed state. Twenty young men participated in a six-week endurance training program. Ten trained fasted, and ten trained while fed, mainly on carbohydrates. This study concluded that training in the fasted state stimulated the contribution of fat to energy provision and increased muscular oxidative capacity more than those training on carbohydrates.

In addition, training in the fasted state prevented a drop of blood glucose concentration during fasted exercise. This study showed that fasted training can stimulate physiological adaptations in muscles that may contribute to improved endurance exercise performance (K.V. Proeyen).

These two studies suggest that testosterone levels are positively impacted during the shorter duration of fasting as opposed to longer duration. While the direct link between fasting and testosterone is limited, there could be an indirect benefit of fasting on testosterone through the mechanism of autophagy that warrants study.

Autophagy literally means “to eat oneself” and is a form of cellular cleansing. It is a regulated, orderly process of breaking down and recycling cellular components when there’s no longer enough energy to sustain them. Autophagy is stimulated by the absence of nutrients in the body, causing the body to prioritize, which cells to keep and what cells to discard for energy, and for some reason, the body just naturally knows to start discarding the oldest and most worn-out cells. It has been proven that fasting is simply the strongest stimulus to autophagy known (J. Fung). So, what does this have to do with testosterone? Simply put, autophagy helps to maintain and optimize testosterone in the body.

A study conducted in 2018 showed that disrupting autophagy in the Leydig cells, where testosterone is produced, resulted in a decline in testosterone. The decline in testosterone was caused mainly by a defect in cholesterol uptake in autophagy-deficient Leydig cells. The results of the study revealed that autophagy promotes cholesterol uptake into Leydig cells and that dysfunction of autophagy could potentially lead to a loss in testosterone production (F. Gao).

Another benefit of autophagy on testosterone is that the process of autophagy helps to get rid of excess estrogen levels. Getting rid of excess estrogen in the body allows more testosterone to be free and utilized. While the science is still limited these studies show that autophagy, a key process of fasting may be beneficial to testosterone function and levels in the body (T. DeLauer). While more study needs to be, science suggests that fasting is beneficial to testosterone, a key ingredient in muscle health.

With the positive impact that fasting has on growth hormone, there is reason to conclude that fasting is beneficial to growth hormone and testosterone, two key hormones for muscle health, and is a third knock on the myth that “fasting burns muscle”.

The purpose of this paper was to debunk the myth that “fasting burns muscle”. To achieve this objective, it was first

established what is necessary to build and maintain healthy muscle mass. What is necessary was shown to be exercise, and proper hormonal function. The hormones mentioned are growth hormone and testosterone.

Next, an overview of the biomechanics of fasting on the body was outlined and evidence was presented that these biomechanics preserve muscle mass, not burn it thus providing the first instance proving the myth “fasting burns muscle” as false. After this, evidence was laid out that showed that fasting does not degrade the body’s metabolism or capacity for exercising. This study concluded that training in the fasted state stimulated the contribution of fat to energy provision and increased muscular oxidative capacity more than training on carbohydrates.

In addition, training in the fasted state prevented a drop of blood glucose concentration during fasted exercise. This study showed that fasted training can stimulate physiological adaptations in muscles that may contribute to improved endurance exercise performance (K.V. Proeyen). Lastly, a study in 1987 of eight young men that were tested for strength, anaerobic capacity, and aerobic endurance after a three and half day fast showed that training fasting did not impair physical performance (J.J. Knapik). This study shows that fasting can increase the body’s metabolism, and energy levels suggesting that one cannot just continue exercise while fasted, but improve exercise capability, which fosters muscle growth and development and not result in muscle loss, and thus is a second knock on the myth that “fasting burns muscle”. After examining the overall impact of fasting on muscle mass, and the impact of fasting on exercise capacity, one of the two key factors in muscle health, the impact of fasting on hormones, the other key factor in muscle health, needs to be analyzed. As previously noted, the two key hormones to look at are growth hormone and testosterone. First, growth hormone will be looked at. Fasting has been shown to be one of the most potent stimuli for growth hormone secretion.

A study from 1992, examined the effects of a 2 day fast on growth hormone by comparing growth hormone secretion levels on the second day of fasting versus growth hormone secretion levels on a control fed day. The study revealed that on day 2 of fasting, growth hormone levels increased five-fold compared to the control fed day. The reason for this was that growth hormone secretory bursts per twenty-four hours increased two-fold, and the amount of growth hormone secreted in each burst was double compared to the control fed day (M.L. Hartman). Furthermore, a study from 1988 looked at the impact of a five day fast on six normal adult male subjects. The study looked at frequency of growth hormone secretion, amount secreted in each pulse/burst, and overall growth hormone concentration in the subjects.

The study found that growth hormone pulses per twenty-four hours and the amount of growth hormone secreted per pulse roughly doubled from Day 1 to Day 5, and overall growth hormone levels nearly tripled from Day 1 to Day 5 of the fast (K.Y. Ho).

Lastly, a study conducted in 2001 study the effect of suppressing growth hormone in eight normal men in scenarios that included normal feeding, normal fasting, fasting with growth hormone suppressed, and fasting with suppression then growth hormone replacement. The study showed a decrease of IGF-1 and free IGF-1 (insulin growth factor) of 30% and 70% respectively. There was also an increase in urinary urea excretion, and serum urea (indicators of protein breakdown). Overall, the muscle-protein breakdown was increased among participants who fasted without growth hormone compared to the other 3 groups.

This study was confirmed by a replication study in 2001 as well that showed the same results, suppression of growth hormone on fasting subjects led to a 50% breakdown in muscle mass. This study demonstrates that growth hormone is a decisive component of protein conservation during fasting that is likely due to its role in the maintenance of circulating concentrations of free IGF-I (H. Norrelund). These studies suggest that fasting boosts growth hormone in the body, which aids in muscle conservation and optimization.

Next, the link between fasting and testosterone will be looked at. It is important to note that regarding the effect of fasting on testosterone this is a much less researched area compared to growth hormone when it comes to extended fasting. However, there has been a little bit of research on the impact that short bursts of fasting (i.e. intermittent fasting or time-restricted fasting) on testosterone.

The general idea is that intermittent fasting results in the stimulation of GnRH, a gonadotropin-releasing hormone, that improves the production of luteinizing hormone (LH), which in turn stimulates Leydig cells to produce testosterone. In layman's terms, the brain sends a signal down to the gonads to produce more testosterone (T. DeLauer). While the reason why short-term fasting causes this reaction is still unknown the results have been verified.

A study conducted in 1989 of a group of 8 normal men who fasted for fifty-six hours showed that the GnRH-elicited LH response increased by 67%, and the corresponding testosterone response increased by 180% (S. Rojdmarm). In 2005, a study was conducted on 52 Muslim men fasting for



the holy month of Ramadan (fasting more than 12 hours a day). The men were 18 – 24 years old, and testosterone, luteinizing hormone (LH), and follicle-stimulating hormone (FSH) levels were measured 2 days before the fasting, on day ten, day 20, and day 28 of Ramadan.

There was no increase in testosterone measured on day 20 and 28, FSH did increase significantly on day 20, and LH did not increase significantly on day 20 or 28 (B. Mesbahzadeh). Compared to the normal feeding group muscle-protein breakdown was roughly 50% higher (H. Norrelund). Based on this, an inference was presented that even while fasting the body is capable of exercise, one of the key ingredients for muscle growth. If one can exercise while fasting, one can assume that the body is capable of muscle growth even while fasting, and therefore the link between fasting and exercise is a second instance proving the myth “fasting burns muscle” as false.

Finally, the link between the function of growth hormone and testosterone, two hormones needed for muscle conservation, growth, and optimization, and fasting was examined. When it comes to growth hormone evidence was presented that clearly supports the notion that fasting improves the function of growth hormone.



When it comes to testosterone, while less convincing and needs further study, the evidence suggests that fasting could also improve the function of testosterone. If fasting can improve the function of these two hormones, which in turn improve muscle function, one could assume that this yet more evidence that fasting is beneficial for muscle health, and is, therefore, a third instance that proves the myth “fasting burns muscle” as false. Overall, there is no evidence that supports the myth that “fasting burns muscle”, and that fasting could potentially improve muscle function, growth, health, and optimization.



REFERENCES

- B Mesbahzadeh, Z Ghiravani, and H Mehrjoofard, "Effect of Ramadan Fasting on Secretion of Sex Hormones in Healthy Single Males", *Eastern Mediterranean Health Journal* 11, no. 5-6 (2005) 1120-3.
- C.P. Velloso, "Regulation of Muscle Mass by Growth Hormone and IGF-1", *British Journal of Pharmacology* 154, no. 3 (2008) 557-68.
- C Zauner, B Schneeweiss, A Kranz, C Madl, K Ratheiser, L Kramer, E Roth, B Schneider, and K Lenz, "Resting Energy Expenditure in Short-Term Starvation is Increased as a Result of an Increase in Serum Norepinephrine", *American Journal of Clinical Nutrition* 71, no. 6 (2000): 1511-5.
- F Gao, G Li, C Liu, H Gao, H Wang, W Liu, M Chen, Shang Y, L Wang, J Shi, W Xia, J Jiao, F Gao, J Li, L Chen, and W Li, "Autophagy Regulates Testosterone Synthesis by Facilitating Cholesterol Uptake in Leydig Cells", *The Journal of Cell Biology* 217, no. 6 (2018): 2103-19.
- H Norrelund, K.S. Nair, J.O. Jorgensen, J.S. Christiansen, and N Moller, "The Protein-Retaining Effects of Growth Hormone During Fasting Involve Inhibition of Muscle-Protein Breakdown", *Diabetes* 50, no. 1 (2001): 96-104.
- H Norrelund, N Moller, K.S. Nair, J.S. Christiansen, and J.O. Jorgensen, "Continuation of Growth Hormone (GH) Substitution During Fasting in GH Deficient Patients Decreases Urea Excretion and Conserves Protein Synthesis", *The Journal of Clinical Endocrinology and Metabolism* 86, no. 7 (2001) 3120-9.
- J Chertoff, "Muscular Hypertrophy", Reviewed by D Bubnis, *Healthline* (2019). J Fung, "How to Renew Your Body: Fasting and Autophagy", *Diet Doctor* (2016). J Fung and J Moore, *The Complete Guide Fasting*, Victory Belt Publishing (2016).
- J.J. Knapik, B.H. Jones, C Meredith, and W.J. Evans, "Influence of a 3.5 Day Fast on Physical Performance", *European Journal of Applied Physiology and Occupational Physiology* 56, no. 4 (1987): 428-32.
- K.V. Proeyen, K Szlufcik, H Nielens, M Ramaekers, and P Hespel, "Beneficial Metabolic Adaptions Due to Endurance Exercise Training in the Fasted State", *Journal of Applied Physiology* 110, no. 1(2011): 236-245.
- K.Y. Ho, J.D. Veldhuis, M.L. Johnson, R Furlanetto, W.S. Evans, K.G. Alberti, and M.O. Thorner, "Fasting Enhances Growth Hormone Secretion and Amplifies the Complex Rhythms of Growth Hormone Secretion in Man", *The Journal of Clinical Investigation* 81, no. 4 (1988): 968-755.
- M.D. McCue, ed., *Comparative Physiology of Fasting, Starvation, and Food Limitation* (New York: Springer-Verlag Berlin Heidelberg, 2012).
- Medline Plus, "Muscle Atrophy", U.S. National Library of Medicine (2020).
- M.L. Hartman, J.D. Veldhuis, M.L. Johnson, M.M. Lee, K.G. Alberti, E Samojilik, and M.O. Thorner, "Augmented Growth Hormone (GH) Secretory Burst Frequency and Amplitude Mediate Enhanced GH Secretion During a Two-Day Fast in Normal Men", *The Journal of Clinical Endocrinology and Metabolism* 74, no. 4 (1992): 757-65.
- R.C. Griggs, W. Kingston, R.F. Jozefowicz, B.E. Herr, G. Forbes, and D. Halliday, "Effect of Testosterone on Muscle Mass and Muscle Protein Synthesis", *Journal of Applied Physiology* 66, no. 1 (1989) 498-503.
- S Bhasin, T Storer, N Berman, C Callegari, B Clevenger, J Phillips, T Bunnell, R Tricker, A Shirzai, and R Casaburi, "The Effects of Supraphysiologic Doses of Testosterone on Muscle Size and Strength in Normal Men", *The New England Journal of Medicine* 335 (1996) 1 – 7.
- S Bhutani, M.C. Klempel, R.A. Berger, and Krista A. Varady, "Improvements in Coronary Heart Disease Risk Indicators by Alternate-Day Fasting Involves Adipose Tissue Modulations", *Obesity* 18, no. 11 (2010): 2152-9.
- S Rojdmarm, A Asplund, and S Rossner, "Pituitary-Testicular Axis in Obese Men During Short Term Fasting", *Acta Endocrinologica* 121, no. 5 (1989): 727-32.
- T. DeLauer, "Fasting and its Effects on Testosterone", *Hylete* (2018).

**THE PHILOSOPHY OF
FASTING CALLS
UPON US TO KNOW
OURSELVES, TO
MASTER OURSELVES,
AND TO DISCIPLINE
OURSELVES THE
BETTER TO FREE
OURSELVES. TO FAST
IS TO IDENTIFY OUR
DEPENDENCIES, AND
FREE OURSELVES
FROM THEM.**

TARIQ RAMADAN

Despite its recent surge in popularity, fasting is a practice that dates back centuries and plays a central role in many cultures and religions. Fasting has been shown to have many health benefits, from increased weight loss to better brain function.

URINE THERAPY

BY LAURA THACKERAY



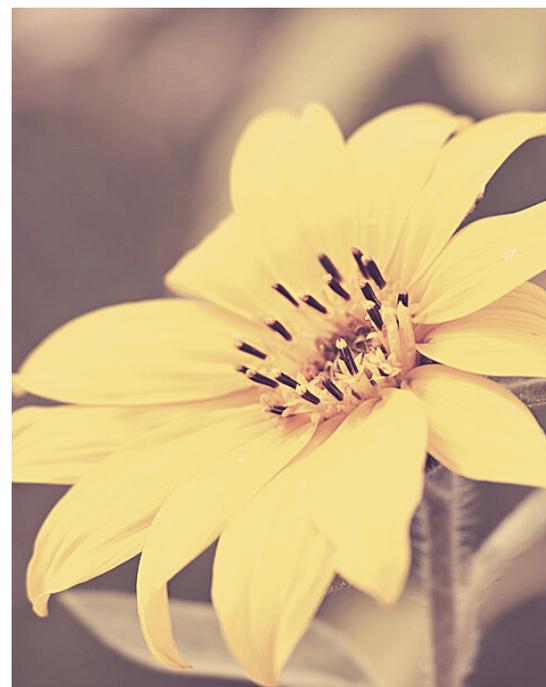
What would you say if a daily practice, regardless of age, gender, race, health, location is at everybody's disposal for free at any time of the day?

It is also available to everyone, to optimize health and well-being. Moreover, it has an effect on curing acute and chronic illnesses. So who would actually be willing to try this natural way of improving their health and ability of self-healing? Urine therapy has been available throughout the ages, in different cultures and over the world.

The question is why have we become so far removed and conditioned away from this ancient therapy in the West.

Although it may be deemed smelly, disgusting, dirty, and a toxic waste product of the body, how can there be so many case studies of people returning back to full health in a relatively short amount of time. Even when the illness was considered serious.

Urine therapy has many benefits which have been overlooked in this current climate of health and disease, and deemed socially unacceptable. This paper will discuss the historical roots of auto urine therapy which includes taking it internally and applying it topically, and why as a society we have become so far removed from it. It will conclude with some of the physical, emotional, and mental impacts of this powerful practice from a personal perspective.



WHAT IS URINE?

The body is an extremely complex and advanced intelligent system. The general composition of urine in typical cases of those who follow a fairly reasonable diet (this is subjective in these current times of processed and nutrient-dense less food and who do not take drugs or allopathic medicine) is 95% of urine is water, 2.5% urea, and 2.5% minerals, salts, hormones and enzymes (Van Der Kroon, 1993, p. 8). To give further details on the composition of urine, Loeffler (2010, p. 13) argues that "urine is mostly water, lots of urea (25g/d) and uric acid (1g/d), creatinine (1.5g), various electrolytes (10g/d, mostly NaCl), phosphate and organic acids (3g/d), only trace amounts of proteins (40-80mg/d, most of which are albumin, and only insignificant amounts of antibodies or enzymes), varying traces of (not necessarily active) hormones, glucose, and water-soluble vitamins."

Urea in large amounts is poisonous in the blood. However, when we drink the urine, it does not go back to the bloodstream immediately and according to the above two sources, the quantity of urea is considerably small. However, this could be one of the beliefs which have been strengthened and distorted overtime to distance us away from our own urine. Furthermore, urea is commonly recognized as an effective antibacterial, anti-fungal, and antiviral agent. It is purifying, it clears excess mucus, it is entirely sterile after secretion, and has a powerful antiseptic effect. Urea, normally from cows, can be found in topical anti-aging creams labeled on the packaging, but often not questioned or made aware of to the consumer.

HISTORICAL REFERENCES

Historically, urine therapy has been used and is currently used over the world in different cultures. As well as this, as Homosapians, a fetus drinks the amniotic fluid which is the foundation for existence and this is primarily made up of urine. Babies drink this, urinate and breathe it in to develop their lungs and this is crucial in their development. Native American Indian tribes who live close to nature regard urine therapy as a natural spiritual practice. Eskimos use this liquid as shampoo (ammonia found in urine when mixed with fat forms white foam to cleanse the hair). In Ancient Rome, urine was used for washing and dyeing textiles. A Parisian dentist in the 18th century regarded it as a valuable mouth wash (Van Der Kroon, 1993, p. 13). Various Eastern traditions also include urine therapy.

Ayurveda, dating back 5,000 years which is the holistic medicine regarded as the 'science of long life' includes urine therapy as 'The Mother of Ayurveda Medicine' (Van Der Kroon, 1993 p. 29). The practice referred to as Shivambu – drinking the auspicious water of Shiva as he was considered 'to look so handsome and healthy' ...'extremely vital' and have 'such a zest for life'. (p29) It could be considered that these are qualities that reflect good health.

The Tantric Yoga tradition refers to this practice as Amaroli – 'Amar' meaning immortality mirroring the concept of 'long life' in Ayurveda. The practice also includes the chanting of mantras whilst cleaning the pot and a mantra repeated seven times whilst drinking the urine. Van der Kroon (1993) claims that this therapy also features in different Eastern traditions such as Buddhist and Taoist traditions. He goes onto claim that the Buddha recommended the use of drinking urine if poisoned by a snake. In addition, monks would drink the urine of higher lamas as this was considered purer and cleaner, as the purity of the mind is considered to be paramount in this culture. This therapy is used in Tibetan medicine, specifically for those with physical ailments as well as mental illness. In countries such as Japan, Korea, and Taiwan, there are hundreds of thousands practicing this therapy. The Indian Prime Minister, Desai, drunk a glass of his morning urine daily, and he lived into his 90s.

CASE STUDIES

This therapy may seem only related to ancient traditions, or far away from the modern Western world. However, there is a large collection of case studies from those using urine therapy. These include those suffering from mild ailments to those with only a few days to live. Urine therapy can be taken internally, as well as many benefits used externally.

Armstrong's method of water fasting, urine therapy, and applying urine topically for many days, typically up to 40 days in many cases proved to be very successful and life giving and with patients reclaiming their healthfully. His pocket-sized book, written in the 1940s, has an image of a glass which unfortunately looks like mango juice, rather than urine on the front cover. This may have a deterring effect on curious readers, as when the body is hydrated is more like water. However, this book is full of case studies ranging from the common cold to curing cancer with a whole host of illnesses in between.



APPLYING THIS IN PRACTICE

The range of therapies used internally includes drinking the urine, gargling with it, using urine in enemas, douching (particularly for diseases of the vagina and yeast infections) eye and ear drops, urine sniffing (similar to using a Neti pot in Yogic traditions), homeopathic tinctures and urine injections. Externally, ideally using urine which is between 4 and 8 days old, (and which has been allowed to bacterially ferment in a glass bottle with the lid placed on), can be applied during massage, used as urine compresses for open wounds, skin diseases, and placed on organs, rubbings for bites, rashes, fungus infections and eczema, foot and hip baths for hemorrhoids, and scalp and hair massage and as shampoo as previously mentioned, (Van der Kroon, 1993 p45-55). The generalized instructions for taking urine therapy (IMPORTANT: DO NOT TAKE IF TAKING ALLOPATHIC MEDICINE) are to start with the afternoon urine.

Once you have become accustomed to this you can take the first urine of the day which is more potent with minerals, salts, enzymes, and hormones. The collection of the urine is midstream, as the beginning is to cleanse the urine passage making it sterile and the end part may contain sediment and is less valuable. It is recommended to drink one hour after eating and to wait 30 minutes before eating. The urine can be taken first thing in the morning and throughout the day as deemed necessary (Van der Kroon, 1993, p45). The taste may vary throughout the day and is dependent on the personal diet followed. It is also affected by salt, herbs, and level of hydration. The urine is a direct reflection on the provider of the urine which on subconscious levels, society in the Westernised world is aware at some level of their far from the optimum level of health and well-being.

THE AUTHOR'S PERSONAL REFLECTIONS

I would like to share some personal reflections during my relatively short period of trying urine therapy. In my general good health, after doing urine therapy internally and externally, I can note some physical observations.

- My hair was noted by a friend to be shinier and bouncier.
- My skin was less dry when applied after a shower and noticeably softer.
- I had an itchy bite and a cut on my finger. Just a few droplets of fresh urine took away the itchiness immediately and the small cut seemed to heal quickly. (This reminded me of the incredible power of breastmilk and how these liquids are potent and self-healing).
- My second toe on my right foot suddenly seemed swollen, all around the nail and the toe. It was painful to touch, but there was no evidence of any incision. Simply wetting tissue paper in my urine, and wrapping it around the toe for 30 minutes, the pain disappeared. It is no longer sore to touch and the swelling has gone down.



“First, it cleanses, then frees from obstruction and finally rebuilds the vital organs and passages after they have been wasted by the ravages of disease. In fact, it rebuilds not only the lungs, pancreas, liver, brain, heart, etc., but also repairs the linings of the brain and bowel and other linings, as has been demonstrated in the case of many killing diseases, such as consumption of the intestines and the worst form of colitis. In fine, it accomplishes what fasting merely on water or fruit juices (as some naturopaths advocate) can never achieve.”

Armstrong cited in Van der Croon (1993, p9)

I have had a type of dermatitis on my hands for as long as three years which comes and goes depending on the level of stress, location and fasting cycles. Washing my hands in urine just for a few days cleared this. (It's unclear if this is due to topical application or internal use). I have had an itchy left nipple for many months. Three days into a juice fast, the itchiness disappeared. Three days post fast, only eating organic fruit and raw vegetables, disappointingly, the itchiness returned. A few days into drinking urine (not used topically) the itchiness disappeared and has not returned.

Having cultivated the trust and being informed of this practice, it is not so important to know exactly how urine therapy works, but in having the faith that it does, and it is a way of connecting to Mother Nature's cycles within the body.

To continue the personal reflection, on a mental level, initially it felt there was a barrier to overcome and there was some resistance. However, as I felt mentally prepared and inspired to try my urine, I was able to drink the whole jar with little aversion and was pleasantly surprised.

On an emotional level, drinking my urine first thing in the morning and throughout the day is very self-empowering, freeing myself of any external needs and dependencies. I feel satisfied, with little desire to drink or eat.

On a spiritual level, my mind feels calmer, especially in the morning which is noted in my morning meditation practice. This could be due to the melatonin (the hormone which regulates sleep patterns) which is secreted in the urine in the morning urine.

This may explain why Vedic texts recommend that yogis practice *amaroli* to enhance the ability to meditate more deeply (Van der Kroon, 1993, p39)

Finally, I would like to add that this practice has been initiated in nature, away from any biomarkers of stress, pollution and radiation. The ease and willingness to do this may be due to the feeling of being cleaner and more connected to nature, and thus being in a different frequency, compared with a more modern way of life.

ADDRESSING SOCIAL RESISTENCE

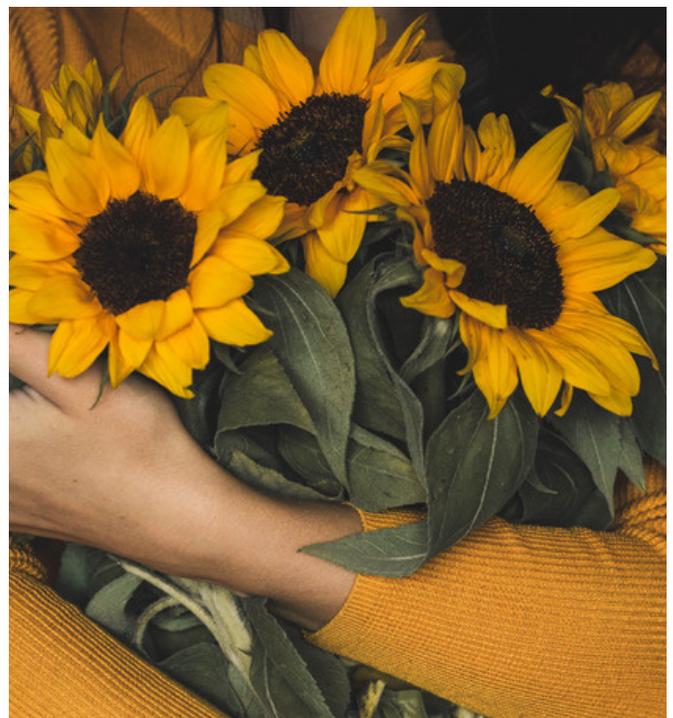
Addressing specific barriers could be useful in making this therapy more widely accepted. Van Der Kroon (1993, p. 61) considers some of the most common barriers for why we are so distant from this traditional practice.

Considered as a waste product by the body, this could be related to the fact that it is regarded as poisonous. However, it has been scientifically proven as mentioned above what the components of urine are. The kidneys filter 1700 litres of blood per day, and do not remove poisonous substances, the liver, intestines, the skin and exhaling do this.

So why is it excreted you may ask? You can consider that the body, as in nature, functions in cycles. Just as the leaves fall off the trees and decompose to nourish the earth for further growth, the body has the capacity to do the same, just as the time in the womb as a fetus.

So why are we so removed from this practice. This is due to our social conditioning and cultural acceptance or lack of, and lack of direct contact with natural healing modalities. Modern lifestyle diseases include obesity, diabetes, hyperthyroidism, cancer and psoriasis. These can be attributed to different lifestyle factors such as poor nutrition including foods such as those which produce high uric acid quantities which is excreted in the urine. High uric acid quantities can be found in patients who suffer from gout. This may contribute to a rejection of drinking one's own urine. However, it is not instinctive to drink alcohol, or smoke cigarettes, take chemical drugs, allopathic medicine or eat processed food full of preservatives and conservatives. But we persist and we go against our nature and instinct and make these our normal practices. Urine therapy is an example of how far we are removed from our inherent connection with our own nature.

Horl (1999) states that there are symptoms such as 'nausea, vomiting, headache, palpitations, diarrhea or fever' (p111) which may be reported. These, however, could be considered as part of a healing crisis, a period of time necessary for the person to heal. This could be due to the level of detoxification that the body is able to release after many years. Toxins may have been stored from childhood and are then able to be eliminated. The practice is recommended to continue but the intensity may be decreased or a temporary rest may be in need (Van Der Kroon, 1993, p. 56). Encouraging greater connection to our bodies is the key for this process as each individual can personally decide on their level of autonomous healing.



WHAT IS THE VALUE OF URINE IN THE PHARMACEUTICAL INDUSTRY?

Even though there are many benefits to urine therapy, there is considerable little scientific research. Interestingly though, the pharmaceutical companies collect urine from portable toilets in the U.S. and China to extract growth hormones and insulin.

One reason this is carried out is specifically for an enzyme called Urokinase. This is said to dissolve blood clots in heart attack patients (Van der Kroon, 1993, p.23). This is a 500 million dollar industry, fairly lucrative for a product that is considered to be dirty, smelly, and a waste product. Other medical products obtained from urine claimed by Horl (1999) are fertility drugs, diuretic substances from urea, estrogens, and ointments containing urea for burn injuries, local therapy, and wound infections.

In light of the current Covid-19 situation, it would be an interesting situation if the global population as a whole started the practice, as he argues that 'in the absence of any symptoms and diseases, the daily oral intake of one's freshly voided urine should prevent several diseases such as viral infections' (p112).

URIC ACID

Uric acid is a chemical excreted by the urine which is made when the body breaks down purines. Purines are found in food such as liver, game meat, anchovies, sardines, gravy, dried beans and peas, mushrooms, and other foods. So and Thorens (2010, p1793) argue that uric acid has been "recognized to be a powerful antioxidant that scavenges singlet oxygen, oxygen radicals, and peroxy nitrite and chelates transition metals, to reduce, for instance, iron ion-mediated ascorbic acid oxidation."

These antioxidant actions may have a protective effect against cardiovascular disease, cancer, and aging. The same authors go on to argue that uric acid has pro-oxidant effects too, but more large-scale, longer-term research is needed. Glantzounis et. al. (2005) also supports the notion that uric acid can play a therapeutic antioxidant role but again call for more well-designed research to be carried out.



CONCLUSION

It can be argued that the body has many cycles and urine can be considered as a useful information card. Through this pathway, the urine carries information back to the body so it can respond and react accordingly to the feedback.

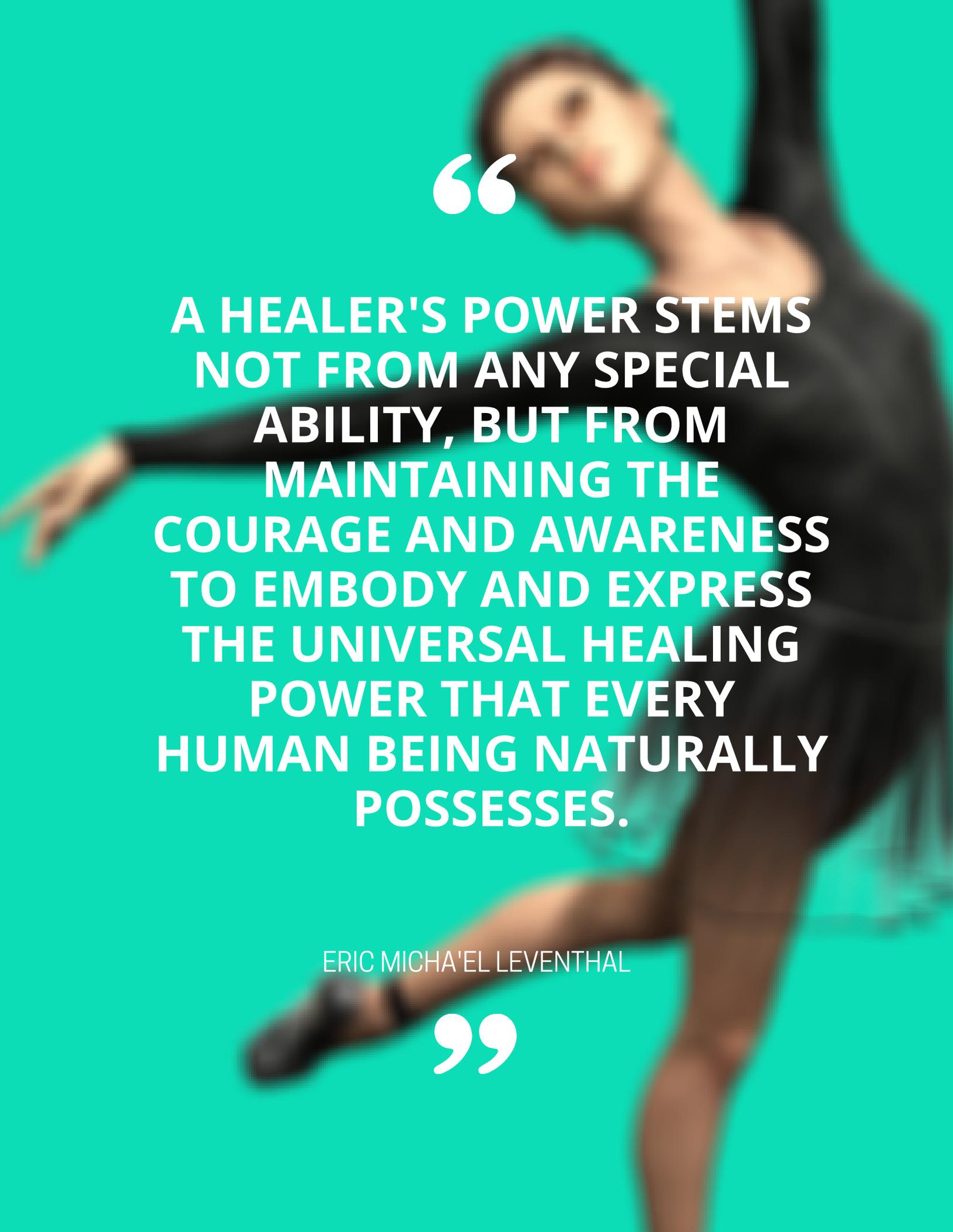
In this way, by drinking our own urine, we are making the bodywork with more efficacy and focusing on prevention, as well as having the capacity of self-healing. The current modern economic and pharmaceutical framework does not support this free self-healing tool.

However, if we can question this, trust in the wisdom of Eastern philosophy, those more connected to Mother Nature and countless successful case studies, may the personal inquiry and experimentation speak for themselves.



REFERENCES

- Armstrong, J.W. (2004). *The Water of Life*. Pilgrims Publishing
- Glantzounis, G. K., Tsimoyiannis, E.C., Kappas, A. M., and Galaris, D.A. (2005). Uric Acid and Oxidative Stress Current Pharmaceutical Design, 11 (32) 4145-4151 <http://www.eurekaselect.com/60508/article>
- Horl, W.H. (1999). The Medicinal Use of Urine American Journal of Nephrology, 19 (2) 111-113 <https://www.ncbi.nlm.nih.gov/pubmed/10213804>
- Loeffler, J. M (2010). The Golden Fountain - Is Urine the Miracle Drug No One Told You About? Pan African American Journal, 5 (13) <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3032615>
- So, A. and Thorens, B. (2010). Uric Acid and the Transport of Disease The Journal of Clinical Investigation, 120 (6) 1791-1799 <https://www.jci.org/articles/view/42344>
- Van Der Kroon, C. (1993). *The Golden Fountain: The Complete Guide to Urine Therapy*. Echo Point Books and Media

A woman with dark hair, wearing a black long-sleeved dress, is captured in a graceful yoga pose. She is leaning back with her right leg extended upwards and her left leg bent at the knee. Her arms are extended outwards, and her head is tilted back. The background is a solid, vibrant teal color. The overall image has a soft, ethereal quality.

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**A HEALER'S POWER STEMS
NOT FROM ANY SPECIAL
ABILITY, BUT FROM
MAINTAINING THE
COURAGE AND AWARENESS
TO EMBODY AND EXPRESS
THE UNIVERSAL HEALING
POWER THAT EVERY
HUMAN BEING NATURALLY
POSSESSES.**

ERIC MICHA'EL LEVENTHAL

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THE GUT: WHAT ARE WE MISSING?

By

JIVANTI MURUGAIYAN

We are microbes first, then human.

The gut microbiome is the totality of bacteria, viruses, protozoa, fungi, other microorganisms and their collective genetic material that is present in the gastrointestinal tract (GIT). The gut microbiome is now recognised for its' crucial role of interacting with virtually all human cells. Between the years 2013 and 2017 more than 12,900 publications were focused on our partners in the gut. This number accounts for more than 80% of the overall publications of the last 40 years (since 1977) on this topic.

This finding crucially highlights the fact that something new, important and ever changing is always coming up within this field necessitating for advancement and awareness.

Past Research

In the late 1990s, scientists were using DNA and RNA sequencing to study complex relationships of microbiome, its' interaction with host and the community it forms. The first rRNA sequencing study of the human gut microbiome was performed in 1996. 10 years later, this led to the first metagenomic sequencing of the human gut microbiome. Metagenomic sequencing examine thousands of organisms in parallel and comprehensively sample all genes, providing insight into their biodiversity and function.

These researches then gave birth to larger scale studies including the Human Microbiome Project, the Flemish Gut Flora project and the American gut project. The findings characterised these microbiomes



and elucidate their roles in health and disease states. [3]

Many research scientists, as well as experts from the field of alternative medicine, have been continuously adding knowledge, research studies, technological and diagnostic innovation to the field of the GUT microbiome.

A list of these experts and a reading list are listed on the Reference page. Some scientific literature has been referenced here.

General Consensus

The gut microbiome appears to be important in the digestion of food and extraction of nutrients.

It also modifies the host immune response to protect against infection. In specific disease states such as cardiometabolic disorders, inflammatory bowel disease, neuropsychiatric diseases, and cancer, the gut microbiome has been found to regulate the host metabolism. The crucial role in brain development and mood regulation has also been identified. [2, 4-5]

All of these functions are dependent on the microbiome biodiversity. The imbalance results in dysbiosis (imbalances in the bacteria growth and type). [1]

Dysbiosis is at the backend of many common gastrointestinal diagnoses such as Small Intestine Bacterial Overgrowth (SIBO), Small Intestinal Fungal Overgrowth (SIFO), Inflammatory Bowel Syndrome (IBS), and Leaky Gut Syndrome.

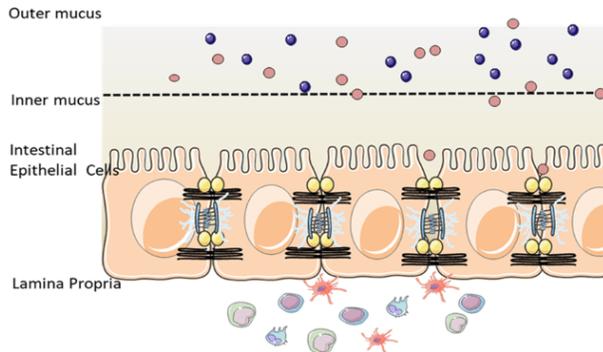
The Deeper Truth of Intestinal Barrier & Biofilm

Microorganisms constantly interact with host cells at different levels to impact digestion, immunity, and metabolism. All of this interaction happens within the intestinal barrier or the GUT terrain.

The intestinal barrier consists of the intestinal epithelial cell (IEC) layer, the mucosal layer, and the immune cell layer. [8] (Figure 1.0 Intestinal Epithelial barrier) The epithelial cell layer is a one-cell-thick internal lining of the gut. Within the IEC are the tight junction proteins that maintain the epithelial barrier

In specific disease states such as cardiometabolic disorders, inflammatory bowel disease, neuropsychiatric diseases and cancer, the gut microbiome has been found to regulate the host metabolism. The crucial role in brain development and mood regulation have also been identified.

Intestinal Epithelial Barrier



integrity. Beneath the epithelial layer is a thin layer of connective tissue, the lamina propria which functions to nurture healthy communication between the microbiome and immune cells. Some of the immune cells found are dendritic cells, T cells, B cells, and macrophages. Above the IEC is the first layer of defense which is formed by the mucosal layer.

The interface of the microbes with the mucus layer, epithelial layer, and immune cells is pivotal to maintain the homeostatic health in the GUT. A compromise in the barrier integrity is linked to many common gastrointestinal symptoms and pathological conditions such as inflammatory bowel disease, obesity, and metabolic disorders. [6-8]

Some examples of compromised barrier integrity are the absence of mucin, a type of protein in the mucous layer predisposing someone to intestinal inflammation, and the loosening of the tight junction proteins leading to the leaky GUT syndrome.

A break in the integrity of the intestinal barrier can result in dysbiosis (imbalances in the bacteria growth and type). Dysbiosis results in the formation of biofilm or digestive plaque. (Figure 1.1 Formation of biofilm). The biofilm is a coating of pathogenic bacteria on the epithelial cell layer that proliferates bad bacteria.

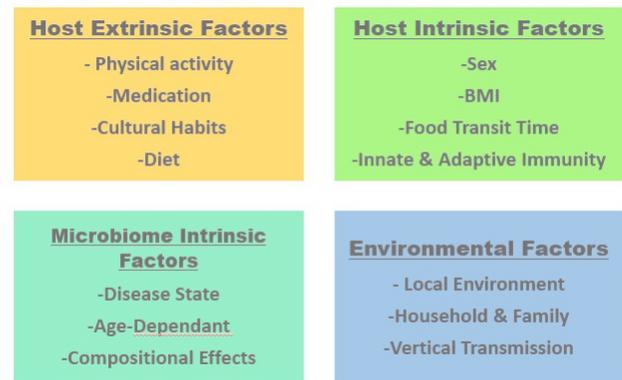
In the case of someone who has small intestine bacteria overgrowth (SIBO), they have an overgrowth of Gram-Negative bacteria such as E.Coli & Pseudomonas Auriginosa in the small intestine. This biofilm resulting from the overgrowth is hard to be broken down and can release lipopolysaccharide (LPS) or endotoxin. LPS activates the inflammatory pathways in the body by stimulating the immune cells. This pathway is a common denominator for all autoimmune diseases.

Factors Affecting the Epithelial Barrier

Changes in gut microbiota composition and activity remarkably affect the turnover rate of the intestinal epithelial cells. [10] IECs are rapidly renewed and replaced every couple of days. [9] Recent evidence suggests that different organs are directly under the influence of bacterial metabolites that may directly or indirectly regulate physiological and pathological processes throughout the body. [10]

It is worthy to note that while dysbiosis is important to be restored, knowing that we have absolute control over our epithelial barrier by virtue of our lifestyle is a massive game-changer.

By being aware of the influencing factors of the microbiome as shown in the figure below, we are able to appreciate that a healthy microbiome is a result of a healthy interaction between its host, the environment, and its own intrinsic factors albeit the apparent complexity [10].



Akkermansia muciniphila & Postbiotics

A new bacterium that has received some extensive research is Akkermansia muciniphila, an intestinal anaerobic gram-negative bacteria that is extensively present in the IEC. [12] This bacterium maintains the integrity of the IEC because it degrades mucus and prevents the tight junction protein from leaking. As a result, endotoxins or lipopolysaccharide (LPS) is prevented from entering the blood.

This prevents the trigger for systemic inflammation and a host of metabolic complications such as improper glucose and fat metabolism. (Figure 1.2) A. muciniphila produces Amuc1100, a protein that acts as a postbiotic. Postbiotics are inactivated, non-viable probiotics that have positive biological responses. [1]

A.muciniphila corresponded to a reduction in inflammation and has been studied in a few types of research involving diabetes, cancer, obesity, weight loss, type 2 diabetes, and inflammatory bowel disease. [2,5,11-13] The ways in which we can grow this bacterium will be discussed after.

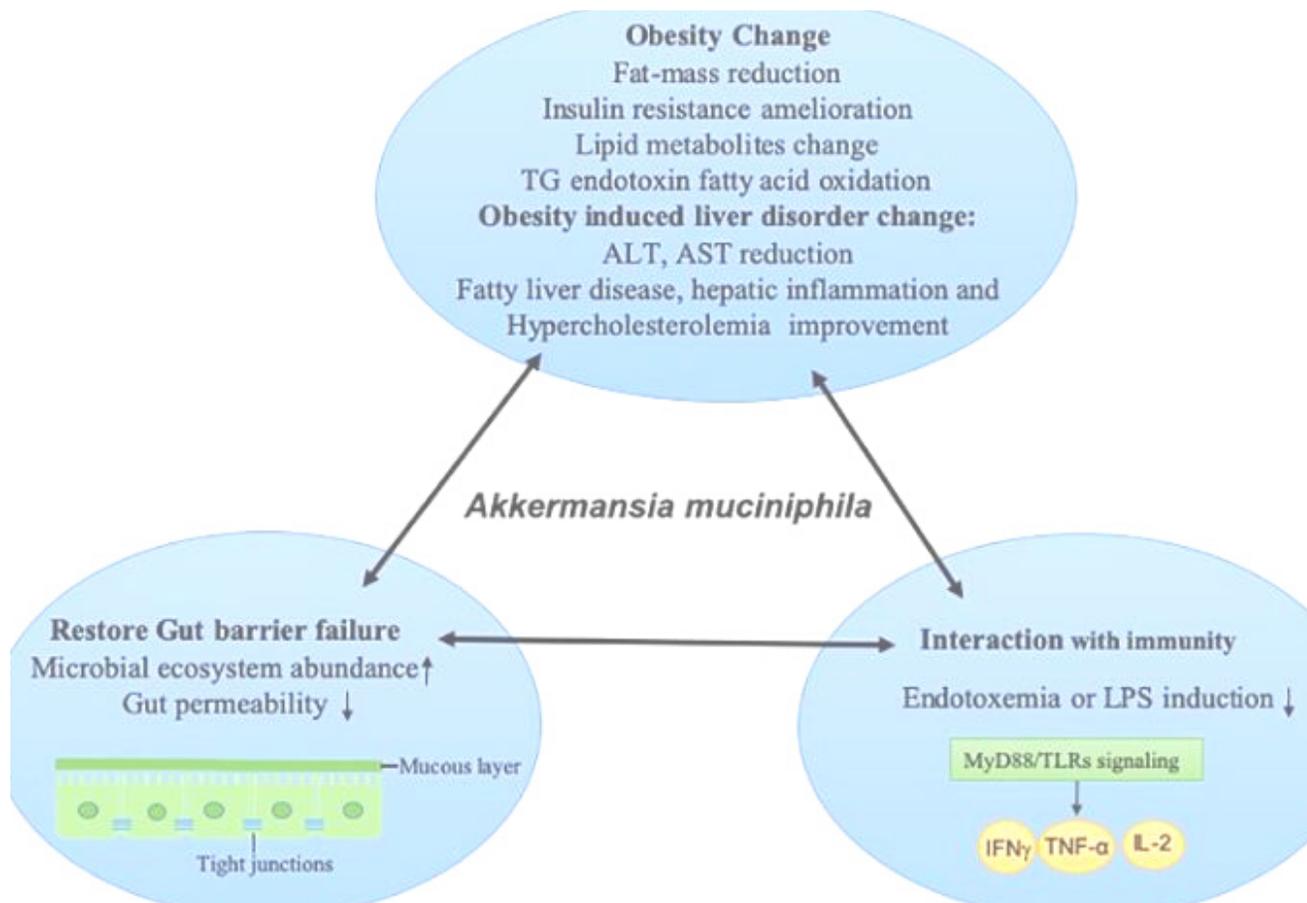
Probiotics & Digestive Enzymes

Within the microbiome research field, the use of probiotics has been studied extensively in inflammatory bowel disease, atopic dermatitis, respiratory or genitourinary infections, and H. pylori adjuvant treatment.[10, 16] Results though promising are inconsistent. It is difficult to form an agreed opinion on the benefits of probiotics as even the most detailed meta-analyses (MA) of randomized clinical trials (RCT) finds inconclusive evidence of their benefits.

This is not necessarily a contradiction but may only mean that the specific probiotic species did not work under the specified conditions.

Perhaps digestive enzymes may have a bigger but under-researched role in the field of GUT health. Many types of research among digestive enzymes reported positive effects in reducing gastrointestinal symptoms and a promise in the advancement of enzymatic digestive therapy. [6][8][16] The ways in which we can make more digestive enzymes by changing our diets will be discussed next.

The Role of A.Muciniphila in Preventing Systemic Inflammation



Source: Xu Y et al (2020) Function of Akkermansia muciniphila in Obesity: Interactions With Lipid Metabolism, Immune Response and Gut Systems

THE GUT Care Formula

CHECK - The microbiome imbalances

Some ideal candidates recommended for a GUT microbiome test (via stool or blood) are people suffering from autoimmune diseases, chronic digestive complaints, Irritable Bowel Syndrome (IBS), Inflammatory Bowel Disease (IBD), skin problems (eczema, psoriasis), anxiety, depression, diabetes, weight loss, autism, and behavioral disorder. A DNA sequencing PCR type of microbiome test that is now readily available as a home test kit can point someone in the right direction of the diversity of the microbiome (fungus, bacteria, parasite, virus, etc) alongside inflammation and immune markers. The right kind of probiotics, digestive enzymes, or herbal supplements can then be tailored according to the results of the test. Other tests that can be done are mycotoxin screening and organic acid urine test. (More details found in Reference)

ENHANCE - Eat the Right Variety of Food, Probiotics & Digestive Enzymes

Over the last 20 years, numerous data have shown that diet composition (e.g., fatty acids, non-digestible carbohydrates, prebiotics, polyphenols) and nutrients strongly contribute to shaping the gut microbiota. [12] Depending on the substrates available from food (amino acids, lipids, carbohydrates) present in the gut lumen, gut bacteria can generate specific metabolites. These metabolites decide how optimum we function daily or what disease is brewing inside us.

Focusing on whole fresh food with the 7 rainbow colors paying particular attention to flavonoid & polyphenol-rich food (cranberry, pomegranate, curcumin) with liberal uses of herbs and spices. This helps in growing *A. Muciniphila* and digestive enzymes.

Choose the right probiotics that have a mixture of bacteria and fungi. Add digestive enzymes to support your gut health if necessary.

CLEANSE - The Detoxifying Organs

Begin by going on a deep detox or cleanse by removing any offending agents that give you the symptoms. Removing dairy, gluten, peanuts, soy, eggs, meat, and poultry may help you to solve 50% of your problems. Then start by deeply nourishing all the detoxifying organs of the body mainly the liver, kidney, adrenals, and lymph.

A 7-day juice fast of vegetables and fruits together with The Initiation helps for a deep cleanse at the physical, mental, emotional and spiritual level. Body dry brushing and Abhyanga with oils as according to individual Ayurvedic constituents can be done to balance off the physical imbalances that are caused by the GUT imbalance. Avoid excessive sugar, artificial sweeteners, salt, and alcohol as all of this feeds the bad bacteria.

REGULATE- The Factors Influencing the Intestinal Barrier

Regular fasting, practicing emotional and mental hygiene, balancing the circadian rhythm of sleep and wake cycle, managing stress adequately, getting adequate sunlight, maintaining a clean and toxic-free environment, and using minimal or no medications especially antibiotics, proton pump inhibitors, food additives, and cosmetics as possible.



VEGETABLES

Cruciferous Vegetables

-Cauliflower, cabbage, bok choy, broccoli, artichokes, and brussels sprouts

Allium Family

-Onion, shallots, leeks & garlic

Leafy vegetables- Local green leafy vegetables, kale, mustard greens, spinach, chard

Others

-Beets, Asparagus, Fennel, Green peas, jicama, sweet peas

STARCHES

Polenta, Chickpeas, Lentils and other legumes, cooked and cooled white potatoes, white rice, green bananas, plantains, yam, and sweet potatoes.

NUTS

Almonds, Cashews, Pistachios

FRUITS

Blueberries, Pomegranate, Apples, Watermelon, Banana, Figs, Cherries, Papaya, Cranberry

PROBIOTICS CONTAINING FOOD

Non-Dairy coconut or almond yogurt.

Fermented Soy- Tempeh, miso, tofu, nato

Fermented Beverages- Kefir, Kombucha & Kvass

Fermented Vegetables- Sauerkraut & Kimchi

Herbs & Spices

Coriander, Basil, Turmeric, Peppermint,

Rosemary, Tarragon, Thyme, Cinnamon,

Chamomile, Paprika, Nutmeg, Chili Peppers.

SOLUTION TO THE GUT PROBLEM

Two perspectives are to be considered when solving a GUT problem. One of the clients coming with the GUT issue and one of the health coaches is trying to lead the clients to their own path of healing by pointing them in the right direction.

It is important to note that when someone walks in with a GUT problem, there is a need to look at the entirety of the GUT health, the underlying causes, and the entire physical, mental, and emotional health of the person. We need to understand that a GUT issue can leak into other systems and cause a general upheaval within the body.

Hence, the role of a coach really is to ask the right question particularly on what is happening at the back end (circadian cycle, energy level, hormone, cognitive capabilities, past trauma, relationships, past emotional work is done, an environmental trigger, etc.) in a loving, nonjudgmental way to build the rapport and assisting them through various healing modalities while still being flexible to the kind of approach we want to put forth to the client.

Advising on the right kind of test (stool, blood work) after gathering all the information will help in discussing with the client more objectively. The tests will serve as a yardstick for the right treatment in the future as well as gear someone to take full accountability towards something they can change: their lifestyle.

To be in line with the teachings of TIFA, ultimately, we want to give back agency to the client to change their lifestyle to something that is standard and actually possible for everyone.

A diet rich in whole life food of fresh fruits and vegetables, deeply emotional and mental hygiene, no disruption in the natural circadian rhythm, regular fasting, sunlight, minimal exposure to any form of toxins, and a stress-reducing mechanism must be set in place for every client regardless.

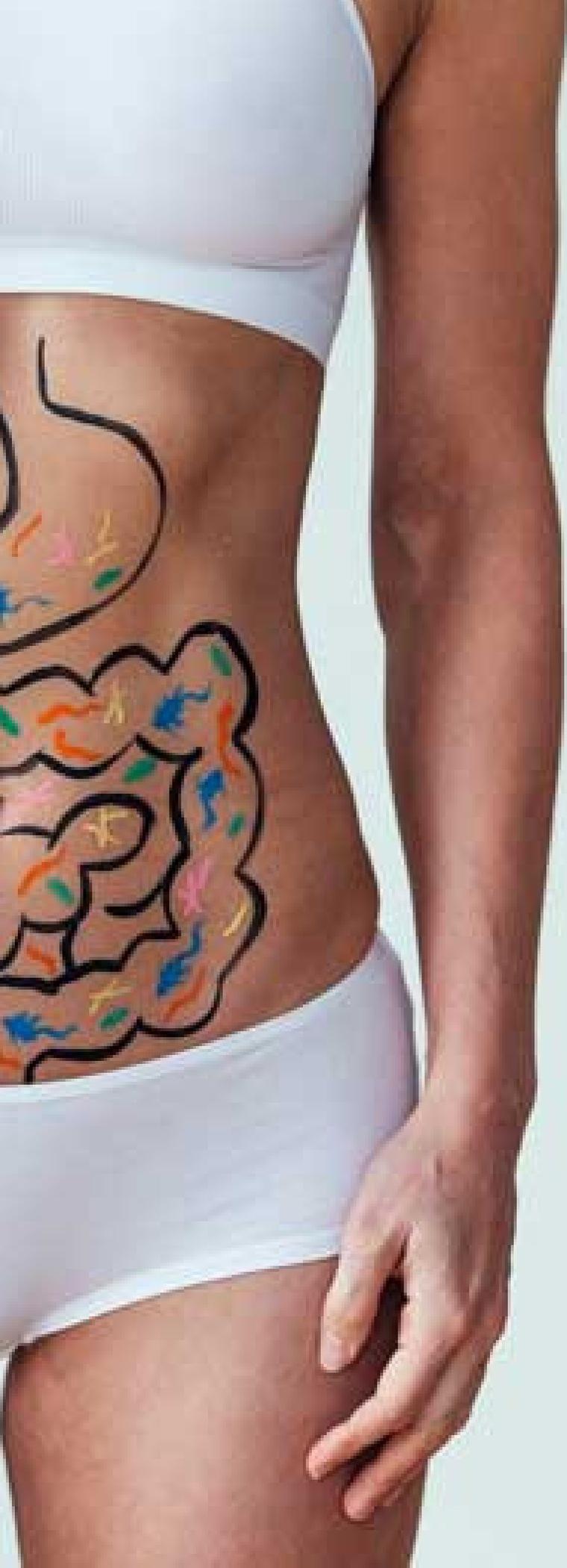
On the flip side, there is also a need to appreciate that habit change requires a change of habits. The psychological and behavioral aspects of this key point of healing (i.e. lifestyle medicine) may be the most challenging aspect of being a lifestyle medicine coach or even up leveling a healthy person. The standard protocol though so simple will not be established at the point of meeting a client in a clinical setting because it involves a deep paradigm and perception shift.

The coach plays an important role in guiding this behavioral change which contributes to the treatment success. Through the abundance of knowledge, self-experiments, and deep embodiment of this lifestyle mediated approach, a coach can practice compassion and empathy to understand the feelings of the client on the different modalities suggested and tackle resistance objectively as they come. Knowledge, when used with adequate emotional sensitivity, a helpful attitude to explain the 'why' behind things can steer behavioral change in another person.



REFERENCES

1. Gail A.M & Kristen (2019) Gut Microbiome, Chapter 4- Adult Short Bowel Syndrome Book. 45-54. <https://doi.org/10.1016/B978-0-12-814330-8.00018-4>
2. Cani P.D Human Gut Microbiome: Hopes, Threats and Promises. *Gut* 2018;67:1716–1725
3. David Reman & Anand Jagatia (2109): The Origins of human microbiota research. *Nature Research*.
4. Tang, H. & Luan, R. & Zhai, S. (2012). Digestive Enzyme for Dyspepsia: A systematic review. *Chinese Journal of Evidence-Based Medicine*. 12. 714-721.
5. Caesar, Robert, Tremaroli, Valentia, Kovatcheva-Datchary Petia, Patrice D (2015). “ Crosstalk between Gut Microbiota and Dietary Lipids Aggravates WAT Inflammation through TLR Signaling. *Cell Metabolism*. 22(4): 658-668
6. Ghoshal, UC, Ratnakar S, & Ghoshal U (2017) Small Intestinal Bacterial Overgrowth and Irritable Bowel Syndrome: A Bridge between Functional Organic Dichotomy. *Gut and Liver*. 11(2)196-208
7. Tuddenham S, Sears CL. (2015) The intestinal microbiome and health. *Current Opinion in Infectious Diseases*. 28(5):464–470
8. Chelakkot C, Ghim J & Ryu SH.(2018) Mechanisms Regulating Intestinal Barrier Integrity and Its Pathological Implications. *Experimental & Molecular Medicine* 50. 103-28
9. De Mey, J.R & Freund, J.N (2013). Understanding Epithelial Homeostasis in the Intestine: An Old Battlefield of Ideas, Recent Breakthroughs and Remaining Controversies. *Tissue Barriers*. 1, e24965
10. Cani P.D, Knauf C. (2016). How Gut Microbes Talk to Organs: The Role of Endocrine and Nervous Routes. *Molecular Metabolism*; 5(9): 743-752
11. Depommier C, Everard A, Druart C, et al. (2019) Supplementation with *Akkermansia Muciniphila* in Overweight and Obese Human Volunteers: A Proof of Concept Exploratory Study. *Natural Medicine*.
12. Yu X, Nin W, Tan HY, Li S, Zhang C & Feng Y. (2020) Function of *Akkermansia Muciniphila* in Obesity: Interactions with Lipid Metabolism, Immune Response and Gut Systems. *Frontiers in Microbiology*.
13. Maria Rapala-Kozik, Marcin Zawrotniak, Mariusz Gogol, Dominika Bartnicka, Dorota Satala, Magdalena Smolarz, Justyna Karkowska- Kuleta and Andrzej Kozik (November 5th 2018). Interactions of *Candida albicans* Cells with Aerobic and Anaerobic Bacteria during Formation of Mixed Biofilms in the Oral Cavity, *Candida Albicans, Doblin Sandai*, IntechOpen, DOI: 0.5772/intechopen.81537.
14. Rowland, I., Capurso, L., Collins, K., Cummings, J., Delzenne, N., Goulet, O., Guarner, F., Marteau, P., & Meier, R. (2010). Current Level of Consensus on Probiotic Science--Report of an Expert Meeting--London, 23 November 2009. *Gut Microbes*, 1(6), 436–439. <https://doi.org/10.4161/gmic.1.6.13610>
15. Hoveyda, N., Heneghan, C., Mahtani, K.R. et al. A Systematic Review and Meta-analysis: Probiotics in the Treatment of Irritable Bowel Syndrome. *BMC Gastroenterol* 9, 15 (2009). <https://doi.org/10.1186/1471-230X-9-15>
16. Ianiro, G., Pecere, S., Giorgio, V., Gasbarrini, A., & Cammarota, G. (2016). Digestive Enzyme Supplementation in Gastrointestinal Diseases. *Current drug metabolism*, 17(2), 187–193. <https://doi.org/10.2174/138920021702160114150137>



**ALL
DISEASE
BEGINS IN
THE GUT.**

HIPPOCRATES



FECAL MICROBIOTA TRANSPLANTATION (FMT)

BY AMANDA ARANEDA

There is growing scientific evidence showing that the condition of a person's microbiome plays a huge role in maintaining the health and immune system of the host.

Modern life brings countless ways of interrupting the balance between a person's internal and external bacterial world. The first way of interfering with the human's microbiome is directly linked to the state of modern food, being sprayed with insecticides, rodenticides, herbicides, fungicides, and antimicrobials.

On the other hand, one cannot forget that cattle are given antibiotics and grow faster than they would naturally do. Besides living in reduced spaces, a significant consequence is that they carry more illnesses and thus needing even more medication.

The second unquestionable way to ingest large amounts of toxins is through the lungs by breathing in pollution. The third way is related to the usage of toxic cleaning and cosmetic products. All these aspects have progressively and increasingly affected our health in one way or another.

Furthermore, the lack of contact with nature is being underestimated, especially for humans living in urban environments.

As the rapid adaption to a speedy technological and digital lifestyle progresses, it leads to the fact that the population is forgetting what our ancestors have relied on and made use of in the natural world, in order to maintain a healthy microbiome and a strong immune system. This subject is widely known as probiotics, to be more precise, Soil Based Organisms (SBO).

As they have been slowly washed off from the soil and food, it leaves humans with little to no way of effectively replenishing what modern lifestyle is depriving us of. This is of great consequence. It has been seen through trial and error for a few thousands of years, that fecal microbiota transplantation (FMT) has been used to reestablish and replenish the gut microbiome in animals and humans. We discuss here the history and present status of FMT. Together with a few cases showing surprising results, this brings curiosity to those willing to go beyond traditional methods.

THE HISTORY OF FECAL TRANSPLANTATION

The history of FMT or Bacteriotherapy dates back more than 3,000 years ago in India. The Charaka Samhita (Van Loon, 2002) and many other ancient Ayurveda texts recommend the intake of cow dung and urine for many stomach ailments. About 1700 years ago in China, an ancient researcher by the name of Ge Hong used 'yellow soup' (Shi & Yang, 2018) to treat patients with diarrhea. The 'soup' was drunk by his patients, accounting possibly for the failure of this technique.

Around the mid-1500's Italian anatomist and surgeon, Dr. Fabricius Acquapendente (Choi & Cho, 2016) used fecal transplantation as a method to treat livestock. He treated horses with diarrhea by infusing stool from healthy horses into the rectum of the sick animals. Scientists then experimented with the benefits of what they called 'Rumen Transfaunation' (DePeters & George, 2014) in animals showing symptoms of toxic compounds intake from plants.

Slowly after Dr. Fabricius Acquapendente used this technique, a number of European doctors (Frissen, de Groot, De Clercq & Nieuwdorp, 2017) started studying the therapeutic effects of fecal transplantation. There were several trials done by several doctors until early 1940 when German soldiers of the 'Afrika Korps' were dying of dysentery, which is an infection of the intestines resulting in severe diarrhea with the presence of blood and mucus in their feces.

German scientists were determined to find a solution to this condition affecting so many soldiers. After observation of African farmers drinking camel stool when showing the first signs and symptoms of gastrointestinal illness, German scientists rushed to analyze this technique. They isolated and cultivated *Bacillus Subtilis* (Earl, Losick & Kolter, 2008), which then was administered to the infected soldiers, resulting in the complete clearance of dysentery in many affected.

After success shown by soldiers in Africa during World War II, several scientists studied and developed different ways to cure patients with fecal microbiota transplantation. They developed pills containing stool from healthy donors as one of the techniques and a few years later treated pseudomembranes colitis patients with fecal enemas as well. In the early 1990s, scientists started using mice to evaluate the effects of microbiota on body weight and metabolism. A few years later they found evidence of fecal transplantation having several different effects.

For example, they found a link between fecal transplantation affecting their body weight and metabolism. These mice proved obesity was a transmissible trait through FMT.

FMT IN MODERN SCIENCE

In 2011 a group of practitioners from the UK initiated a search around the world looking for the latest technology and developing methods regarding FMT. Their research resulted in discovering that there were only 6 published papers about the subject. This group of practitioners turned to Prof. Thomas Borody, who founded The Centre for Digestive Disease (CDD) in 1984 in Sydney, Australia. He became a world-renowned leader in the clinical microbiota dating back to 1988 when he started performing what is now called Fecal Microbiota Transplantation (FMT). After visiting Prof. Thomas Borody, this group of practitioners founded Taymount Clinic in the UK in 2012 with the desire of leveling up everything about FMT. The writer of this paper contacted Taymount Clinic to get to know how the process of introducing new methods of FMT has been to date.

FMT AT TAYMOUNT CLINIC (2012-PRESENT)

Taymount Clinic shares informative content on its website and on social media. They have published videos from previous patients sharing their stories, diagnoses, and reasons why they chose this clinic, etc.

One can find countless videos of patients showing not only an important amount of success stories but also that the clinic by no means would promise any success rate to anybody. Although they are collecting all their data, more research is needed to set success rates regarding any specific illness. When it comes to familiarizing their patients with FMT, it is extremely important for them that their patients get to know in great detail what the whole process of getting treatments means from preparation to post-integration and follow up. One of the founders explains in-depth everything about the standards they set and how the whole procedure from donor selection, to donor care, patient treatment and follow up is done by the clinic. They begin by explaining that human stool contains mucus, undigested food, biliary waste, hormones, and epithelial cells from the donor. They consider that this kind of matter is completely unwelcome to a recipient.





One of the most impressive facts about Taymount Clinic is that they are the first ones in the world to be operating a 90-day+ quarantine system to hold back any donor material until two successive 3-monthly blood tests have been received. In this way, the stored implant material can be demonstrated to be free of latent or slow-to-show diseases such as HIV or hepatitis.

Another aspect that seems of significant importance for the clinic, is the fact that they maintain a long relationship with their donor group, which allows on-going continual testing of the same sources over a prolonged period. They also test their material with a molecular analysis called Polymerase Chain Reaction (PCR) on every single sample.

They do not just test their donors once and use them for a while following the tests, hoping that they are still in perfect condition until the next test. The clinic also developed the methods which they believe were based on standard undergraduate science-lab techniques of bacterial extraction, applied in this novel area.

They believe they were the first to develop the anaerobic approach to the processing, in order to preserve the anaerobic microbes, which make up 98% of the human stool by species and which are damaged by exposure to atmospheric oxygen.

They also consider themselves to be the first to focus on filtering out undigested food matter and to develop a method of extracting the living microbiome rather than delivering implants containing the whole stool matter.

The founders of Taymount clinic believe this is the highest standard of testing and delivering FMT. Furthermore, they assure this process is easy and can be effectively done.

They have also stated that they are pioneers in the technology of this treatment in Europe and that the work they have done has brought the attention of not only scientists but also patients from all over the world. Thousands of people have been searching for alternative and safe methods.

Medicine is the most strictly-regulated sector for unproven methods. For this reason, it is difficult to get access to real studies or papers related to success rates with FMT.



RATES OF SUCCESS

Medicine as we know it is the most strictly regulated sector when it comes to unproven methods. For this reason, it is difficult to get access to real studies or papers related to the success rates of FMT.

Most information from clinics indicates that they are not allowed to give information regarding their own statistics. Any data they may have is considered to be anecdotal as it has not been part of randomized, placebo-controlled, large-scale trials, and as such, is considered invalid by the medical community.

In this section, three of the most talked-about success rates with FMT will be discussed.

1) *Clostridium difficile*

Clostridium difficile (Heinlen & Ballard, 2010) is a bacterium found in water, soil, animal, and human feces. The common disease transmission is the fecal-oral route. This bacterium colonizes the large intestine in humans. It is estimated that about 500,000 cases of *C. difficile* occurred in the United States in 2011 resulting in 29,000 deaths (Alam & Mada, 2019). Once a person has been infected, there would be two types of patients. Healthy adults with a sufficient immune response become asymptomatic disease carriers. In other cases, diarrhea and colitis are the main symptoms.

The common treatment would be through antibiotics, which in turn also washes off all kind of 'good' bacteria populating the large intestine, making the patient prone not only to reinfection, but also a candidate to being sick or carrying other diseases a lot more often. FMT treatment is showing the most positive of all statistics in patients with *C. difficile* around the world in most clinics delivering FMT. It only makes sense that treating this specific type of colon infection with antibiotics would result in a weakened microbiome and/or severe dysbiosis. By repopulating the large intestine with a diverse range of healthy bacteria, one can expect the reestablishment of a healthy colon that can positively fight and prevent *C. difficile* from taking control and becoming a dominant organism.

2) Autism

Autism (Faras, Al Ateeqi & Tidmarsh, 2010) is one of a group of neurodevelopmental disorders, which are classified by the different levels of communication, reciprocal social interaction, and behavioral repetitive patterns prior to the age of 3. The exact cause of autism is still unknown, although it has been commonly believed that the cause may be found between genetic and cognitive characteristics.

The amazing and always surprising gut-brain connection means that the two 'brains' interact in complex and puzzling ways. Unusual states in the gut microbiome may lead individuals to neurodevelopmental disorders. At least that is what researchers of Arizona State University have come across after treating autism patients with FMT in their study called "Long-term the benefit of Microbiota Transfer Therapy in Autism Symptoms and Gut Microbiota" (Arizona State University, 2019).

Initially, researchers at Arizona State University noticed that most autism patients presented several gastrointestinal ailments. They found a very strong connection between the microbes that live in the gut and the signals that travel to the brain. Their study used the following approach: 10 weeks of treatment, including a bowel, cleanse, a stomach acid suppressant, and daily FMT for eight weeks. The result showed a 45% decrease in Autism Spectrum Disorder (ASD) symptoms.

3) Irritable Bowel Syndrome (IBS)

Irritable bowel syndrome (IBS) (Patel & Shackelford, 2020) is a condition affecting about 15% of the world's population with a series of symptoms including mainly abdominal pain, changes in the pattern of bowel movements, gas, bloating, food intolerances, and leaky gut. IBS also affects the quality of life of the host, resulting in mood swings, chronic fatigue, insomnia, anxiety, and depression. The cause of this condition is not fully understood, although it is believed that severe microbiota dysbiosis, small intestine bacterial overgrowth (SIBO), fungus, parasites, and stress might all be directly linked in most cases.

A study (El-Salhy, Hausken & Hatlebakk, 2019) shows that several IBS patients reported significant positive outcomes after repetitive FMT treatment; including improvement of abdominal pain, abdominal distension, bowel habits, and reduced interference with quality of life.



The author of this paper had lived with IBS for most of her life and went through several tests and treatments in hopes of finding a way to live in harmony with such conditions. One of her approaches included FMT at Taymount clinic in the UK. She reports very positive results with the 10-day treatment offered by the clinic, but it is very important to highlight that due to the complexity of this disease, it would be very difficult to assess how much of the disease can be actually alleviated with FMT. Could this be a disease that has more to do with the nervous system and trauma? Would there be a possibility that IBS is nothing but anxiety in the GI tract? What chances are there to find out in the future if the brain is affecting the condition of the gut and not always the gut affecting the brain. There is no medical proof of what could be affected first, or how to determine for each patient whether the brain or the gut started such condition.

POTENTIAL RISKS & SIDE EFFECTS

In 2019 the U.S. Food & Drug Administration (FDA) (McSeveney, 2019) has warned about potential risks linked to the use of FMT. Firstly, because this treatment has not yet been approved by them. Secondly, due to the potential risk of significant life-threatening infections linked to the transmission of multi-drug resistant organisms (MDROs).

The FDA reports that two patients treated with infected FMT samples had severe complications with undetected MDROs, resulting in the death of one of the patients. After this unfortunate event, the FDA requested stool testing protection for all clinics using this method as investigational research. Meanwhile, in the rest of the world, no mandatory standards have been set for donor screening or patients receiving stool transplantation.

With the intention of having a glimpse of possible risks and side effects, the results of a study will be discussed briefly.. These results reveal complications that could eventually show up after FMT treatment and they are considered 'individual cases'. In this study (Stallmach, Steube, Grunert, Hartmann, Biehl & Vehreschild, 2020) some patients showed symptoms including diarrhea, gas, bloating, abdominal pain, and a sensation of fullness after receiving a transplant. Serious unfavorable effects increased to 6.1% in patients receiving stool transplants via endoscopic procedures. Infection rates account for 2.5%. However, it is not confirmed whether the pathogens were acquired via FMT. It has been reported that a case of aspiration pneumonia arose after transplantation via endoscopy and the patient died 48 hours later of E. coli sepsis. In a different case, a patient that received FMT percutaneously later developed toxic megacolon and underwent an emergency colectomy. Unfortunately, this patient died a few days after surgery.

CONCLUSION

Scientists are working on the definition of a healthy microbiome. As of today, it is just not feasible to set parameters and classify the microbiome into categories. A variety of questions arise when studying this subject, for example: is it only the strain of bacteria present that makes the biggest impact, or is it more important the amount of it, is its functionality or is it more significant to look at a person's geographical origin, in order to determine what the person's ancestors could have had present in their microbiome? The microbiome is extremely puzzling and for the most part, it has just been recently studied. It is safe to say that an important side of it will remain a mystery due to its complexity. Consequently, one cannot deny the need for unconventional approaches to the improvement of health, especially if certain non-approved methods are showing success, such as FMT has shown with its undeniable effectiveness. Nonetheless, it is still considered a method that comes with uncertainty due to the limited amount of research and medical regulation.

Uncertainty will probably remain in this medical field. Researchers still question whether this treatment might increase the chance of contracting illnesses that could be unexpectedly linked to the microbiome but have not yet been developed in the donor. It would be more expedite and safer for patients to have access to clinics that are working on the improvement and reliability of FMT. Specifically in relation to donor examination, material protocols and all measurements presented for example by clinics like Taymount Clinic. In an ideal scenario, it would be of absolute necessity, regulating all clinics and practitioners to standards including a proper quarantine protocol of 90+ days to determine whether or not a donor's material is safe to use after successfully going through a thorough examination to determine if there could be slow-to-show diseases such as HIV, hepatitis or any kind of MDROs. Hopes for the involvement of more doctors and scientists, curiosity, and proper regulation are our best friends now. The journey to self-healing is extremely intimate and personal.

"When allopathy fails to show solutions for a specific disease, then all roads shall be seen as valid."

REFERENCES

- Earl, A. M., Losick, R. & Kolter, R. (2008, May 28). Ecology and genomics of *Bacillus subtilis*. Retrieved April 18, 2020 from <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2819312/>
- Frissen, M. N., de Groot, P. F., de Clercq, N. C. & Nieuwdorp, M. (2017, March 3). Fecal microbiota transplantation in metabolic syndrome: History, present and future. Retrieved April 25, 2020 from <https://www.tandfonline.com/doi/full/10.1080/19490976.2017.1293224>
- DePeters, E. J. & George, L. W. (2014, September 26). Rumen transfaunation. Retrieved April 24, 2020 from <https://www.ncbi.nlm.nih.gov/pubmed/25262872>
- Van Loon, G. (2002, 2003). Charaka Samhita, Handbook on Ayurveda, Volume I. Retrieved April 27, 2020 from [https://yousigma.com/biographies/Charaka%20Samhita%20\(Acharya%20Charaka\).pdf](https://yousigma.com/biographies/Charaka%20Samhita%20(Acharya%20Charaka).pdf)
- Shi, Y.-C. & Yang, Y.-S. (2018, July 30). Fecal microbiota transplantation: Current status and challenges in China. Retrieved April 19, 2020 from <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6152466/>
- Choi, H. H. & Cho, Y.-S. (2016, March 9). Fecal Microbiota Transplantation: Current Applications, Effectiveness, and Future Perspectives. Retrieved April 23, 2020 from <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4895930/>
- Heinlen, L. & Ballard, J. D. (2010, September). *Clostridium difficile* Infection. Retrieved April 20, 2020 from <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2935936/>
- Mada, P. K. & Alam, M. U. (2019, June 4). *Clostridium Difficile*. Retrieved April 29, 2020 from <https://www.ncbi.nlm.nih.gov/books/NBK431054/>
- Faras, H., Al Ateeqi, N. & Tidmarsh, L. (2010, July, August). Autism spectrum disorders. Retrieved April 22, 2020 from <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2931781/>
- Arizona State University. (2019, April 9). Autism symptoms reduced nearly 50 percent two years after fecal transplant. Science Daily. Retrieved April 25, 2020 from www.sciencedaily.com/releases/2019/04/190409093725.htm
- Patel, N., Shackelford, K. (2020). Irritable Bowel Syndrome. Retrieved April 28, 2020 from <https://www.ncbi.nlm.nih.gov/books/NBK534810/>
- El-Salhy, M., Hausken, T. & Hatlebakk, J. G. (2019, June 24). Increasing the Dose and/or Repeating Faecal Microbiota Transplantation (FMT) Increases the Response in Patients with Irritable Bowel Syndrome (IBS). Retrieved April 23, 2020 from <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6628324/>
- McSeveney, M. (2019, June 13). FDA In Brief: FDA warns about potential risk of serious infections caused by multi-drug resistant organisms related to the investigational use of Fecal Microbiota for Transplantation. Retrieved April 27, 2020 from <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6628324/>
- Stallmach, A., Steube, A., Grunert, P., Hartmann, M., Biehl, L. M. & Maria J. G. T. Vehreschild, M. J. G. T. (2020, January 17). Fecal Microbiota Transfer. Retrieved April 23, 2020 from <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7026570/>



FMT HAS BEEN USED TO SUCCESSFULLY TREAT RECURRENT CLOSTRIDIUM DIFFICILE INFECTION. THERE ARE PRELIMINARY INDICATIONS TO SUGGEST THAT IT MAY ALSO CARRY THE THERAPEUTIC POTENTIAL FOR OTHER CONDITIONS SUCH AS INFLAMMATORY BOWEL DISEASE, OBESITY, METABOLIC SYNDROME, AND FUNCTIONAL GASTROINTESTINAL DISORDERS.

There has been increasing interest in understanding the role of the human gut microbiome to elucidate the therapeutic potential of its manipulation.

CONSTIPATION & CHIROPRACTIC

Is There A Relationship?

BY DR. EMMA STIRTON

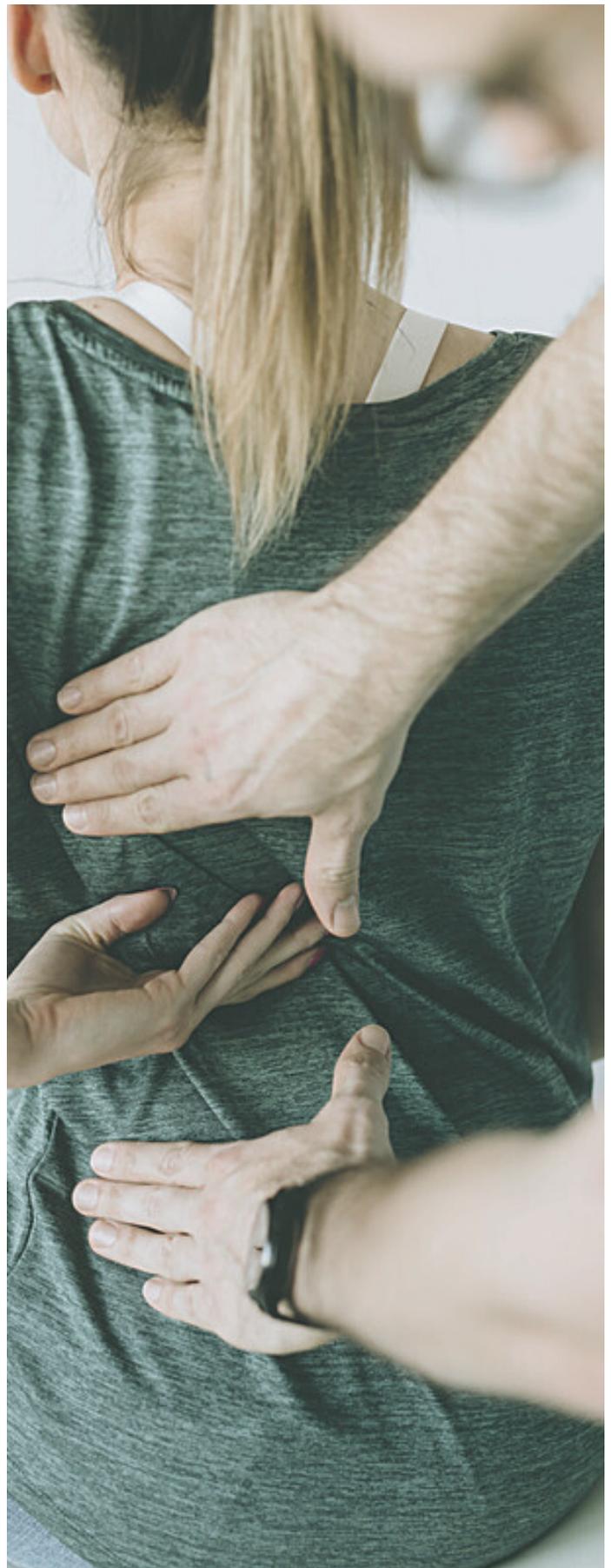
If you are like most people you might think chiropractic is about treating back and neck pain. This might have you conflicted in building a link between how chiropractic care can have anything to do with constipation and its relief. How does adjusting the spine affect the bowel? Is there really a relationship between chiropractic care and the ability to poop?

This paper is here to excite the idea of relieving constipation and widen the view on chiropractic care as a health modality. Constipation is widely accepted in medicine as a constellation of symptoms rather than a disease itself. It is diagnosed when the bowels move less than three times per week and have difficulty in passing the stool (Beck, 2008).

Bowel movements are considered normal in the medical community if one is moving the bowels more than 3 times per week and up to three times per day (Fleming and Wade, 2010).

The large intestine, part of the digestive system, has simple mechanistic functions to take food in and excrete waste. The frequency of taking in food should equal the frequency of excreting the foods' waste products. Essentially the digestive system can be likened to a pipe, and when something enters a full pipe at one end, something is required to leave the pipe at the other end to make space. This is evident in physics phenomena when looking at pressure, specifically 'overpressure,' and how it is released (Lotha, 2019).

This elementary analogy is not disregarding the vast complexities of the digestive system. Rather it is highlighting that if one is not excreting waste at a frequency they are taking in food, which turns to waste, constipation may need to be redefined. This is especially important when you understand only 30% of the bowel movement is made up of food waste, the rest is your body's toxic load looking for an escape (Nirala, 2015). If bowel movements are not occurring each time a meal is eaten the bowels are undeniably going to become constipated. But what if you don't feel constipated?



After discussion with hundreds of patients, it has become evident there are two types of constipation; the first is that where the person 'feels' constipated.

The feeling of constipation usually coincides with symptoms such as incomplete emptying, straining when defecating and pain in the lower abdomen along with long periods of time between bowel movements for example. The other form of constipation, and the more prevalently discussed, is constipation that is not felt. This is defined when the bowel is moving less than the consumption of each meal. Most patients are not moving their bowels at this frequency.

Constipation; known or unknown to the individual down-regulates one's ability to function at their height of health (Bharucha, Pemberton, and Locke, 2013). If constipation is not neurologically recognized via feedback loops in the body, it is at a much higher state of dysfunction, and as such can lead to chronic constipation (Gershon, 1999). This fact should sound scarier to you than knowing full well you are constipated. After all problem well stated, as we know is a problem half solved. So why is your brain not getting the message you are constipated? Well this is where chiropractic comes in.

Chiropractic is an alternative form of health care, but not alternative medicine described by government authorities such as, 'complementary and alternative medicine,' that umbrella's modalities such as massage homeopathy and naturopathy, but the alternative in a way that requires a paradigm shift on health its origin and what it means to be truly healthy.

Chiropractic is built upon the fact that the body self heals, self regulates, and self coordinates, and doesn't need any help to do so, no tinctures or teas or alternative medicine (Farrant, 2014).

Chiropractic understands one does not need to put anything into the system, nor does it need to take anything out to become healthy. To function at optimal, however, the body requires no interference in the way it connects with itself neurologically (Judson, 2018).

Any interference within the human existence down-regulates optimal function and impairs your ability to live with full vitality (Barham-Floreni, 2009). The interference of vital life force comes in the form of neurological dysfunction between your brain, spinal cord, and body (Moore, 2011).

Chiropractors have a deep understanding of neurology, brain plasticity, and how the spinal columns' structure directly affects the brain function and intern overall human function (Farrant, 2007).

The spine connects the brain to the body via the spinal cord. If spinal segments are moving incorrectly, or not moving at all the brain does not have a correct map of what the body is doing (Haarvik, 2014). This is because the spinal cord is the link of sensory information between the brain and the body. It requires unencumbered spinal movement to accurately send messages back and forth to the brain (Marshall and Murphy, 2006). When the brain does not receive the information correctly, it will fill in the blanks and thus build its own reality of what is going on in the systems of its' body (Haarvik, 2014). An excerpt from the book 'The Reality Check' depicts the brain's ability to fill in the blanks.

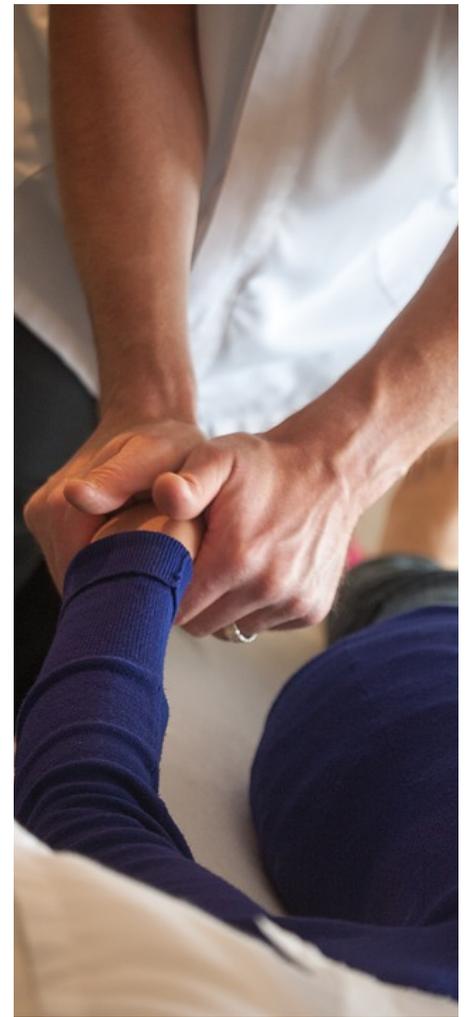
Try reading this:

"Ceoinsdr the power of the hman biran. It dseno't metatr in waht oredr the lrttees in a wrod are, the olny tihng taht is iproamtnt is the frsrit and lsat ltetres are in the rghit pclae. The rset can be a tatol mses and you can sitll raed it."

Neurologists are beginning to understand the importance of such phenomena where the brain builds its' own reality. This reality is created with sensory input from the internal and external environments along with past experience and current expectations (Haarvik, 2014). If the sensory input from the internal environment is not transmitted correctly, however, this alters the current perceived reality of the brain. This transmission occurs via the nerve system. The dysfunction of the nerve system causing the brain to fill in the blank spots due to the dysfunction could be linked with the body's inability to excrete waste appropriately.

Neurological interference occurs as a result of the abnormal spinal function (Haavik and Murphy, 2012). The spine which is made up of 24 moveable bones called vertebra can become dysfunctional in its movement and cause an inability of the brain to adequately perceive functions of the body (Schübel and Nogrady, 2012). This dysfunction chiropractors term a chiropractic subluxation. It is important to note this dysfunction is neurological in nature which is different from a medical subluxation as there are no 'bones out of place' and therefore do not require muscle work to correct the disconnect rather specific chiropractic adjustments to affect the nerve system (Senzon, 2018).

Chiropractics' role is to remove neurological interference, and as such is concerned with the relationship between structure and function. How the human frame is structured, and the complexities of its functions are a direct result of each other (Farrent, 2007).



Structure can be depicted by the skeletal system, muscular system, and fascia system, for example, and the functions of the body, regulated completely by the brain and the nerve system, include breathing, digestion, circulation, information integration to name a few. The function of the large intestines is the interest of this paper.

The interference of the nerve system via the spine is not always 'felt' within the nociceptive, or pain pathways of the body (Haarvik 2014). This may be the link between constipation that is not experienced as symptoms but experienced only as a decrease in bowel movements relative to meals eaten.

The stimulation to write about this obscure connection between chiropractic and constipation came after numerous practice members shared their stories following chiropractic adjustments and significant bowel movements especially after their first few adjustments.

Many commented on their inconceivability of how much mass, dark black in colour and toxic in smell was released within hours after their adjustment. The other interesting subjective fact was they did not feel constipated in the first place. When speaking to other chiropractic doctors, and researching this topic it became clear there was a common link between having chiropractic care and clearing the bowels.

Recent clinical discussions with nine chiropractors highlighted there is more to the picture. Each chiropractor recounted many, many practice members that have informed a significant bowel release post chiropractic adjustment. This ranged from an extra bowel movement for that day to copious large dark foul-smelling bowel movements occurring throughout the day and into the night where the need to move the bowels has woken the individual to expel throughout the night. Fecal matter quality is of old matter that has been stored for long periods of time.

When speaking to other chiropractic doctors and researching this topic, it became clear there was a common link between having chiropractic care and clearing the bowels.

Many recounts of practice members had explained they did not feel constipated before the adjustment and moved their bowels at a frequency that was 'regular' for them. Regular ranged from twice a day to once every two days.

It can be said that allowing the correct connection of the bowel to the brain via chiropractic care will allow more appropriate bowel function. You will notice, however, there will be no statements made anywhere in this paper saying chiropractic treats constipation because chiropractic does not treat nor cure any disease, it simply takes the pressure off the master control center in the body, so it can heal itself. It works under the guidance of vitalistic philosophy looks to the cause of the symptomatic expression rather than treating disease (Farrent, 2007). When the nerve system is unencumbered the body will not only heal and regulate as it is designed to do but it will function at a frequency that is far beyond a concept of sickness verse health (Barham-Floreni, 2009). This correct nerve system connection is based on the relationship between structure and function. An example of the relationship between structure and function is forward head posture and its association to decrease in depth of breath and therefore cellular oxygenation (Han et al., 2016). Give it a try now. Move your head forward of neutral, hang out there for 2 minutes, and notice the change in your breath, then in your concentration. In such a small amount of time, your structure changes your function. Imagine this is going on in numerous areas within your body, imagine if it is occurring at the neural junctions between your brain and your bowel.

This example of a change in your spinal structure has the means to affect your body's function (Marshall and Murphy, 2006). With this concept in mind, it is very simple to apply how the bowels with a toxic build-up can be stimulated to work as they should after an adjustment if there has been an imbalance between the brain's communication to the bowel itself. A subluxation within the system distorts the brain's ability to know when the bowel needs evacuation, and as such does not stimulate motor output to expel its content.

This well-researched phenomenon is called sensorimotor integration (Haavik and Murphy, 2012). Each aspect of the human structure is represented in the brain (Bracci, et al, 2015). The brain understands how to run the body based on the nerve connection from the body area, in this case, the bowels, to the part of the brain that controls that system (Uthaihpup, et al, 2012).

If the messages from the bowel to the brain are disconnected - the sensors input, or from the brain to the body - motor output is not transmitting at 100% and the desired result will not occur appropriately, and as such the bowel can remain a place for pent up poop.

Sensorimotor integration has not been studied at large concerning the bowel, however, there have been numerous studies looking at chiropractic adjustments and their sensorimotor effects on areas of the system including muscular control and output of the limbs (Marshall and Murphy, 2006), cerebella function on motor output, showing a decrease in falls risk in the elderly (Daligadu et al., 2013) and a decrease blood pressure (Roffers et al., 2011). It would be interesting to have more research in this area.

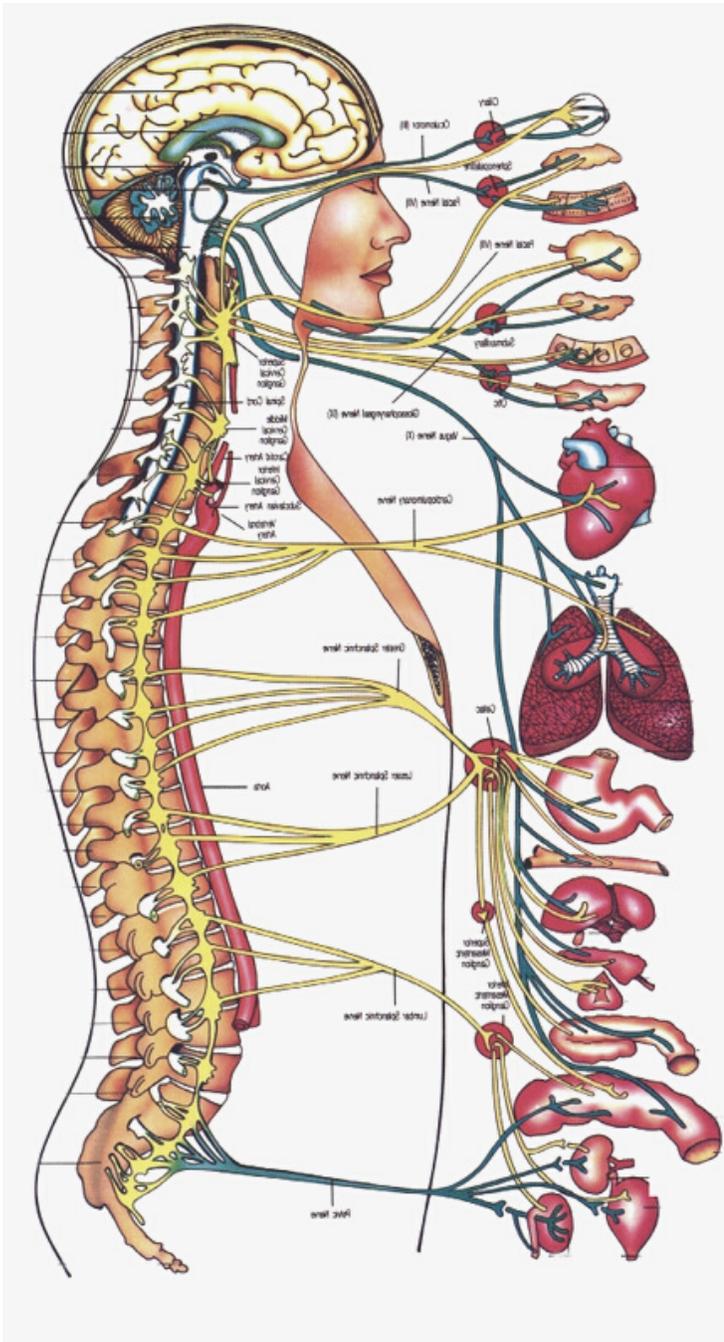
It is proposed by taking pressure off the nerve system there is a succession of hormonal and neural concussions that occur to induce the enteric nerve systems' increase in motility of the digestive system to produce a bowel movement or many. This however will be different in each person because the reason the subluxation occurred is very different in each individual. It may have been the connection to the liver, gall bladder, or small intestines for example.

For this paper, we will assume that the interference occurred at the level of the large intestines for ease's sake. It is important to understand, however, not all humans are the same and as such, the reason for clearing the bowels is different in all people. This is the case when interference to the body's vital functions that were down-regulated in the first place is different in individuals. The neural connection from the large intestines to the brain occurs through the autonomic nervous system.

The bowel is a perplexing organ with many controls. Ultimately it is dealt with via the enteric nervous system which has its own feedback loop. Connected through the spinal cord to the brain, it does not solely rely on this function (Gershon, 1999). Because of the enteric nervous system's own feedback loop, we can propose another reason for deep detoxification of the bowel post adjustment is due to the body's ability to move into a fitting autonomic state for its environment. If there has been a sympathetic dominance, calming down the nerve system, and moving into a parasympathetic state allows for bowel elimination.

Due to the fact it is possible to move into the parasympathetic state purely with breathwork, it is suggested there are complexities deeper that are not entirely understood that allow for bowel movements post chiropractic adjustments. More research is needed to understand the physiological functions.

It should be re-highlighted that two different forms of constipation are being addressed within this paper. The most widely accepted, constipation with signs and symptoms is shown in many scientific studies that have shown symptomatic relief post chiropractic adjustment (Quist and Duray, 2007),(Alcantara and Mayer, 2008),(Alcantara, 2014).



This begs the questions, due to the sensitivity of the topic, and societal taboo around poo, if this is occurring more frequently and practice members are not informing the chiropractor, or the chiropractor is not asking the question to form a link between adjustments. It also highlights the importance of a redefinition of constipation. Constipation in western medicine is termed as moving the bowels less than three times per week, however, this paper highlights constipation and bowel back up can occur in those that are moving their bowels once a day or more.

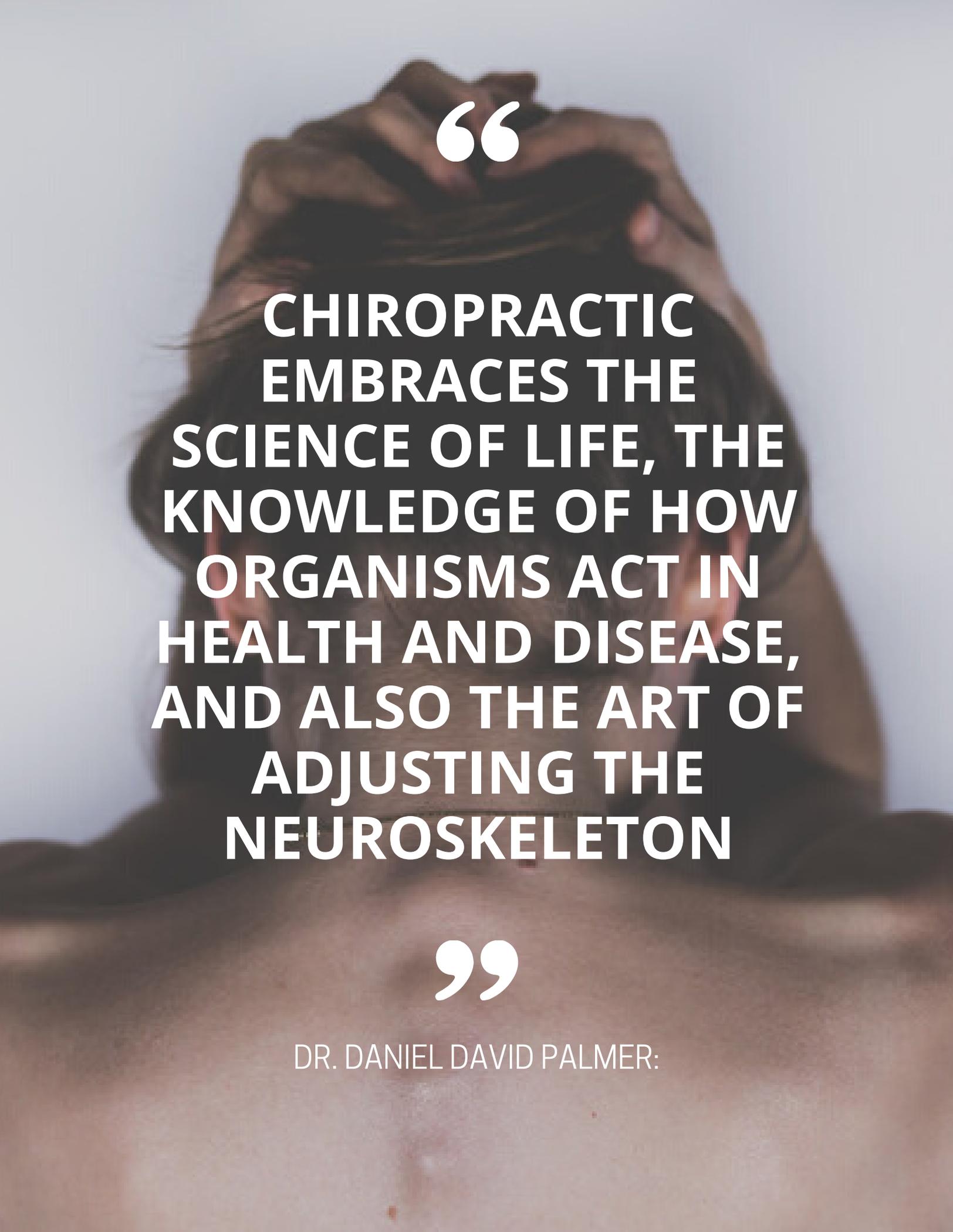
As previously mentioned this paper was never intended to draw a link between chiropractic and the potential for constipation cure. Firstly because chiropractic does not cure anything, the body does, but mostly because the relationship between chiropractic and constipation relief is no different from the relationship between chiropractic and any organ function. If there is a correct neural function to an end organ that organ is going to function as it should.

This paper was written to show the importance of a well functioning subluxation free nerve system. It is a birthright to live in a body that is neurologically unencumbered whereby self-healing, self coordinating self-regulating mechanisms are behaving at their height of capacity. This includes adequate regular peristaltic movements of the bowels resulting in the removal of waste from the large intestines. It is obvious that many individuals have found relief from constipation even when they did not realize there was a toxic backup. There is absolutely a link between chiropractic care and constipation relief. When the nerve system is free of interference and the spine is moving as it should, the bowels are stimulated to shift toxic bowel build up out of the body, as they are designed to.

Chiropractors are the only health care professionals specifically trained to locate analyze and correct areas of dysfunction within the nerve system.

Have you had your spine checked by your local chiropractor?

Write to us at info@instituteforalliveness.com or on IG [@instituteforalliveness](https://www.instagram.com/instituteforalliveness) and share your experience with Dr. Emma.

A photograph of a person's hands clasped behind their head, with the text overlaid. The background is a soft, out-of-focus light blue.

“

**CHIROPRACTIC
EMBRACES THE
SCIENCE OF LIFE, THE
KNOWLEDGE OF HOW
ORGANISMS ACT IN
HEALTH AND DISEASE,
AND ALSO THE ART OF
ADJUSTING THE
NEUROSKELETON**

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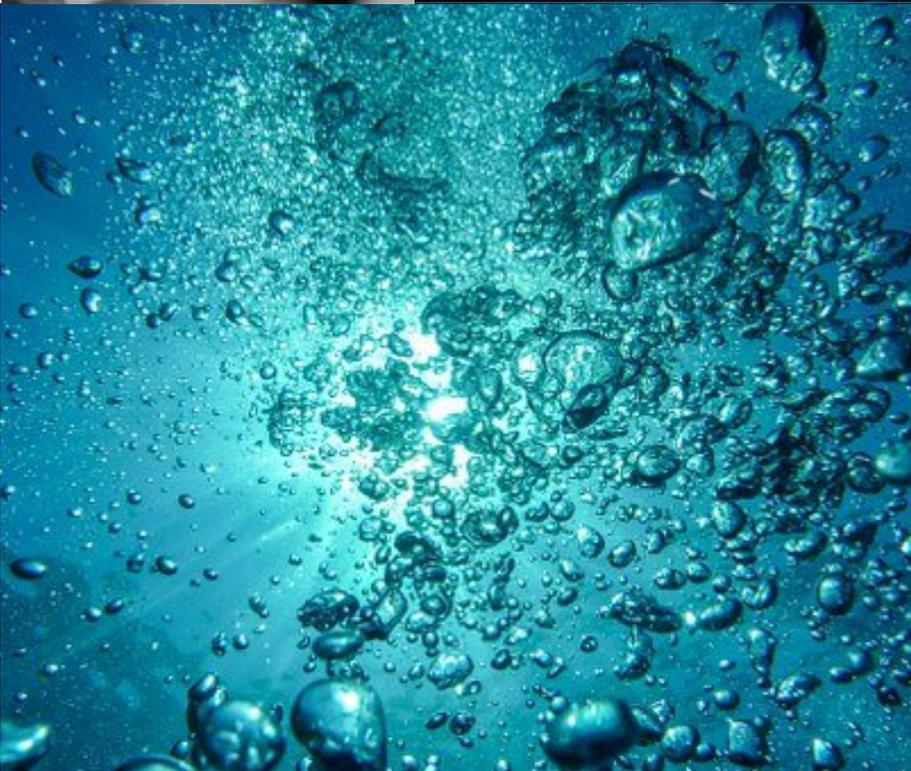
DR. DANIEL DAVID PALMER:

REFERENCES

- Alcantara, J. and Mayer, D., 2008. The Successful Chiropractic Care of Pediatric Patients with Chronic Constipation: A Case Series and Selective Review of the Literature. *Clinical Chiropractic*, 11(3), pp.138-147.
- Alcantara, J., Alcantara, J. and Alcantara, J., 2014. An Integrative Review of the Literature on the Chiropractic Care of Infants with Constipation. *Complementary Therapies in Clinical Practice*, 20(1), pp.32-36.
- Barham-Floreni, J., 2009. *Well Adjusted Babies*. [Melbourne, Vic.]: Vitality Productions.
- Bharucha, A., Pemberton, J. and Locke, G., 2013. American Gastroenterological Association Technical Review on Constipation. *Gastroenterology*, 144(1), pp.218-238.
- Beck, D., 2008. Evaluation and Management of Constipation. *Clinics in Colon and Rectal Surgery*, 18(02), pp.81-84.
- Bracci, S., Caramazza, A. and Peelen, M., 2015. Representational Similarity of Body Parts in Human Occipitotemporal Cortex. *Journal of Neuroscience*, 35(38), pp.12977-12985.
- Costandi, M., n.d. How To Optimise Your Brain's Waste Disposal System. [online] the Guardian. Available at: <<https://www.theguardian.com/science/neurophilosophy/2015/aug/22/how-to-optimize-your-brains-waste-disposal-system>> [Accessed 2 May 2020].
- Daligadu, J., Haavik, H., Yelder, P., Baarbe, J. and Murphy, B., 2013. Alterations in Cortical and Cerebellar Motor Processing in Subclinical Neck Pain Patients Following Spinal Manipulation. *Journal of Manipulative and Physiological Therapeutics*, 36(8), pp.527-537.
- Farrant, S., 2007. *The Vital Truth*. Vital Wellbeing Company Ltd.
- Farrant, S., 2014. *The Health Illusion*. Vital Wellbeing Ltd.
- Fleming, V. and Wade, W., 2010. A review of laxative therapies for treatment of chronic constipation in older adults. *The American Journal of Geriatric Pharmacotherapy*, 8(6), pp. 514-550.
- Gershon, M., 1999. *The Second Brain: A Groundbreaking Of Nervous Disorders Of The Stomach And Intestine*. New York, N.Y: HarperPerennial.
- Haavik, H., 2014. *The Reality Check*. Haavik Research.
- Haavik, H. and Murphy, B., 2012. The role of spinal manipulation in addressing disordered sensorimotor integration and altered motor control. *Journal of Electromyography and Kinesiology*, 22(5), pp.768-776.
- Han, J., Park, S., Kim, Y., Choi, Y. and Lyu, H., 2016. Effects of forward head posture on forced vital capacity and respiratory muscles activity. *Journal of Physical Therapy Science*, 28(1), pp. 128-131.
- Judson, S., 2018. *Wake Up, Humans!* 1st ed. USA.
- Lotha, G., 2019. Pressure | Definition, Measurement, & Types. [online] Encyclopedia Britannica. Available at: <<https://www.britannica.com/science/pressure>> [Accessed 2 May 2020].
- Marshall, P. and Murphy, B., 2006. The Effect of Sacroiliac Joint Manipulation on Feed-Forward Activation Times of the Deep Abdominal Musculature. *Journal of Manipulative and Physiological Therapeutics*, 29(3), pp.196-202.
- Moore, D., 2011. *The Chiropractic Evolution*. [Place of publication not identified]: David R. Moore, D.C.
- Nirala, S., 2015. Feces | Biology. [online] Encyclopedia Britannica. Available at: <<https://www.britannica.com/science/feces>> [Accessed 2 May 2020].
- Quist, D. and Duray, S., 2007. Resolution of Symptoms of Chronic Constipation in an 8-Year-Old Male After Chiropractic Treatment. *Journal of Manipulative and Physiological Therapeutics*, 30(1), pp.65-68.
- Roffers, S., Huber, L., Morris, D., Stiles, A., Barton, D. and House, T., 2011. A randomized controlled trial to measure the effects of specific thoracic chiropractic adjustments on blood pressure and pulse rate. *Clinical Chiropractic*, 14(4), pp.169-170.
- Senzon, S., 2018. The Chiropractic Vertebral Subluxation Part 7: Technics and Models From 1962 to 1980. *Journal of Chiropractic Humanities*, 25, pp.99-113.
- Schübel, L. and Nogrady, J., 2012. *Cast To Be Chiropractors*. United States: Nogrady Chiropractic.
- Uthakhip, S., Jull, G., Sungkarat, S. and Treleaven, J., 2012. The influence of neck pain on sensorimotor function in the elderly. *Archives of Gerontology and Geriatrics*, 55(3), pp.667-672.

HYPERBARIC OXYGEN THERAPY & ERADICATING PATHOGENIC BIOFILM

BY JACI TAYLOR



IS THERE MORE TO BREATHING THAN WE KNOW?

Oxygen is our primary source nutrient of life. Every cell in the human body uses oxygen to perform its function.

Every cell in our body, breathes. We inhale oxygen, nitrogen and carbon dioxide and we exhale these as well, but the quantity differs. We exhale less oxygen than we take in, because our body keeps most of it and uses that oxygen to feed our cells. At sea level, our oxygen intake is only 21% of the gases that we are breathing in. Our body thrives on oxygen to function.

Could there be a beneficial therapeutic effect in increasing the amount of oxygen concentration in the air we are breathing?

One of the ways developed that delivers more oxygen into the bloodstream and tissues is a method called hyperbaric oxygen therapy.

THE HISTORY OF OXYGEN THERAPY

Hyperbaric oxygen therapy was first discovered in 1662 by a British clergyman and physician called Nathaniel Henshaw. He believed that placing people under pressurized conditions would help the better function of the lungs and digestion. He created a chamber, which he called his 'Domicilium', and the air pressure was driven with organ bellows. At this time only the pressure within the chamber was a change, and no form of pure oxygen was used. Later, through the development of pressure chambers in assisting miners, divers, and tunnel construction workers to combat decompression sickness, hyperbaric started to include the addition of high concentrations of oxygen and medical applications began as early as the 1870s.

MODERN DAY

By the 1960's hyperbaric oxygen chambers were used in medicine, and today, there is an ever-expanding world of research on all the possible applications of hyperbaric oxygen therapy in a clinical setting.

Now, we are also able to extend inquiry into sub-clinical and proactive health care. This paper will be looking at how hyperbaric oxygen therapy is seen to eradicate inflammation-causing bacteria bodies called biofilm.

WHAT IS HYPERBARIC OXYGEN THERAPY?

Hyperbaric oxygen therapy (HBOT) is breathing 100% oxygen whilst under increased atmospheric pressure. Most commonly this is done within a chamber that looks like something from a space station. When a patient is given 100% oxygen under pressure, hemoglobin is saturated, but the blood can be hyper oxygenated by dissolving oxygen within the plasma.

WHAT DOES THIS MEAN?

WHY WOULD WE WANT THE OXYGEN TO DISSOLVE INTO THE PLASMA?

HOW DOES HBOT AFFECT THIS?

It is a normal function of the oxygenation in our bodies that the oxygen released from the hemoglobin dissolves into the plasma.

It is through the plasma that the oxygen molecule is delivered to the cells and tissues. The majority of oxygen in the blood is bound to hemoglobin, not dissolved (1). The hemoglobin must become relaxed in order to release the oxygen molecules bound to it. Most oxygen carried in the blood is bound to hemoglobin, which is 97% saturated at standard pressure. Some oxygen, however, is carried in solution (plasma), and this portion is increased under hyperbaric conditions. (2)

As hemoglobin releases more of its oxygen to become dissolved in plasma and oxygen from the plasma is being released to the tissues, in accordance with Henry's Law. Henry's law states that the amount of gas dissolved in a liquid is equal to the partial pressure of the gas exerted on the surface of the liquid. By increasing the atmospheric pressure within the hyperbaric chamber, more oxygen can be dissolved into the plasma than would be seen at surface pressure. (2)

Tissues at rest extract 5-6 mL of oxygen per deciliter of blood, assuming normal perfusion (2). Perfusion is the passage of fluid through the circulatory system or lymphatic system to an organ or tissue, usually referring to the delivery of blood to a capillary bed in tissue.

Administering 100% oxygen at hyperbaric pressure increases the amount of oxygen dissolved in the blood to 1.5 mL/dL. At 3 atmospheres, the dissolved-oxygen content is approximately 6 mL/dL, which is more than enough to meet resting cellular requirements without any contribution from hemoglobin (2).

Because the oxygen is in solution (plasma), it can reach areas where red blood cells may not be able to pass and can also provide tissue oxygenation in the setting of impaired hemoglobin concentration or function. (2)

The better oxygen saturation in the blood, the more oxygen is available to be carried through the plasma to the tissues. Having free oxygen carried with the plasma means there is an abundant supply to deliver oxygen molecules to aid the healing of disease or dysfunction in the body; essentially, upgrading health.

We learned that oxygen is a source nutrient for every cell in our body and so the greater the supply of oxygen, the greater the capacity for each cell to do all the functions it needs to do in order to heal and grow the body.



BENEFITS OF HBOT

Modern research into hyperbaric oxygen therapy spans over 40 years now and points to many benefits:

Dr. Shai Efrati tells us about many of the benefits of HBOT in his 2015 TedX presentation, 'Growing A New Tail - Hyperbaric Oxygen Therapy Stimulates Regenerative Cell Growth'.

According to his research, hyperbaric oxygen therapy has been seen to have the effects of;

- Stimulating the generation of omnipotent stem cells and increasing blood concentration of stem cells
- Angiogenesis growing new blood vessels
- Collagen synthesis of fibroblasts and osteoblasts which supports bone density

- Increases energy
 - Improves cognitive + motor function (3)
- In his book, 'Oxygen Under Pressure: Using Hyperbaric Oxygen Therapy To Restore Health, Reduce Inflammation, Reverse Aging and Revolutionize Health Care', Dr. Jason Sonners presents chapters that cover the benefits of HBOT; expanding on Dr. Efrati's research.

- post-surgical recovery
- killing bacteria
- ATP production - mitochondria - doubling/tripling mitochondrial content, efficiency, size and density
- white blood cell activation
- balancing bacteria in microbiome
- antimicrobial
- activates parasympathetic function
- mends epigenetic stressors

- mild oxidative stress (via pressurised environment) stimulates body's response to stress
- reduce inflammation - research can found related to effects with Crohn's, MS, arthritis
- improves ability to detoxify
- anti-aging
- heals small wounds - halting initiation of chronic inflammatory cycle
- improves O2 absorption and concentration and CO2 elimination
- upregulation in immune system function
- repair of damaged nerves in the case of neurological conditions - Parkinson's, TBI, concussion
- stimulates growth factors
- removal of metabolic byproducts that build up in within the tissues
- helps to break down biofilm (4)

As we can see, some things that get in the way of the body healing itself are any form of inflammation, stress, toxicity, trauma, delayed healing or chronic disease of the gastrointestinal system.

HBOT is known to possess anti-inflammatory properties [5,6] and can decrease both neuroinflammation [7] and gastrointestinal inflammation [8,9] Biofilm is something that causes blockages in the body's healing process and it has been a culprit in numerous human diseases, including the aforementioned states.

As research has progressed over the years, biofilms — bacterial and fungal — have been implicated in a variety of health conditions. In a 2002 call for grant applications, the National Institutes of Health (NIH) noted that biofilms accounted "for over 80 percent of microbial infections in the body." (10)

WHAT IS BIOFILM?

Biofilms are microbial communities consisting of bacteria, extremely capable of self-reproducing on biological surfaces, causing infections. Frequently, these biofilms are resistant to classical antibacterial treatments and the body's own immune response. The reason for this is because they are highly structured, three-dimensional microbial aggregates embedded in a self-produced, extracellular matrix. This means that the structure surrounding the bacteria is an impenetrable skin housing the bacterial community inside and protecting it from disruption. 60-90% of chronic wounds contain biofilm-forming bacteria (11).

Biofilms attach to the surface and stick together, exchanging nutrients (12) between one another.

They are independent of the environment in which they are in and, because of this, cause disruption of messages from synergistic body systems, allowing inflammation to form and even perpetuate.

Organisms in the biofilm become more resistant than planktonic bacteria: bacteria that is free floating in the body without the encapsulation of a biofilm, to physical and chemical attacks, such as by chemotherapeutic agents. Chemotherapeutic agents, also referred to as anti-neoplastic agents, are used to directly or indirectly inhibit the proliferation of rapidly growing cells, typically in the context of malignancy.

The biofilm are considered anaerobic which means they do not require oxygen to survive. In fact, anaerobes may react negatively or even die if free oxygen is present.

BIOFILM RESEARCH

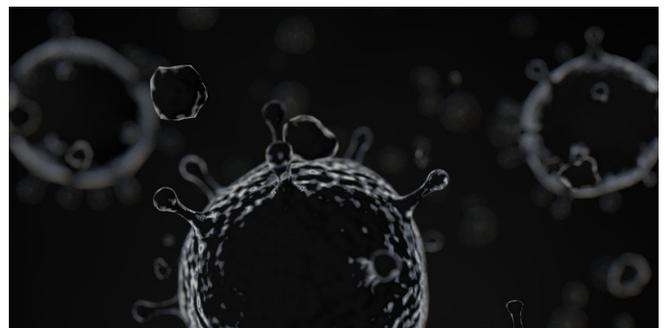
Bill Costerton (1934-2012) is recognized as the founding father of the field of biofilms, which is the study of microorganisms attached to surfaces. He was a true pioneer and was passionate about directly observing living complex microbial communities to learn how they function in different ecosystems. His multidisciplinary approach to the study of biofilms forged a common way of thinking about the ways in which microorganisms survive and function in the environment as well as in medical, dental, industrial, agricultural, engineering and other contexts. (13)

Bill received his Ph.D. in Bacteriology from the University of Western Ontario, Canada, in 1960. After taking part in missionary work in India, during which he established a pre-medical school, Bill undertook a postdoctoral fellowship at the University of Cambridge, UK, before moving to McGill University, Montreal, Canada, in 1968, where he began work on bacterial cell wall ultrastructure. (13)

Over the course of his career, Bill Costerton paved the way for biofilm to be understood, was involved in paradigm-shifting research into how biofilm can be beneficial in waste management, and where, in the human body, it causes major disruption to the body's healing mechanisms. He spent his career pushing the boundaries and is a key player in how we understand biofilm today.

THE BIOFILM DISCOVERIES

He noted that bacteria were attached to the gut or to cellulose fibres via a complex matrix. (14) Biofilms were only partially controlled by antimicrobial agents (15-18) and that concentrations that controlled planktonic cells were not effective when the same organisms were grown on a surface (19,20). These important observations led to the emergence of a specific research area studying antimicrobial resistance in biofilms. Biofilms are increasingly considered to be vehicles for the increased transfer of antibiotic resistance plasmids. (21) A plasmid is a small, circular, double-stranded DNA molecule that is distinct from a cell's chromosomal DNA. Plasmids naturally exist in bacterial cells, and they also occur in some eukaryotes. Often, the genes carried in plasmids provide bacteria with genetic advantages, such as antibiotic resistance.



Recent studies that compared standard filter mating and biofilm conditions indicated that growth as a biofilm increases the transfer of antibiotic resistance plasmids and the emergence of resistance mutations in *Staphylococcus aureus* (21).

Costerton had the increasing conviction that biofilm attachment to native tissue and medical devices could explain the recalcitrance of many chronic infections to antibiotic therapy. He used research to image an enormous variety of surfaces and samples for evidence of biofilms. (13) The clinical samples that were analyzed included the post-mortem Cystic Fibrosis lung (22), the urogenital tract (23-25), orthopedic samples (26,27), peritoneal dialysis catheters (28), intravenous catheters (29), ventricular shunts (30), and endotracheal tubes (31). These images revealed details that have subsequently been recognized as hallmark features of biofilm infections, including the restricted penetration of antibodies and phagocytic cells into biofilms.

Using the images, Bill could tell the vivid story of biofilms and reveal for the first time a new world, in which bacteria could be physically interconnected, close enough for signal-based communication, and arranged in structures that were optimized for nutrient exchange and that protected the residents from antibiotics and host immunity. (13)

Today, the cystic fibrosis (CF) lung; listed above, is used as a well-studied example of the deadly consequences of the biofilm phenotype in infectious diseases. (13)

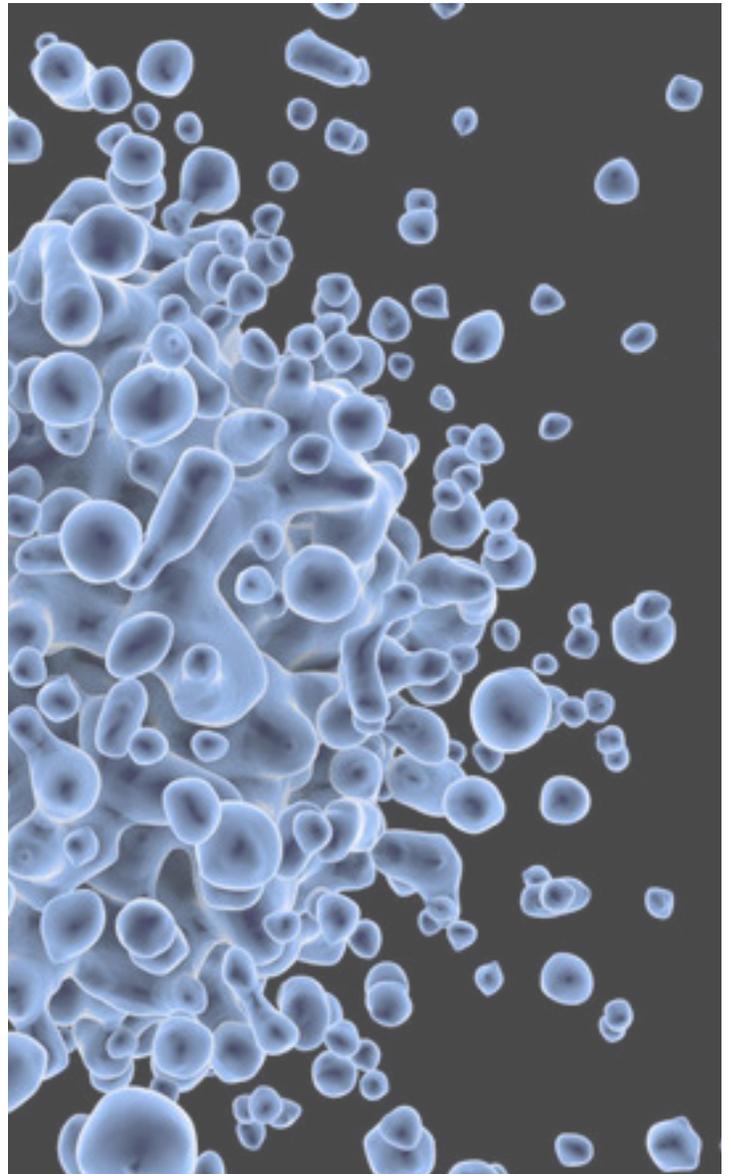
WHAT DOES THIS ALL MEAN?

Essentially, it means that because the biofilm is independent of the environment in which they are in and can communicate amongst themselves, they can form and grow bacteria without the threat of easy destruction by the body's immune system. In the case of biofilm containing pathogenic bacteria, this is a pretty serious issue.

All in all, Bill Costerton's career work forms the integral building blocks of the comprehension that pathogenic biofilm needs to be dealt with at all levels of health from preventative health to medical intervention in response to chronic disease.

WHERE DOES HBOT COME IN?

Remember how we learned that the bacterial community within a biofilm is anaerobic - meaning it doesn't require oxygen to thrive? HBOT is particularly effective against anaerobes and facilitates the oxygen-dependent peroxidase system by which leukocytes kill bacteria. (2) Peroxidase is an enzyme found in a wide variety of organisms, from plants to humans to bacteria.



Its function is to break down hydrogen peroxide (H₂O₂), which is one of the toxins produced as a byproduct of using oxygen for respiration. Leukocytes are part of the body's immune system. They help the body fight infection and other diseases. HBOT increases the generation of oxygen free radicals, which oxidize proteins and membrane lipids, damage DNA, and inhibit bacterial metabolic functions. (2)

The efficacy of HBOT against biofilm infections has been evaluated using in vitro and in vivo platforms. In one study, polymicrobial fully-formed biofilms (*P. aeruginosa*, *S. aureus*, and *E. faecalis*) were subject to HBOT at 30 min intervals. Results revealed small but significant decreases in cell viability at 60 and 90 min intervals; however, a rebound in overall cell viability in the control and treated groups was seen at 90 min. Using 16S rDNA sequencing, marked changes in species composition were observed during the duration of HBOT applications.

This indicates complete disruption and reorganization of the biofilm community, leading to greater microbial diversity and possibly better responses to treatment. (32)

I'll say that again:

This indicates complete disruption and reorganization of the biofilm community, leading to greater microbial diversity and possibly better responses to treatment.

COULD IT REALLY BE AS EASY AS BREATHING?

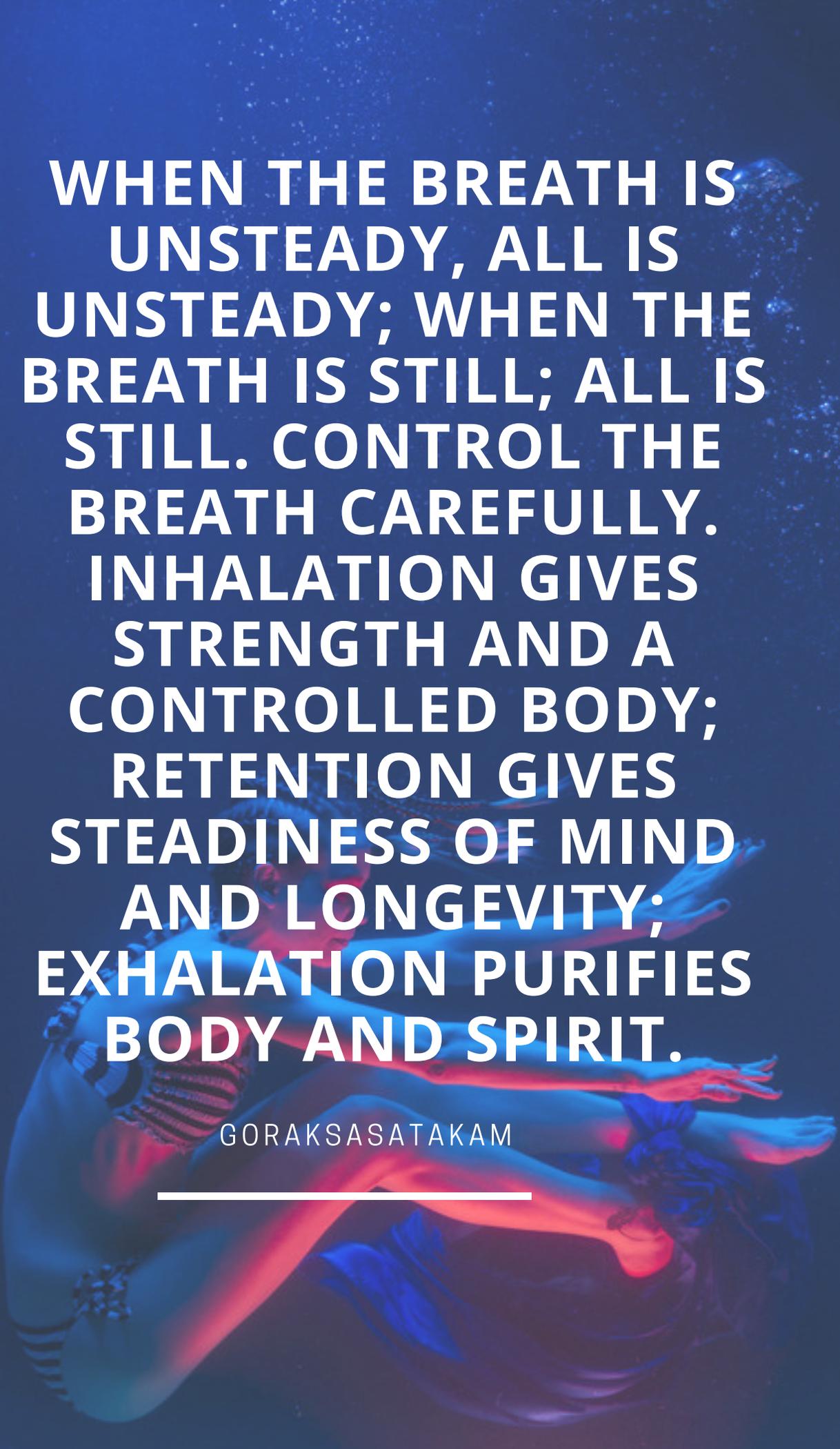
WHAT NOW?

Outside of a hospital and clinical setting the hyperbaric chambers available for wellness centers or to install at home are approved to hold 1.5-1.7 atmospheres absolute (ATA). This still provides substantial benefits and because it is easier to access, can be used for proactive solutions to health and wellness. How we understand the management of good dental hygiene is to regularly clean and floss our teeth and to have regular checkups with our dentist to avoid the build-up of dental plaque.

What if, just like cleaning our teeth of plaque, we could use hyperbaric oxygen therapy to create a cleaner environment in our bodies where biofilm cannot thrive? A proactive approach to this may be developing a hyperbaric oxygen protocol and management plan so we can better maintain our optimal health and prevent the disruption to vitality by pathogens housed inside our bodies.

REFERENCES

- (1) Chapter 1 – Dissolved Oxygen in the Blood - Daniel Saddawi-Konefka and Ben Bryner <http://www.umich.edu/~projbnb/cvr/O2transport.pdf>
- (2) Hyperbaric Oxygen Therapy - Emi Latham, MD, FACEP, FAAEM, UHM Assistant Clinical Professor of Emergency Medicine, Hyperbaric Medicine Physician, University of California, San Diego, School of Medicine 2018.
- (3) Dr. Shai Efrati 'Growing A New Tail - Hyperbaric Oxygen Therapy Stimulates Regenerative Cell Growth'
- (4) Dr. Jason Sonners 'Oxygen Under Pressure: Using Hyperbaric Oxygen Therapy To Restore Health, Reduce Inflammation, Reverse Aging and Revolutionize Health Care'.
- (4) "Effect of Age and Repeated Hyperbaric Oxygen Treatments on Vagal Tone." V.E. LUND1 , E. KENTALA 1, H. SCHEININ2 , K. LERTOLA3, J. KLOSSNER, K. AITASALO4, K. SARIOLA-HEINONEN1, J. JALONEN11 Dept. of Anesthesiology and Intensive Care, Turku University Hospital, 2 Turku PET Centre and Department of Pharmacology and Clinical Pharmacology, University of Turku, 3 Dept. of Statistics, University of Turku, 4 Dept. of Oto-Rhino-Laryngology, Turku University Hospital, Turku, Finland 2005
- (5) 43 - Sumen G, Cimsit M, Eroglu L. Hyperbaric oxygen treatment reduces carrageenan-induced acute inflammation in rats. *Eur J Pharmacol.* 2001;431:265–268. doi:10.1016/S0014-2999(01)01446-7.[PubMed] [CrossRef] [Google Scholar]
- (6) - Al-Waili NS, Butler GJ. Effects of hyperbaric oxygen on inflammatory response to wound and trauma: possible mechanism of action. *ScientificWorldJournal.* 2006;6:425–441. doi: 10.1100/tsw.2006.78. [PMC free article] [PubMed] [CrossRef] [Google Scholar]
- (7) - Vlodavsky E, Palzur E, Soustiel JF. Hyperbaric oxygen therapy reduces neuroinflammation and expression of matrix metalloproteinase-9 in the rat model of traumatic brain injury. *Neuropathol Appl Neurobiol.* 2006;32:40–50. doi: 10.1111/j.1365-2990.2005.00698.x. [PubMed] [CrossRef] [Google Scholar]
- (8) 46 - Takeshima F, Makiyama K, Doi T. Hyperbaric oxygen as adjunct therapy for Crohn's intractable enteric ulcer. *Am J Gastroenterol.* 1999;94:3374–3375. doi: 10.1111/j.1572-0241.1999.03374.x.[PubMed] [CrossRef] [Google Scholar]
- (9) 47 - Buchman AL, Fife C, Torres C, Smith L, Aristizabal J. Hyperbaric oxygen therapy for severe ulcerative colitis. *J Clin Gastroenterol.* 2001;33:337–339. doi:10.1097/00004836-200110000-00018.[PubMed] [CrossRef] [Google Scholar]
- (10) <https://grants.nih.gov/grants/guide/pa-files/PA-03-047.html>
- (11) Recent Advances in Non-Conventional Antimicrobial Approaches for Chronic Wound Biofilms: Have We Found the 'Chink in the Armor'? Snehal Kadam,1 Saptarsi Shai,2 Aditi Shahane,2 and Karishma S Kaushik1 2019
- (12) Khan Academy - Prokaryote Interactions & Ecology
- (13) Revealing a world of biofilms - the pioneering research of Bill Costerton Article in Nature Reviews Microbiology · August 2014 DOI: 10.1038/nrmicro3343 · Source: PubMed
- (14) Cheng, K. J., Akin, D. E. & Costerton, J. W. Rumen bacteria: interaction with particulate dietary components and response to dietary variation. *Fed. Proc.* 36, 193–197 (1977).
- (15) Costerton, J. W. in *Action of Antibiotics in Patients.* 160–176 (Hans Huber, 1982).
- (16) Costerton, J. W. The formation of biocide-resistant biofilms in industrial, natural, and medical systems. *Devel. Indust. Microbiol.* 25, 363–372 (1984).
- (17) Jass, J., Costerton, J. W. & Lappin-Scott, H. M. The effect of electrical currents and tobramycin on *Pseudomonas aeruginosa* biofilms. *J. Ind. Microbiol.* 15, 234–242 (1995).
- (18) Jones, S. M., Morgan, M., Humphry, T. J. & Lappin-Scott, H. Effect of vancomycin and rifampicin on methicillin-resistant *Staphylococcus aureus* biofilms. *Lancet* 357, 40–41 (2001).
- (19) 27. Nickel, J. C., Ruseska, I., Wright, J. B. & Costerton, J. W. Tobramycin resistance of *Pseudomonas aeruginosa* cells growing as a biofilm on urinary catheter material. *Antimicrob. Agents Chemother.* 27, 619–624 (1985).
- (20) 28. Mayberry-Carson, K. J., Tober-Meyer, B., Lambe, D. W. Jr & Costerton, J. W. An electron microscopic study of the effect of clindamycin therapy on bacterial adherence and glycocalyx formation in experimental *Staphylococcus aureus* osteomyelitis. *Microbios* 48, 189–206 (1986).
- (21) Savage, V. J., Chopra, I. & O'Neill, A. J. *Staphylococcus aureus* biofilms promote horizontal transfer of antibiotic resistance. *Antimicrob. Agents Chemother.* 57, 1968–1970 (2013).
- (22) Lam, J., Chan, R., Lam, K. & Costerton, J. W. Production of mucoid microcolonies by *Pseudomonas aeruginosa* within infected lungs in cystic fibrosis. *Infect. Immun.* 28, 546–556 (1980).
- (23) Marrie, T. J. & Costerton, J. W. A scanning and transmission electron microscopic study of the surfaces of intrauterine contraceptive devices. *Am. J. Obstet. Gynecol.* 146, 384–394 (1983).
- (24) Marrie, T. J., Lam, J. & Costerton, J. W. Bacterial adhesion to uroepithelial cells: a morphologic study. *J. Infect. Dis.* 142, 239–246 (1980).
- (25) Nickel, J. C., Gristina, A. G. & Costerton, J. W. Electron microscopic study of an infected Foley catheter. *Can. J. Surg.* 28, 50–51 (1985).
- (26) Gristina, A. G. & Costerton, J. W. Bacterial adherence and the glycocalyx and their role in musculoskeletal infection. *Orthop. Clin. North Am.* 15, 517–535 (1984).
- (27) Gristina, A. G. & Costerton, J. W. Bacterial adherence to biomaterials and tissue. The significance of its role in clinical sepsis. *J. Bone Joint Surg. Am.* 67, 264–273 (1985).
- (28) Dasgupta, M. K. et al. Biofilm producing adherent bacterial microcolonies in peritonitis associated with chronic ambulatory peritoneal-dialysis (capd). *Kidney International* 29, 230 (1986).
- (29) Tchekmedyan, N. S. et al. Special studies of the Hickman catheter of a patient with recurrent bacteremia and candidemia. *Am. J. Med. Sci.* 291, 419–424 (1986).
- (30) Walsh, T. J., Schlegel, R., Moody, M. M., Costerton, J. W. & Salzman, M. Ventriculoatrial shunt infection due to *Cryptococcus neoformans* — an ultrastructural and quantitative microbiological study. *Neurosurgery* 18, 373–375 (1986).
- (31) Sottile, F. D. et al. Nosocomial pulmonary infection: possible etiologic significance of bacterial adhesion to endotracheal tubes. *Crit. Care Med.* 14, 265–270 (1986).
- (32) Sanford N.E., Wilkinson J.E., Nguyen H., Diaz G., Wolcott R. Efficacy of hyperbaric oxygen therapy in bacterial biofilm eradication. *J. Wound Care.* 2018;27:S20–S28. doi:10.12968/jowc.2018.27.Sup1.S20.[PubMed] [CrossRef] [Google Scholar]



**WHEN THE BREATH IS
UNSTEADY, ALL IS
UNSTEADY; WHEN THE
BREATH IS STILL; ALL IS
STILL. CONTROL THE
BREATH CAREFULLY.
INHALATION GIVES
STRENGTH AND A
CONTROLLED BODY;
RETENTION GIVES
STEADINESS OF MIND
AND LONGEVITY;
EXHALATION PURIFIES
BODY AND SPIRIT.**

GORAKSASATAKAM

WHY HORMONAL BIRTH CONTROL IS NOT THE ANSWER

BY

DANIELLA SWANEPOEL



We're in a strange time for women's health. A time where it's ok and perfectly 'normal' to routinely give a drug to switch off the hormones of millions of women and girls.

The sad truth is that your doctor may not care very much about your symptoms or concerns. He/she is not thinking about which underlying issue is the cause of your period problems because the solution is always the pill.

"The Pill" is an oral contraceptive, which is one of the types of hormonal birth control that supports ovulation. The pill is a handy 'fits-all' solution, globally over prescribed by all western doctors. Missing periods? Take the pill. Polycystic ovary syndrome or endometriosis?

**Take the pill.
Now want to
become pregnant?
So take the fertility
drug.**

The pill can be a predictable 'band aid' solution. It surpasses skin oil, so excellent for clearing up pimples. It overrides hormones, so great for reducing annoying symptoms - but only as long as you keep taking it. Stopping the pill can be very challenging as conditions such as acne and depression and anxiety can become worse when coming off the pill.

The pill forces you to have a bleed, which might seem reassuring, but there is a problem. A pill bleed is not a real period. A real period is a finale in a series of hormonal events, which include ovulation and the production of progesterone. A real period, which usually comes around approximately every 28 days, will indicate the healthy functioning of your ovaries. Hormonal birth control-forced bleed does not proceed from ovulation.

It can be more described as a withdrawal bleed from the drugs that stimulate the uterine lining, but at the same time shuts down your ovaries.

Therefore hormonal birth control works by shutting down your ovaries and switching off your hormones. A pill bleed is a direct response to the drugs and artificial hormones that have been taken. Steroid drugs are given to you as a kind of 'hormone replacement'. These steroid drugs are not the same as your own estrogen and progesterone, which can pose a big problem for health.

There is no medical reason to bleed monthly on hormonal birth control, so why do it? In the 1950s when the pill was invented. It was invented as contraception, but contraception was not yet legal, so instead, the pill was prescribed to ostensibly 'treat female disorders' and to 'regulate late menstruation'. (1)

'Regulate' was a preferred term used to get your period and 'not be pregnant'. Therefore the whole 'normalize periods' prescription started as a cover-up story, and now decades later that story still lives strong. Many doctors continue to prescribe birth control to 'normalize' periods and 'regulate' hormones as though the pill's steroids are somehow equal to or better than our own hormones.

The fact is, nothing could be further from the truth. Pill steroids are not better than your hormones. They're not even actual hormones.

SIDE EFFECTS & RISKS OF USING HORMONAL BIRTH CONTROL FOR DEVELOPMENT OF DISEASES LIKE CANCER

It has been shown that hormonal birth control slightly increases your risk of breast cancer. This is true of all modern methods including low-dose pills, implants, and hormonal IUD. Scientists had long known that the high-dose estrogen pills increased the risk of breast cancer, thinking and hoping that the modern lower dose pills and progestin-only devices were safer. A large 2017 study discovered that modern methods carry the same cancer risks as a high dose of estrogen pills. (2)

BLOOD CLOTS

All Hormonal birth control carries a risk of a blood clot, which was known almost from the beginning. Barbara Seaman wrote a book about it in 1969 *The Doctor's Case Against the Pill*. (3)

Decades later and not much has changed, and disgustingly enough the blood clot risk is downplayed again and again. We're told that each new generation of the pill is better and safer but not unlike the 'low-tar' advertising used in the cigarette industry, the term 'low dose' and 'new generation' is mostly just that - advertising.

'New generation' merely refers to the decade in which a new steroid progestin was invented. Some modern progestins such as drospirenone have a higher risk of fatal blood clots of any progestin so far. (4)

DEPRESSION

It's a known fact that hormonal birth control affects mood, however, this was always claimed as 'unproven' by the medical industry, until October 2016 when the prestigious medical journal *JAMA Psychiatry* released a groundbreaking study called "Association of Hormonal Contraception with Depression". (5)

In the study, researchers from the University of Copenhagen tracked one million women over thirteen years and found that girls and women who use hormonal birth control are significantly more likely to be diagnosed with depression. The risk was greater for teens using progestin-only methods such as implants or Mirena IUD. Researcher Professor Ojvind Lidegaard pointed out that his results may be an underestimation because he looked only at birth control users who went on to be diagnosed and take antidepressants.

Many women who
experience mood
changes on birth
control simply don't
say anything to their
doctor.



A follow-up study from the same group of researchers found that women taking birth control had triple the risk of suicide. (6)

Birth control is also found to affect your mood. The drugs used in birth control make your nervous system more sensitive to stress. (7) (8) The levonorgestrel-releasing intrauterine device potentiates stress reactivity. (7)

The influence of combined oral contraceptives containing drospirenone on hypothalamic-pituitary-adrenocortical axis activity and glucocorticoid receptor expression and function in women with polycystic ovary syndrome. (8)

Another is by changing the structure of your brain. In 2015, Nicole Peterson found that women who take hormonal birth control have altered brains compared to women who cycle naturally.

"The change in the lateral orbitofrontal cortex may be related to the emotional changes that some women experience when using birth control pills."(9)

Though women tend to blame themselves for feeling depressed, they tend to forget to consider the effect of the daily hormones they are taking. Birth control is directly linked to causing or contributing depression in women. The onset of depression can happen within a day of taking the pill or within a year of taking it. Some women reported the effects being so crippling, they're often unable to get out of bed for hours on end. (10)

LOSS OF LIBIDO / SEX DRIVE

Hormonal birth control can be bad for your sex life because it switches off the testosterone you need for libido. It can also cause vaginal dryness and put you at risk of vaginismus, a condition which makes sex painful. According to one survey, women who take hormonal birth control reported less frequent sex, less frequent feelings of arousal, less pleasure, fewer orgasms and less vaginal lubrication. (11)

It can take months or even years for libido to return to normal once the pill is stopped. (12)

The change in lateral orbitofrontal cortex may be related to the emotional changes that some women experience when using birth control pills.

**NICOLE PETERSON,
NEUROSCIENTIST**

HAIR LOSS

Some progestins such as levonorgestrel have a high androgen index, which means they are testosterone-like. This is what causes hair loss. The American Hair Loss Association (AHLA) warns about the risk of hair loss from hormonal birth control. In 2010 it stated: "It's imperative for all the women especially for those who have a history of hair loss in their family to be made aware of the potentially devastating effects of birth control pills on normal hair growth." (13)

Progestins with high androgen index, found in birth control that causes hair-loss, includes ingredients such as medroxyprogesterone acetate, levonorgestrel, norgestrel, and etonogestrel. The hair loss occurs due to the shrinking of the hair follicles, which is a slow process. One could be on the birth control pill for many months or even years, before starting to notice hair loss.

Progestins with a high androgen index can also cause acne.

Progestins with low androgen index include drospirenone, norgestimate, and cyproterone, which can cause hair loss when you stop taking them because they cause a rebound surge in androgens and androgen sensitivity. Androgenic or androgenetic alopecia (female pattern hair loss) is a symptom common with women who have been on this type of hormonal birth control. (14)

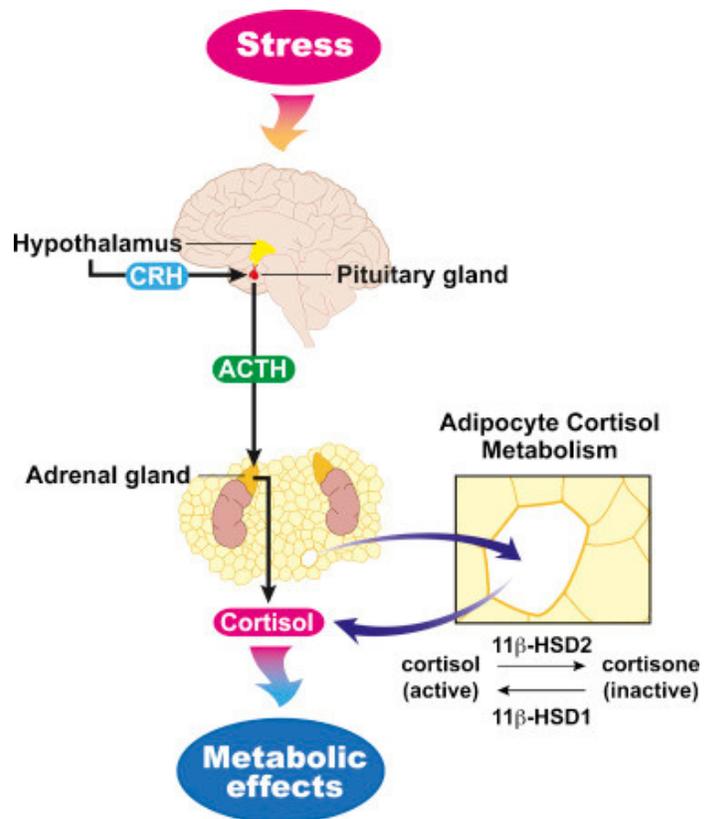
WEIGHT GAIN

Hormone birth control interferes with the insulin hormone which causes weight gain. The pill also causes sugar cravings and prevents muscle gain. The pill's synthetic estrogen causes fat to be deposited on the hips and upper thighs and therefore worsens cellulite. (15)

Other symptoms caused by hormonal birth control include high blood pressure, nutrient deficiency, and reduced thyroid function. Hormonal birth control alters both your intestinal and vaginal bacteria that lead to digestive problems, yeast infections, and abnormal PAP smears.

Studies have shown that hormonal birth control may prevent you from forming healthy bones Scholes D, Ichikawa L, LaCroix AZ, Spangler L, Beasley JM, Reed S, et al. Oral contraceptive use and bone density in adolescent and young adult women. (16)

If all these side effects were not enough, there are also the problems women face when they stop hormonal birth control such as Post-Pill Acne; Post-Pill PMS; Post-Pill Amenorrhea, and PCOS.

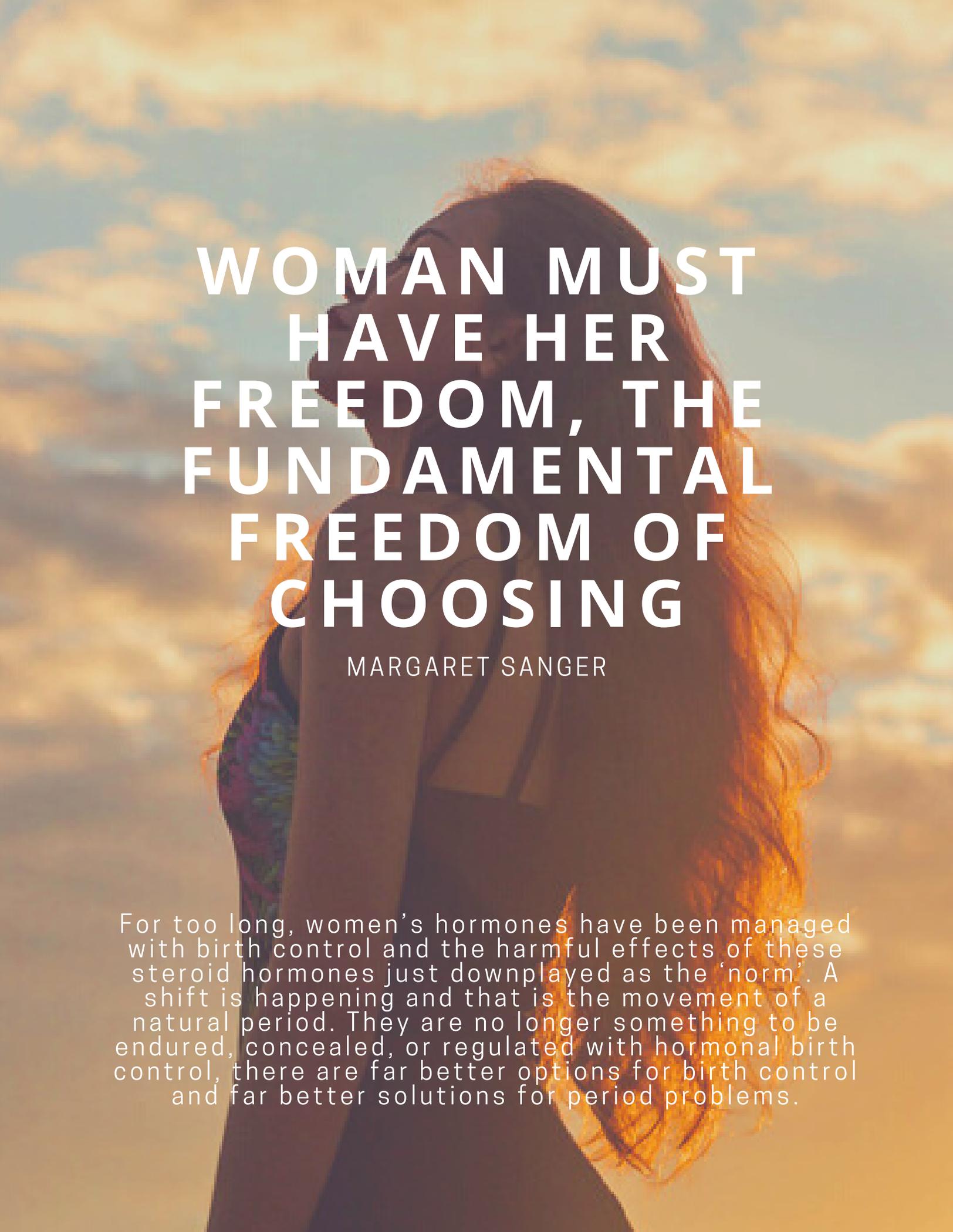


In modern society, stress is a big theme and has been known to increase ACTH release which in turn increases cortisol levels in our body through the Hypothalamic-Pituitary- Adrenal axis.

Yoga is often related to decreased stress in practitioners which showed also in a decrease in cortisol as well ACTH (Adrenocorticotropic hormone). Further Conclusion

For too long , women’s hormones have been managed with birth control and the harmful effects of these steroid hormones just downplayed as the ‘norm’. A shift is happening and that is the movement of a natural period. They are no longer something to be endured, concealed or regulated with hormonal birth control, there are far better options for birth control and far better solutions for period problems. More women are saying No to hormonal birth control and Yes to their own natural monthly cycles.

Extracts in this article adapted and taken from Briden ND, Lara. Period Repair Manual, Second Edition: Natural Treatment for Better Hormones and Better Periods

A woman with long, wavy hair is shown from the chest up, looking out towards the horizon. The background is a soft, golden sunset or sunrise over the ocean, with the sky filled with light, wispy clouds. The woman's hair is illuminated by the warm light, and she appears to be wearing a dark, possibly black, top. The overall mood is serene and contemplative.

WOMAN MUST HAVE HER FREEDOM, THE FUNDAMENTAL FREEDOM OF CHOOSING

MARGARET SANGER

For too long, women's hormones have been managed with birth control and the harmful effects of these steroid hormones just downplayed as the 'norm'. A shift is happening and that is the movement of a natural period. They are no longer something to be endured, concealed, or regulated with hormonal birth control, there are far better options for birth control and far better solutions for period problems.

REFERENCES

1. Half a century of the oral contraceptive pill Historical review and view to the future Pamela Verma Liao, MD and Janet Dollin, MD CM CCFP FCFP <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3520685/>
2. Mørch LS, Skovlund CW, Hannaford PC, Iversen L, Fielding S, Lidegaard Ø. Contemporary Hormonal Contraception and the Risk of Breast Cancer. *N Engl J Med.* 2017 Dec 7;377(23):2228-2239. PubMed PMID: 29211679 <https://www.ncbi.nlm.nih.gov/pubmed/29211679>
3. Seaman, Barbara. 1995. *The Doctor's Case Against the Pill.* Hunter House (CA); 25 Anv. Edition (July 1995). ISBN: 978-0-89793-181-6
4. *BMJ.* 2011 Oct 25;343:d6423. doi: 10.1136/bmj.d6423. Risk of venous thromboembolism from use of oral contraceptives containing different progestogens and oestrogen doses: Danish cohort study, 2001-9. Lidegaard Ø1, Nielsen LH, Skovlund CW, Skjeldestad FE, Løkkegaard E. <https://www.ncbi.nlm.nih.gov/pubmed/22027398>
5. Association of Hormonal Contraception With Depression. Skovlund CW1, Mørch LS1, Kessing LV2, Lidegaard Ø1. <https://www.ncbi.nlm.nih.gov/pubmed/27680324>
6. *Am J Psychiatry.* 2018 Apr 1;175(4):336-342. doi: 10.1176/appi.ajp.2017.17060616 Epub 2017 Nov 17. Association of Hormonal Contraception With Suicide Attempts and Suicides. Skovlund CW1, Mørch LS1, Kessing LV1, Lange T1, Lidegaard Ø1. <https://www.ncbi.nlm.nih.gov/pubmed/29145752>
7. Aleknavičute J, Tulen JHM, De Rijke YB, Bouwkamp CG, van der Kroeg M, Timmermans M, et al. The levonorgestrel-releasing intrauterine device potentiates stress reactivity. *Psychoneuroendocrinology.* 2017 Jun;80:39-45. PubMed PMID: 28315609
8. Macut D, Božić Antić I, Nestorov J, Topalović V, Bjekić Macut J, Panidis D, et al. The influence of combined oral contraceptives containing drospirenone on hypothalamic-pituitary-adrenocortical axis activity and glucocorticoid receptor expression and function in women with polycystic ovary syndrome. *Hormones (Athens).* 2015 Jan-Mar;14(1):109-17. PubMed PMID: 25402380
9. Petersen N, Touroutoglou A, Andreano JM, Cahill L. Oral contraceptive pill use is associated with localized decreases in cortical thickness. *Hum Brain Mapp.* 2015 Jul;36(7):2644-54. PubMed PMID: 25832993
10. Just How Safe Is The Pill, Yaz? Anxiety, depression, blood clots....marie claire investigates the concerning side effects of the contraceptive pill Yasmin - by Marie Claire <https://www.marieclaire.com.au/yasmin-side-effects>
11. <https://kinseyinstitute.org>
12. Panzer C, Wise S, Fantini G, Kang D, Munarriz R, Guay A, et al. Impact of oral contraceptives on sex hormone-binding globulin and androgen levels: a retrospective study in women with sexual dysfunction. *J Sex Med.* 2006 Jan;3(1):104-13. PubMed PMID: 16409223
13. American Hair Loss Association
http://www.americanhairloss.org/women_hair_loss/oral_contraceptives.asp
14. (*Dtsch Med Wochenschr.* 1974 Oct 25;99(43):2151-4, 2157.[The effects of oral contraceptives on male-pattern alopecia, seborrhoea, acne vulgaris and hirsutism. Anamnestic study on 325 women]. Article in German Hoffmann E, Meiers HG, Hubbes A. PMID: 4139008 DOI: 10.1055/s-0028-1108103
15. Oral Contraceptives Impair Muscle Gains In Young Women Date: April 20, 2009 Source: American Physiological Society <http://www.sciencedaily.com/releases/2009/04/090417084014.htm>
16. Oral contraceptive use and bone density in adolescent and young adult women. Scholes D1, Ichikawa L, LaCroix AZ, Spangler L, Beasley JM, Reed S, Ott SM. *Contraception.* 2010 Jan;81(1):35-40. PubMed PMID: 20004271 <https://www.ncbi.nlm.nih.gov/pubmed/20004271>

IS HOT YOGA ACTUALLY GOOD FOR YOU?

BY
ANDREA BUNZL

An overview of the current state of affairs and benefits and risks of Hot Yoga. Before looking into different affects on the human body, we discuss the history of modern yoga and the development of "Hot Yoga".

What is "Modern Yoga"?

Elizabeth De Michaelis clarifies the term "modern yoga" as something an average English speaker would understand, specifically when the word yoga is defined: the performance of yoga poses (asana) within a classroom format, or the same type of practice performed at home with the help of books, audio-visual tools, or on the basis of one's memory and knowledge. She also mentioned that the Indic semantic range of the word yoga is far wider, varied, and more layered than the English counterpart. The average English speaker would name this by meditative and contemplative endeavors: prayer; ritual and devotional practices of various kind selfless ethical behaviors; secret esoteric techniques and so on. The writer underlines here not only the different linguistic usage but also the radically different conceptual and performative aspects of Yoga.

A Brief History of "Modern Yoga"

According to the paper "A Preliminary Survey of Modern Yoga Studies" by Elizabeth De Michaelis, "Modern yoga has emerged as a transnational global phenomenon during the course of the twentieth century and from about 1975 onward. It has progressively become acculturated in many different developed or developing societies and milieus worldwide." As reported in the book "Science of Yoga – A Comprehensive Approach" by Prof. Dr.P.K.Aiyasamy, "The history of yoga dates back 5000 years or more; and relies on some historical evidence of certain archaeological excavations, Vedic literature (4500-2500 B.C.E.) and related ancient materials. "He also mentions that the journey of

yoga over time is pretty inspiring. "Had it not been to its strength, vitality and inherent potentials for its suspense under all vicissitudes, Yoga could have disappeared long ago. Today yoga stands as a dynamic entity with its glory and splendors and vouchsafes of its contribution to the civilization's over-all health, happiness and mental peace." According to Aiyasamy, he attributes an Indian man called Thriumalai Krishnamacharya, for being responsible for the resurgence of Yoga in India and he is known as the father of modern yoga. The Maharaja of Mysore helped him to start a yoga school in his palace in 1935.

Some aspects of Krishnamacharya's teaching influenced most yoga teachers of this era. Teachers like K. Pattabhi Jois, B.K.S Iyengar, Indira Devi and Krishnamacharya's son T.K.V. Desikachar. Thriumalai Krishnamacharya spent seven years with his guru Ramamohan Bramachari learning the yoga philosophy; memorizing the yoga sutras of Patañjali (He is the first codifier of yoga from different Upanishads and Vedic literature.); learning asanas and pranayama and studying the therapeutic aspects of yoga. Prof. Dr.P.K.Aiyasamy describes Krishnamacharya as a pioneer in refining postures, sequencing them optimally, and ascribing therapeutic value to specific asanas. Furthermore, yoga spread throughout Europe, Asia, and America. K. Pattabhi Jois, B.K.S Iyengar, Indira Devi and Krishnamacharya's son T.K.V. Desikachar learned from him and played a huge role in popularizing yoga in the west from the 1940s.

A yoga style called Ashtanga Vinyasa Yoga which is mainly the archetype of many dynamic yoga styles nowadays was also developed by Krishnamacharya. A large and diverse audience including British soldiers and muslim maharajas were interested in his public demonstrations. Together with Pattabhi Jois, Krishnamacharya translated and reconstructed the Ashtanga series. Stated by Prof. Dr.P.K.Aiyasamy, "Ashtanga taught by Pattabhi Jois is a form of Hatha Yoga which focuses on asana (yoga posture) and pranayama (is the practice of breath control in yoga) called asthanga vinyasa yoga".

THE ORIGINS OF HOT YOGA

In 1973, Bikram Choudhury set up his first yoga college in the USA. He imparted a very different kind of yoga with 26 copyrighted postures. Bikram Yoga is a hatha-yoga method and was propagated by the Indian yoga master Bikram Choudhury, student of Bishnu Charan Ghosh (brother of Paramahansa Yogananda), and by Bikram. The publication by the Yogi Mukul Dutta of the written teaching of Bishnu Charan Ghosh (Yoga-Cure) proves that the positions and the sequence of these positions were not developed by Bikram, but are the creation and thus a copy of the teaching of his master Bishnu Charan Ghosh.

Bikram Yoga is a series of 26 yoga exercises that are practiced in a hot room (approx. 35-40 degrees Celsius). Bikram Yoga is generally known as hot yoga and is now a relatively popular type of yoga with more than 600 schools worldwide. Bikram Choudhury tried to protect the yoga method presented as his own. An American court, however, dismissed his claims on 8 August May 2015.

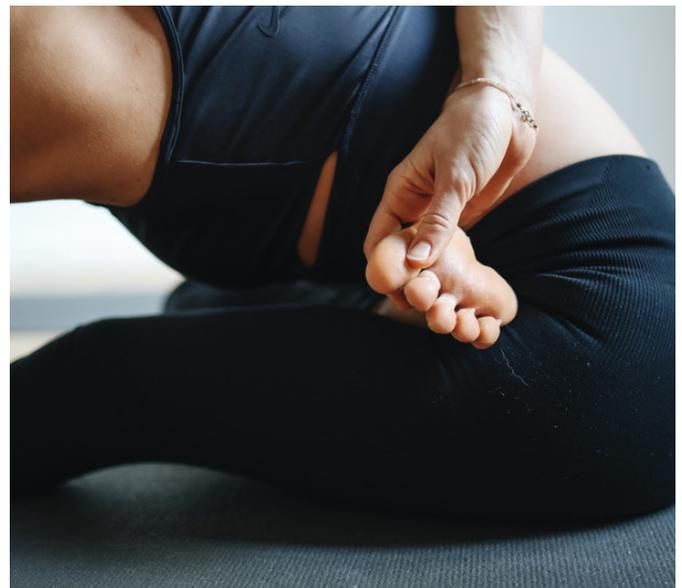
DIFFERENCE BETWEEN BIKRAM AND HOT YOGA

Also, other styles of hot yoga have been developed by some students of Bikram. For example Jimmy Barkan’s Method. On his webpage, he clarifies what this Method is “ The Barkan Method is a style of Hatha Yoga. Hatha Yoga is the physical form of yoga designed to bring balance and well-being into your life. It is the perfect lifetime fitness program and totally different from any other kind of exercise.”

In his next statement, he differentiates this method from other hot yoga forms. “The Barkan Method is built on many of the poses and philosophies of Bikram Choudhury and Bishnu Ghosh but integrates postures from other styles of yoga. Jimmy has been teaching yoga since 1981. He has found that even though consistency is important to measure results, daily variations are necessary to challenge, excite, and help students become unlimited in their practice.

There are many alignment differences between Barkan and Bikram as well: Barkan does not believe in “Locking the Knee,” and crunching into the lower back. “As we see there are also controversies to the Bikram Yoga philosophy. Barkan was not the only one who designed his own hot yoga style; many other yoga teachers simply took advantage of the heat and created their own hot yoga style with different philosophies and in various different settings.

For example, Baron Baptiste Power Yoga was founded in the 1940’s by Walt Baptiste and through his son Baron, The room is heated to a lower temperature than Bikram Yoga, and 53 poses or asanas are linked together in a connective way and building momentum. It consists of five classical pillars: Drishti (gaze), Ujjayi (breath), Bandhas (foundation), Tapas (heat), and Vinyasa (flow). The physical aspects of his teaching are inspired by Hatha.



Yoga teachings of Krishnamacharya and his students Iyengar and Desikachar, whom Baptiste studied with personally from a young age, continued the evolution of yoga. Another one in this range is Moksha yoga known as Modo Yoga, based on Bikram Yoga and was founded in 2004 by human rights and environmental activists Jessica Robertson and Ted Grand. This Moksha series also includes more upper body strength asanas than Bikram Yoga does. Moreover, Moksha Yoga has an explicit environmental commitment which means that every Moksha studio has to be Eco-certified and leave the minimum energy footprint possible. A lot of variety shows the success of Tribalance Hot Yoga created by Corey Kelly and Shawnda Flavo in 2007. They emphasize quiet mindfulness and meditation as part of a well-balanced practice. They offer a range of different styles like a traditional Tribalance Hot Yoga class or Yin Flow, Yin Yoga, Beginners Yoga, Release Yoga, and more.

YOGA AFFECTS THE 21st CENTURY HUMAN

According to the book "Asana Pranayama Mudra Bandha" by Swami Satyananda Saraswati, the central theme of yoga remains the highest goal of the spiritual path. Yogic practices give tangible benefits to everyone regardless of their spiritual aims. Physical and mental cleansing and strengthening is one of yoga's most important achievements. He also mentions the fact that yoga works on the holistic principles of harmony and unification. Modern science has now proved that yoga therapy is successful because of the balance created between the nervous and endocrine systems which directly influence all other systems and organs of the body. Maybe this fact is also a reason for the ongoing popularity of yoga in the 21st century. Swami Satyananda states that the relevance of yoga today "in the 21st century, (is) beyond the needs of individuals, (that) the underlying principles of yoga provide a real tool to combat social malaise." He also mentions a kind of global loss, rejection of past values without being able to establish new ones and that yoga provides a means for people to find their own way of connecting with their true selves.

Yoga has many elements to its practice, all of which can affect our body through different mechanisms."

-2017, Telles et al

ASANA'S AFFECT UPON HUMAN PHYSIOLOGY

The physical part of yoga refers to asanas. They are yogic poses and exercises which can be done standing, sitting, or while lying down. These postures are very powerful positions to increase the flexibility, strength, and endurance of an individual (Telles and Nilkamal, 2017). Various studies prove these effects which are discussed below.

ASANA FOR PAIN RELIEF?

Tekur et al. (2008) in a randomized controlled trial examined the effects of yogic asanas on 80 patients with chronic lower back pain. The trial showed that there was a significant increase in the spinal flexibility measures such as flexion, extension, and right and left lateral extension. This increase was seen to reduce chronic lower back pain. In addition, the effect of asanas for relieving symptoms of carpal tunnel syndrome was studied with a randomized controlled trial (n=42). The result of this trial showed that the yoga group showed a significant increase in grip strength and a significant decrease in pain released because of carpal tunnel syndrome (Garfinkel et al, 1998).

ASANA AFFECT ON NCDs

A study conducted by Singh et al. (2008) observed the effects of yogic asanas and pranayama on the serum insulin, blood sugar, and lipid profiles of patients suffering from type 2 diabetes. In the randomized trial, 60 patients were divided into 2 groups, a yoga performing group and a control group with individuals on type 2 diabetes medication.

The control group showed improvements in some biochemical parameters, whereas the group practicing yoga showed a significant improvement in all measured biochemical parameters; serum insulin levels, blood glucose levels, and their lipid profiles. Another study showed a positive impact of yogic asanas on the blood flow to the thyroid. A significant increase in the Peak Systolic Volume and a decrease in the Resistive Index showed increased blood flow to the thyroid after three months (Anu and Senthil Nathan et al. 2012).

From a TIFA standpoint, we see non-communicable diseases as lifestyle diseases. Here comes into play the choices we make, the way we think and look at things differently.





In modern society, stress is a big theme and has been known to increase ACTH (Adrenocorticotropin hormone) release which in turn increases cortisol levels in our body through the Hypothalamic-Pituitary- Adrenal axis.

Yoga is often related to decreased stress in practitioners which showed also a decrease in cortisol as well as ACTH. Furthermore, this can be attributed to the decreased stress and decreased activation of the HPA axis. (Arora & Bhattacharjee et al., 2008)

Another reason could also be the increased parasympathetic nervous system activity and a decreased sympathetic nervous system activity presumably activated after performing yogic activities (Barghava, Gogate, & Mascarenhas et al., 1988).

EFFECTS OF HEAT ON POSES

As already mentioned above, hot yoga is practiced in a heated room with temperatures between 35-40 degrees Celsius which exceeds skin temperature. It is also above the core body temperature in a person doing exercise. The body's primary protection against overheating is evaporation to transfer heat from its core by releasing sweat from the skin and respiratory passages.

Humidity leads to increased sweating due to the impaired evaporation which causes a greater loss of body fluid. The humidity in the yoga room depends on the heat source, room ventilation, and the number of students participating. Equally the sweat rate increases, body fluids increase, and the replacement for fluids become a high priority during exercise. If the fluids are not adequately replaced, the body's ability to dissipate heat is compromised.

Also coming into play are proper hydration at the start of the practice to replace the fluids effectively while exercising. There was one case of a 34-year-old woman who was admitted into hospital with breathlessness, muscle cramps, nausea, and general malaise from drinking 3,5 liters of water after her first Bikram class.

Her tests showed severe hyponatremia and respiratory alkalosis.

Hot yoga instructors hold a key role in encouraging hydration and student safety outcomes.

-Firebaugh, Eggleston, et al. 2017

(Hyponatremia is a form of electrolyte disorder which is the abnormal deviation of the plasma concentration of a physiologically significant electrolyte from the norm. In extreme cases, a serious or persistent electrolyte disorder can lead to heart problems, nervous system dysfunction, organ failure, and eventually death.).

Hot yoga instructors hold a key role in encouraging hydration and student safety outcomes. [Firebaugh, Eggleston, et al. 2017]

IMPACT OF DEHYDRATION

The plasma volume of the blood decreases and the body's ability to lose heat is compromised. Furthermore, an increased heart rate and a loss of endurance can lead to heat exhaustion. This can include a weak or rapid pulse, dizziness, headache, general weakness, and low blood pressure when standing upright. Moreover, there is a possibility that the blood sodium may become depleted and the symptoms of heat exhaustion can include vomiting and muscle cramping, combined with progressive weakness.

GOOD HYDRATION PRACTICE

From a TIFA standpoint, we believe that the body needs 3 liters of water to maintain a healthy hydration balance through the body. In the article "Hot" Yoga: Physiological Concerns 19 while Exercising in the Heat, the recommendations for hydration before, during, and after exercise are:

1. Daily intake of 8–10 glasses of water (8 oz. per glass) for normal activity, not including exercise.
2. At least 2 hours prior to exercise, drink 16 oz. of water or fluid without caffeine.
3. If possible, determine body weight while hydrated, prior to exercise.
4. During exercise, drink frequently and before you are actually thirsty. Your goal is to replenish fluids at the same rate you are sweating. The maximal rate of replacement is between 20–40 oz. per hour, based on the absorption of fluid by the stomach.

5. After exercise, evaluate the change in body weight. Consume fluids to return to body weight prior to exercise.

We need to take into account that these recommendations do not consider individual constitutions like the intake of caffeinated beverages such as coffee, many teas, and sodas which will increase fluid loss by increasing urinary output. Wine, beer, and other alcoholic beverages cause fluid loss as well. TIFA also considers an unbalanced diet which is high in processed foods and poor in fruits & vegetables as a factor for dehydration in the body.

EFFECTS OF HEAT AND PHYSICAL ACTIVITY

Besides the importance of hydration and the level of fitness in the human body, heat also has good effects. For example, a regular practice of Finnish saunas creates a lot of positive health effects that also go beyond the cardiovascular system. It is also associated not only with a reduction of cardiovascular health effects but also with all-cause mortality. A very interesting development in the science behind hot yoga science is the research into hyperthermic conditions.

The research in this field along with the work of Dr. Rhonda Patrick, a biochemical researcher is moving forward. Increased endurance and capacity to build muscle have been proven through the use of hot rooms. Furthermore, early evidence is suggesting that hyperthermic conditioning improves the production of human growth hormone and heat shock proteins. Both conditions lead to enhance muscle growth and healing. She also argues that it is this acclimatizing to heat that produces what is known as the "runner's high". This could be what hot yoga lovers recognize after a good hot yoga class.

CONCLUSION

The intention of this article is to raise awareness of the bigger picture perspective in the field of hot yoga. She is a certified yoga teacher and teaches different styles including hot yoga. Her experience in this field are mainly positive, nonetheless, there was a curiosity to find some scientific data about this practice. The findings she made clearly underline the importance of hydration before and after hot yoga as well as the good overall health of the participants.

Moreover, this highlights the importance of clear guidelines a hot yoga studio should give in terms of hydration and diet, as well as physical symptoms of premature dehydration.



**YOGA IS
THE
JOURNEY
OF
THE SELF,
THROUGH
THE SELF,
TO THE
SELF.**

The Bhagavad Gita



REFERENCES

De Michelis, Survey of Modern Yoga 2007

Swami Satyananda Saraswati, Asana Pranayama Mudra Bandha

Development of Hot Yoga

History of Yoga Krishnamacharya

<https://de.pons.com/%C3%BCbersetzung/englisch-deutsch/Documentation>

<https://cases.justia.com/federal/appellate-courts/ca9/13-55763/13-55763-2015-10-08.pdf?ts=1444323834>

<https://www.barkanmethod.com>

<https://www.baptisteyoga.com/what-is-baptiste-power-yoga/>

<https://savannahpower yoga.com/about-baptiste-yoga>

<https://modoyoga.com/pillars/>

<https://tribalance.com/our-studio/>

<https://www.iayt.org/page/HotYoga/Hot-Yoga-Physiological-Concerns-while-Exercising-in-the-15Heat.html>

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3433526/> 16 <https://www.ncbi.nlm.nih.gov/pubmed/28546683>

<https://www.instituteforaliveness.com/account/lesson-5> 19 <https://www.instituteforaliveness.com/account/lesson-5>

<https://yogainternational.com/article/view/hot-and-bothered-the-hype-history-and-science-of-22hot-yoga# citations>

CIRCADIAN RHYTHMS AND THE COSMOLOGICAL CLOCK

DOES THE BODY CARE ABOUT TIME?

BY CAROLINE NAUGHTON

Before modern times, humans hunted and ate during the day and slept and rested at night. Today's hectic, always-on lifestyle, has resulted in humans being out of rhythm with the circadian instincts we evolved during the cave days. Our bodies simply have not adapted to this new reality of relative food abundance, leading to chronic under-rest and desynchronization of the somatic symphony.

This paper inquires into the importance of time in fasting physiology and examines the digestive system from a chronobiological perspective. In the modern movement for digestive healing, intermittent fasting is like a metronome producing steady circadian rhythms for the entire body to hear. Now it is necessary to investigate the physiological origins of this life-giving count.

Just as the planets revolve around the ecliptic, our hormones revolve around the primordial heartbeat. This central pacemaker is composed of translational feedback loops, which translate light frequencies from one musical organ to the next vis-à-vis hormonal secretions in the bloodstream. Time is of the essence when measuring physiological processes. These harmonics are often referred to as biorhythms. Biorhythms that are synchronized with the 24-hour light/dark cycle are called circadian rhythms.

When measuring biorhythms, and circadian rhythms, in particular, scientists often look to melatonin. Melatonin is an evolutionarily conserved molecule shown to be the essential timekeeper in human physiology. High levels of melatonin are normally found at night. Low levels are seen during daylight hours. As a consequence, melatonin has been called the darkness hormone. (1)



Sensitive to light signals, melatonin is produced predominantly by the pineal gland with a marked circadian rhythm that is governed by the central circadian pacemaker in the suprachiasmatic nuclei (SCN) of the hypothalamus. (2) Although circadian rhythms are cell autonomous, there is a hierarchical architecture to the organization of oscillators. A central oscillator in the hypothalamic SCN generates daily rhythms in activity-rest. Photoc information is perceived by the retina and transmitted to the SCN via the retinohypothalamic tract. Synchronization of SCN cells leads to coordinated circadian outputs that regulate peripheral rhythms.

Clocks, similar to those found in SCN cells, are found in many peripheral tissues, such as the liver, intestine, heart, adipose tissue, retina, and in various brain regions. (3) This instills the notion that all organ systems have internal timing mechanisms which allow them to correspond and relate physiologically.

The central oscillator is entrained to ambient light in order to be synchronized with the circadian rhythm. This ensures adaptation of the organism to changing day length under natural conditions. The SCN is akin to a master clock in the brain, which coordinates all of the peripheral biological clocks throughout the nervous and endocrine systems. The job of the SCN is to keep the various clocks in sync. The SCN is located in a part of the brain called the hypothalamus and receives direct input from the eyes. Three main steps are important for biological clock function: input (retina) ==> SCN circadian pacemaker (neurotransmitters/protein peptides) ==> output (pineal melatonin synthesis, thermoregulation, etc.). (4) Here I will investigate the role of melatonin synthesis in circadian rhythmicity.

The most definitive physiological role of melatonin is to convey information about day length (photoperiod) to body physiology for the organization of functions that vary with season. These functions include reproduction, sleep, and appetite. (5) We have an internal clock that regulates appetite. Our bodies actually anticipate transitions between light signals (i.e., day and night) rather than merely react to them. The word 'circadian' has etymological roots in diurnal, relating to the daily motion of the sun. (6) Day/night is the most fundamental, cosmologically influenced circadian rhythm in nature. When fasting and feeding are studied within the bounds of daily motion, science can measure circadian synchronization.

Life forms on our planet have evolved under the strong influence of a daily light/dark cycle. With sunlight as the primary source of energy for photosynthesis, the daily production of photosynthetic biomass has a predictable diurnal rhythm.

The daily cyclical production of photosynthesized chemical energy is at the base of the food chain. Daily changes in light and darkness result in diurnal rhythms in other environmental parameters such as temperature and humidity. Such a predictable and robust daily rhythm in food availability and environmental factors has led to the evolution of a 24-hour internal timing mechanism or circadian rhythm to enable organisms to anticipate daily changes and to optimize fitness.

Fundamental to this 24-hour rhythm is the ability to acquire food when it is available and to store a portion of these resources for utilization during the rest of the day (i.e., the fasting period) without compromising fitness and vitality. The fasting period also serves as a time for standby and repair so that the organism is fit and competent to harvest energy when light (for photosynthetic organisms) or food becomes available. (7)

Over time, our bodies developed networks of internal clocks, including ones in the brain and digestive system. If we consume food before going to sleep, our internal clocks get confused. The clock in our brain sees that the sun has set and is primed for sleep, while the clocks in our gut kick into high gear. The intestines are now actively digesting instead of relaxing—at the very moment when the central pacemaker is preparing for bed. This phenomenon is called circadian desynchronization, resulting in a cacophony of musical organs. The body simply has not evolved to sleep and digest in parallel; it prefers to focus on one task at a time. If we eat when it's light out and fast when it's dark, our brain and digestive system are naturally aligned.

Our digestive system works most efficiently with regular, recurring motions. Intermittent fasting is a modern tool being used to adjust the frequency of our musical organs and reestablish typical intervals between their respective tones. Intermittent fasting, or time-restricted feeding, simply refers to the period of time that occurs between eating meals. This period of non-eating could be minutes, hours, days, or even months, although the term typically implies a longer period of fasting than 1-3 hours and shorter than 3 or more days. (8)

Intermittent fasting reduces tension in the body by lowering the frequency between food signals. We can study the effect of intermittent fasting on circadian rhythms by measuring body temperature, heart rate, and other melatonin phase markers.

We can also look at the impact on other hormonal secretions in the blood. For example, when melatonin secretion is inhibited by disrupted circadian rhythm via overeating, insulin levels spike, thereby putting individuals at risk for greater insulin resistance.

DAY/NIGHT IS THE MOST FUNDAMENTAL, COSMOLOGICALLY INFLUENCED CIRCADIAN RHYTHM IN NATURE.

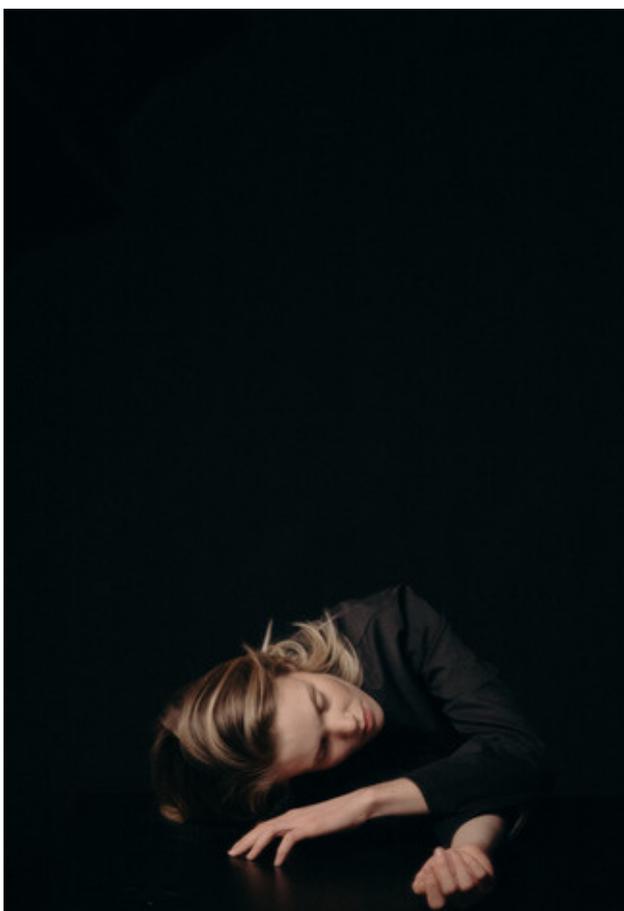


On the contrary, if melatonin levels are amplified due to increased darkness (rest) signals, insulin will be downregulated and higher blood sugar may result, putting the individual at risk for diabetes. (9). Furthermore, disruption of the coordination between the endogenous clock and the environment leads to symptoms of fatigue, disorientation, and insomnia as seen in jet-lagged travelers or altered hormone profiles and high morbidity as seen in shift workers. (10) Moreover, disruption of circadian rhythms can seriously impact overall health and increase cancer proneness. (11). Circadian dysrhythmia, as measured by hormonal and other metabolic proxies, occurs when the pineal gland of the hypothalamus is underperforming, as in the case of inhibited melatonin.

The circadian clock in mammals regulates metabolism by mediating the expression and/or activity of certain metabolic enzymes, hormones, and transport systems. (12) A large number of nuclear receptors involved in lipid and glucose metabolism has been found to exhibit circadian expression. The rhythmic expression and activity of the metabolic pathways is mainly attributed to the robust and coordinated expression of clock genes in the liver and adipose tissue. (13) The phases and amplitudes of rhythms of hormones associated with metabolic function, such as insulin, corticosterone, and prolactin, are disrupted in obese aged rodents. (14) Interestingly, administration of these hormones at specific times of day mimicking the rhythms of the younger phenotype leads to metabolic characteristics of younger animals.

The circadian clock controls a wide array of physiological and behavioral systems, including energy metabolism and gastrointestinal tract motility. There is at least 400 times more melatonin in the gastrointestinal tract than in the pineal gland, and so it is critical to examine the circadian rhythms of the digestive system. When exogenous melatonin is administered to rats, gastric emptying from the stomach is delayed. (15) This suggests the importance of maintaining a specified fasting window before sleep. Late night meals can affect the time it takes for us to fall asleep, as well as how much REM or deep sleep we get. (16) If we have a large meal too close to bed, our digestive system votes to prioritize processing food over sleep. And if the brain votes to sleep, then our digestion is awfully compromised. Such abundant levels of melatonin in the gut reveal the biological need for our digestion to take rest during sleep.

Many first-time fasters report disrupted sleep—the dreaded experience of lying wide awake in bed, bored and hungry.



Why is this? Even though it's dark outside and our body's other clocks have called for bedtime, the clocks in our digestive tract are reporting back: "We haven't eaten anything in a while! Are you sure we shouldn't stay up and look for food?" As a result, our body might jump into action and produce cortisol to keep us alert in case food becomes available. (17) During this time of fasting, the hypothalamus is too busy communicating with the adrenal glands (producing stress and hunger hormones) to focus on melatonin production. After an adjustment period, our body recaptures its rhythm and fasting can actually benefit sleep. (18)

All domains of life feature diverse molecular clock machineries that synchronize physiological processes to diurnal environmental fluctuations. Even the intestinal microbiota exhibits diurnal oscillations that are influenced by feeding rhythms. (19) In this light, intermittent fasting has the potential to institute universal time for all of the body's musical organs (and their bacteria). If the peripheral biological clocks were ticking at the same rate as the central pacemaker, consistent units of time would be recognized and accurate predictions made possible.

Each cell has its own autonomous circadian rhythm, and contains receptors attuned to a specific spectrum. This allows cells to specialize in receiving unique hormonal frequencies, synthesizing the proper proteins and encoding new genetic information at their respective sites. For melatonin to bind onto and cooperate with the cells of the circadian pacemaker, it must be within range and distribute appropriate signals to other cells within its network. Networks undergo clock entrainment so that the central pacemaker does not have to relearn its cues and the brain may stay focused on the task at hand.

Digestion prefers to have predictive power, as it establishes a foundation of safety for the limbic system and prevents an overwhelm of cortisol from the bloodstream. Attuning to the highest circadian oscillator can be compared to a symphony, whereby each ensemble member shows reverence and respect for the highest conductor. This is natural law, as some clocks simply exert more control than others. The central pacemaker must exist in a hierarchically synchronized network, where it gets to decide the metronome and regulate pulse to assist the body in playing harmonious rhythms. In this case, the periphery has no choice but to be on time, as it receives the appropriate time signature.

Rhythm is created through repetition, and circadian clocks depend on consistent behavior. Therefore, intermittent fasting windows can produce a reliable, predictable circadian government.

The body can have faith that the Sun will rise again, albeit perhaps a bit earlier than yesterday. Rhythms can be irregular, so long as they're still recognizable by the body.

Rhythm is the way that music is systematically divided into beats that repeat a specific number of times at a collectively understood speed or tempo. 'Collective' is the keyword here, as each musical organ attunes to the measure of pulse. Similarly, each human organism attunes to the larger solar system, as our biological and cosmological clocks converge. People who live in areas with different solar periodicities (seasons) will exhibit different temporal patterns of circadian rhythm

Ultimately, this inquiry presents a case for medical astrology in future chronobiological research. Astrology has been deemed pseudoscience by the scientific establishment; however, there may be a very real, quantifiable effect of planetary cycles on human physiology.

After all, we call the various parts of the human body 'organs' for a reason. The human organism is musical, and it's playing to a measurable rhythm if we are willing to count and track its patterns. Likewise, the planets are rhythmic beings which reflect our terrestrial participation in the greater celestial symphony. Sure, we each develop our own independent circadian rhythms, but we mustn't deny that we're very much attuned to a collective clock (the macrocosm). And if these clocks are aligned to a single unit of time, we get something called 'free' will and calendar calisthenics.

In the medical astrological tradition, Mercury cycles are referenced for electing ideal times to navigate communication channels. Mercury is the cosmic messenger that relays genetic information from host to microbiome, and due to its role as scribe, it would make sense to delegate this planet to protein transcription—a process that greatly enhances the proportion of genes under clock control. Our DNA is encoded with sheet music that tells each organ how to play the genetic sequence. Is it possible that through post-transcriptional regulation, Mercury makes a memory of each gene, thereby writing in the circadian rhythm? How else would the human organism synchronize the clock of host, microbiome, and planet earth within the solar system at large? If Mercury is the closest planet to the Sun (the central pacemaker of our solar system which defines the diurnal motion), then does it work together with melatonin to translate light signals directly from source?

Melatonin is diminished with the appearance of sunlight, and its planetary correlate Mercury also doesn't function well when combust the Sun (hence the notorious 'retrogrades'). Nighttime offers Mercury time to assimilate and translate the light of day to the rest of the human organism. The Sun is the central pacemaker of the circadian rhythm, which dictates the unit of time (day) in which all other planetary orbits are measured.

There is a respected hierarchical architecture to the organization of circadian oscillators throughout the world that is our body. Just as Mercury represents the transcription of rhythm, the Sun represents the original source of the music (located in the hypothalamus of the brain). As the Sun traverses the zodiacal order, the rest of the planetary bodies are affected by the seasons. Each day, Mercury carries different frequencies of melatonin relative to the daily amount produced during successive seasons. Might this explain the prevalence of seasonal affective disorder or other emotional extremities rooted in time of year?

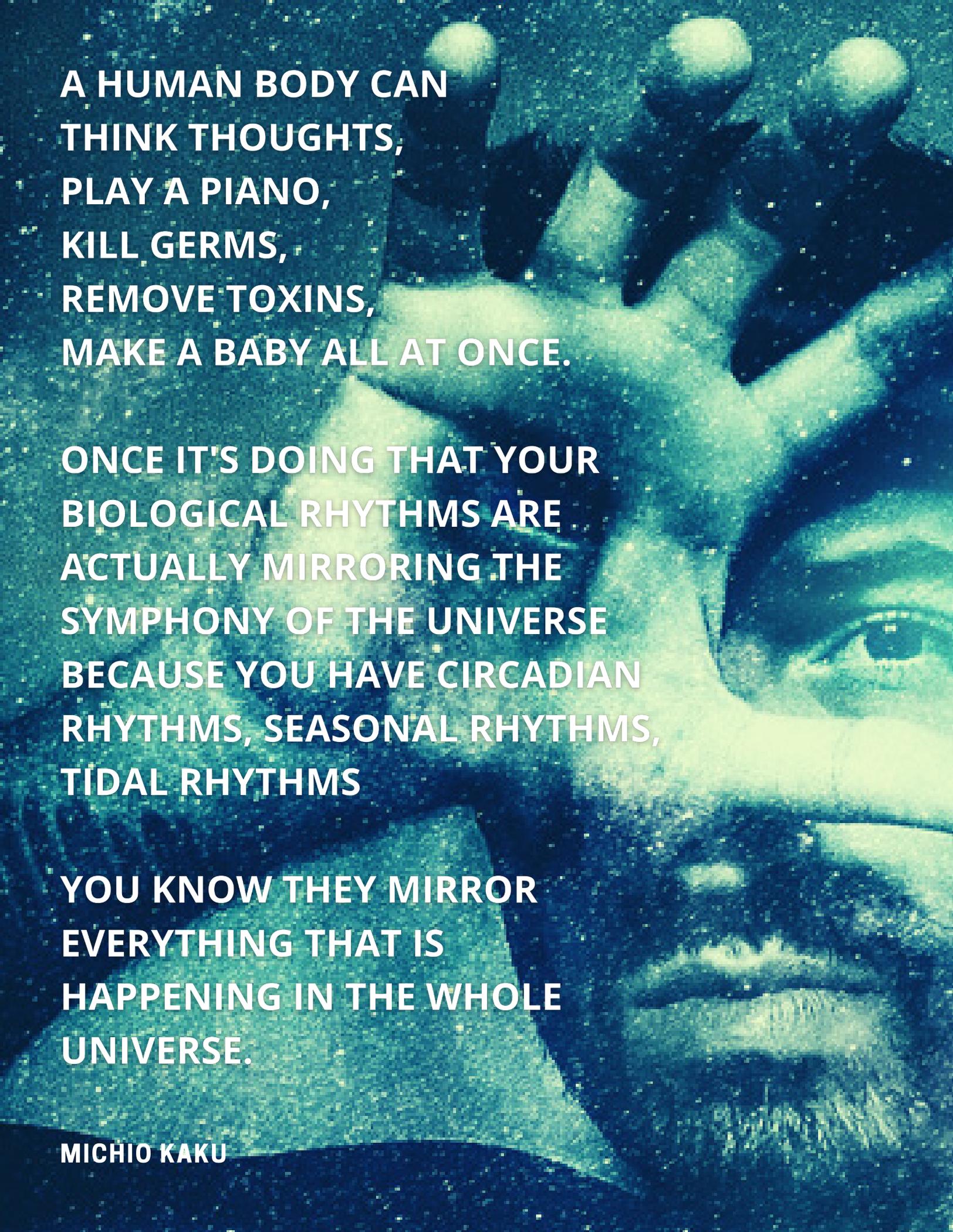
It might be useful to launch this metaphorical spacecraft into other planetary spheres, as already we see lunar cycles being likened to the physiology of the female reproductive system. Perhaps we can find medicine in the metaphor and expand our inquiry into circadian rhythms lasting more than 24 hours. Just as we understand a connection between menstrual cycles and the moon, if this line of inquiry is followed, scientists will create new models of light therapy based on the likes of Pluto and Jupiter. Doctors will incorporate the prescription of planet medicine. Birthdays will have a real place on medical history charts. And the world will no longer need daylight savings.



PERHAPS WE CAN FIND MEDICINE IN METAPHOR AND EXPAND OUR INQUIRY INTO CIRCADIAN RHYTHMS LASTING MORE THAN 24 HOURS.

REFERENCES

1. <https://www.sciencedirect.com/science/article/abs/pii/S0959438813000664>
2. [https://www.gastrojournal.org/article/S0016-5085\(16\)34832-6/pdf](https://www.gastrojournal.org/article/S0016-5085(16)34832-6/pdf)
3. <https://www.ncbi.nlm.nih.gov/pubmed/1609019>
4. <https://www.sciencedirect.com/science/article/pii/S1550413116302509>
5. <https://www.ncbi.nlm.nih.gov/pubmed/23535335>
6. http://www.chronobiology.ch/wp-content/uploads/publications/2007_02.pdf
7. <https://www.sciencedirect.com/science/article/pii/S1550413114004987>
8. <https://www.nature.com/articles/nature11048>
9. <https://www.nature.com/articles/nature11048>
10. <https://journals.physiology.org/doi/full/10.1152/physiol.00012.2011>
11. <https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0136240>
12. <https://www.nature.com/articles/nrn3393>
13. <https://www.annualreviews.org/doi/10.1146/annurev-neuro-060909-153128>
14. <https://nyaspubs.onlinelibrary.wiley.com/doi/abs/10.1111/nyas.12464>
15. <https://www.sciencedirect.com/science/article/pii/S0092867414012367>
16. <https://www.pnas.org/content/106/50/21453>
17. <https://www.sciencedirect.com/science/article/pii/S1550413114005051>
18. https://www.researchgate.net/publication/11870855_New_Issues_About_Melatonin_and_its_Effects_on_the_Digestive_System
19. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3198018/>



**A HUMAN BODY CAN
THINK THOUGHTS,
PLAY A PIANO,
KILL GERMS,
REMOVE TOXINS,
MAKE A BABY ALL AT ONCE.**

**ONCE IT'S DOING THAT YOUR
BIOLOGICAL RHYTHMS ARE
ACTUALLY MIRRORING THE
SYMPHONY OF THE UNIVERSE
BECAUSE YOU HAVE CIRCADIAN
RHYTHMS, SEASONAL RHYTHMS,
TIDAL RHYTHMS**

**YOU KNOW THEY MIRROR
EVERYTHING THAT IS
HAPPENING IN THE WHOLE
UNIVERSE.**

MICHIO KAKU

THE POWER OF POULTICES

BY
DONNAMARIE HIRST

Poultices have been used for millennia and continue to be a valued and valuable method of treating ailments for all kinds of maladies. This paper will remind us of their value and reinstate their place in our fast-paced modern world where we have all subscribed to quick-fix solutions. Its aim is to provide a greater depth of understanding on how this form of treatment can be, in some cases, a wonderful way of initial treatment that can activate the healing process for simple maladies such as bites, stings, strains, rashes, bumps, and bruises.

The art of growing herbs, harvesting, blending, preparing herbs, as well as other ingredients and applying poultices have a place in both modern herbal practices and in the home environment as well. The art and science of poultice therapy are both pleasurable and therapeutic, while proving itself through years of use, to be an effective way to treat wounds, aches, inflammation, infections, give relief and activate, stimulate and work with the body's natural healing powers.

HISTORY OF HERBS

Plants have been part of life since before humans were inhabiting planet earth. We have evolved alongside them, eating, drinking, healing with them, weaving, smoking, wearing, coloring, and painting with them. There were eight different medicinal herbs including ephedra, yarrow, groundsel, and marshmallow found in the Shanidar Cave site in Iraq, where they found 60,000-year-old Neanderthal human remains.

It is thought that the inclusion of the plants in the tomb suggests they had supernatural significance as well as medicinal value. (Kindersley, 1996) (Curator, 2006)

This supernatural, energetic, or soul nature of plants is echoed in cultures all over the world. Even Aristotle, the 4th century BC Greek philosopher thought that plants had a "psyche". In Hinduism, which dates back to at least 1500 BC, many plants are sacred to specific divinities. For example, the bael tree (*Aegle marmelos*) is said to shelter Shiva, the god of health beneath its branches. In medieval Europe, it is stated in the Doctrine of Signatures that there was a connection between how a plant looked and its medicinal uses. An example is the leaves of lungwort (*Pulmonaria Officinalis*), which were thought to resemble lung tissue and this plant is still used to treat respiratory tract issues today. (Kindersley, 1996)

Even Western cultures had beliefs in plant spirits. Until the early 20th century, British farmers would not cut down elder trees (*Sambucus nigra*) for fear of arousing the Elder Mother, the spirit who lived in and protected the tree. Similarly, native peoples of the Andes in South America believe that the coca plant (*Erythroxylum coca*) is protected by Mama Coca, a spirit who must be respected and placated if the leaves are to be harvested and used. (Kindersley, 1996)

Today, the belief in plant spirits is still strong and widely acknowledged by any who have had an ayahuasca (*Banisteriopsis caapi*) experience. There is no questioning the presence of the plant spirit and the messages she offers while in an altered state of perception. The 'veil between worlds' has been lifted. When asked how the South American people knew which plants would have the ability to dissolve the veil, they are reported to have said that the plants sing to them in a different key under a full moon.

PLANTS COMMUNICATE

Is it possible, therefore, to entertain the concept that all plants have the ability to communicate with those who have the ability to hear them? This is not that far-reaching given that our ancestors were not living the same, fast-paced life that we are. They were not spending so much time occupying their inner landscapes with sound, technology, concerns about earning, living, accumulating, achieving, and transportation. Theirs was a life more connected to the earth, the cycles, the weather patterns, the plants, and the silence between. The ability to hear the voices of the plants, learn from them the secrets of their healing powers, and how to receive those healing powers is the knowledge that has been passed from generation to generation from then until now. Many have recorded this knowledge for those who follow to benefit from and each generation of healers takes that knowledge, uses it in the ways suggested, and witnesses the healing taking place just as the generation before them and the one to follow will do. It is this knowledge that we draw on in the realm of herbalism today.



“We co-evolved with plants so we have receptor cells inside our bodies that respond specifically to chemicals in medicinal plants”

**-Lucie Bradley,
Medical Herbalist & Holistic Therapist
TIFA Faculty**

HERBS IN DAILY LIFE

With modernization, the growing, harvesting, processing, and delivery of herbs and all edible plants is very different from the times gone by. Many people today use herbal plants in one form or another on a daily basis. Their experience of herbs is in the form of tea or tisanes, that are safely contained in little disposable (often made of fine plastic) bags. Many of the herbs are still carrying chemical residues that were used in their cultivation processes. After adding hot water they are consumed, releasing those chemical residues and plastics directly into the bloodstream, adding another layer of confusion for the body to process and eliminate.

Many beauty products contain plant extracts and here again, the botanicals are suspended in a plethora of ingredients to preserve, maintain moisture, increase the slipping quality or absorbency and perfume. It takes 26 seconds for something that is applied to the surface of the skin to be absorbed into the body. Applying a poultice or compress is a wonderful way of receiving the healing powers of plants directly into the bloodstream.

Herbs and plants also enter some people's bodies in the form of vapor or smoke, essential oils, cigarettes, etc., and in cooking where culinary herbs are well known and appreciated for their ability to elevate the taste of food to a whole new level of complexity.

THE SKIN

Our skin is our largest organ acts as a permeable container. It eliminates, regulates, absorbs, protects, and communicates. Its first function is that of being a barrier but it is not simply a protective shell that contains all our systems and tissues. It is an independent organ with many, often unrecognized functions that benefit from compresses and poultices.

Tiny capillaries penetrate into every layer of the skin carrying oxygen and nutrients while also delivering toxins for release from the body in various forms. Capillaries have the ability to dilate and constrict, doubling or tripling in diameter or reducing in size to the point that even a single red blood cell cannot pass. Using poultices and other applications, it is possible to draw blood and other fluids towards the skin or send it in the opposite direction depending on the heat or lack thereof of the application. This is an incredibly valuable quality because blood plays an intrinsic role in the body, circulating nutrition, oxygen as well as toxins ready for elimination. It is a vital player in all of the body's defense processes.

The skin also contains numerous tiny muscles which, when collectively contracted, have a profound effect on blood circulation. Their ability to regulate heat, perspiration, and cellular exchange is widely studied and available for review in almost every anatomy textbook ever written. The tiny arrector pili muscles attached to hair follicles make your hair stand on end when cold or afraid, the muscles in the walls of the capillaries regulate dilation and constriction, and the smooth fibers inside the cutaneous tissue give the skin its elasticity.

SKIN AS AN ORGAN OF ELIMINATION

The skin also has an eliminatory function whereby through sudoriferous glands the skin expels sweat. Sudoriferous glands extract fluid that is laden with water-soluble toxins from the bloodstream and usher them out of the body. Their function is dependent on blood flow. Blood flow itself is highly reduced when the body is cold. Thus, the blood retreats from the skin surface.

Conversely, when the body is warm, the blood circulates more freely to the surface of the skin to help the body maintain homeostasis. The use of poultices will have either a pulling towards or pushing away (thermogenic) effect on the blood through vasoconstriction or vasodilation of the capillaries, depending on the type of poultice used.

Sebaceous glands are located at the base of the hair follicles, they excrete an oily or waxy matter called sebum containing insoluble wastes such as fats, carbohydrates, mucus, dead germ cells, and various other toxic substances. When sebaceous glands become clogged, congestion occurs resulting in a blackhead or pimple.

The basal stratum forms the third path for cutaneous elimination. It is the outermost layer of the skin, the 'shedding layer' as toxins that reach its level become trapped within cells that flatten and dehydrate, slowly separating from the body in the form of dried skin.

ASSIMILATION THROUGH THE SKIN

The assimilatory function of the skin is important as the skin is not just an organ of elimination. It is also widely known that it is able to absorb substances which is the basis of our modern multi-million dollar beauty industry. Using poultices containing clay which restores minerals to the body along with other herbs and plants, we can benefit widely from the skin's ability to assimilate and absorb to enhance healing of the body.

SKIN NERVES

The body also has a complexity of nerve supply to the skin that is responsible for identifying temperature, pressure, vibration, and contact. This network of nerves reacts to signals such as heat and cold which will cause the pores to open and close, increase or decrease circulation, increase or decrease chemical reactions, and so forth. These transformations of the skin's metabolism can be used advantageously and deliberately by the applications of poultices and other topical preparations directly upon the skin.



COMPRESS VS POULTICE

Compresses or fomentations are a cloth that has been soaked in water or other liquids. Poultices are the actual plants or other substances (e.g. clay) that are made into a paste-like consistency or bruised enough for their medicinal properties to be released in the form of liquid or plant juice and applied either directly (e.g. a cabbage leaf) or by using a cloth bag or thin piece of natural fiber cloth (e.g. linen or cotton). This is then wrapped in various other cloths, with a final wrapping of wool to both keep it in place as well as to protect clothing or bedding from becoming soiled. The two (compresses and poultices) are often referred to together as they work in similar ways and may use similar ingredients. Although compresses have previously been mentioned in this paper, this discussion will now focus specifically on poultices.

MODERN METHODS

In the past and in traditional practices, wrapping a poultice in layers of linen, cotton, and finishing it off with a final wrapping of wool was all that was available. One modern modification to this process is to use plastic wrap around the whole area to prevent the soiling of clothes or bedding. Following this layer is the woolen layer or a large towel. The addition of using plastic wrap has become more popular as it also traps heat and moisture against the skin, preventing the poultice from drying out. This thus makes the practice seem cleaner. At the end of the day, a clean poultice can make all the difference in terms of compliance, especially with first time attempts. In her synopsis, Wound Healing – from poultices to maggots, Jean Donnelly BSc, (Hons) Health Studies, RGN, O.N.C discusses the concept of moist wound healing.

“...moist wound healing is commonly attributed to the work of Dr. George Winter in 1962. Winter's research unequivocally proved that wounds heal 2-3 times quicker in a moist environment. Under dry conditions, the bed of an open wound rapidly dries out and forms a scab. New epidermal cells burrow under this scab until they locate a moist environment, so extending the healing phase...”

-Jean Donnelly, BSc, RGN, O.N.C discusses moist wound healing

Other modern inventions such as stretch or crepe bandages can be very useful in securing poultices as well as hot water bottles for keeping the heat in warm poultices. Paper towels, band-aids, and adhesive tape can also be utilized effectively in poultice applications. Further investigation is necessary to look at the inclusion of essential oils in poultices or as an application to the skin prior to introducing the poultice. This field is rich with healing possibility and diversity and would make for an interesting paper in its own right.

HOW POULTICES WORK

Poultices are made from a wide range of substances, some examples are ice cubes, earth (clay), medicinal plants (herbs, seaweed, slippery elm), vegetables (potato, cabbage, onion, carrot), fruits (lemons, apples), seeds (flax, mustard seed), animal byproducts (cottage cheese) or honey. Poultices are applied either hot or cold, depending on the desired outcome and the pathway you wish to trigger to achieve that result. The healing is achieved in four different ways: thermic, chemical, revulsive, and absorbent. Further explanation of these will follow.

The thermic effect is the primary therapeutic action used, with others layered over that to achieve deeper healing. A poultice once applied, is not the same temperature as the skin, so it causes a thermic imbalance in the body. Because the body cannot tolerate the temperature change of its tissues for extended periods, it must take action to restore homeostasis. The physiological processes that are set in motion to achieve this, form one of the bases of the healing actions of poultices. When the temperature of the poultice is much higher or lower than the surrounding tissue, the reaction by the body will be greater. Another factor is the size of the poultice, if it covers a larger portion of the body, this will demand a greater effort by the body to restore balance. Also of significance, is the length of time the poultice remains on the skin.

COLD POULTICE

The body's reaction to a cold application is twofold and is called the Hunting reaction. First, the body tightens its tissues to the maximum extent possible to reject and protect against the attack of the cold temperature. The capillaries constrict (vasoconstriction) which forces blood into the deeper tissues, away from the surface of the skin. During this phase, cutaneous circulation is reduced considerably thereby reducing oxygen, combustion, elimination, and nutrient flow to and away from skin cells. This stage is relatively short as the body must react quickly to restore the proper level of heat to the cutaneous tissues and strive to change the temperature of the source of the cold onslaught.

This is where the second stage begins (vasodilation), the reactive, withdrawal stage is replaced by a flood as massive amounts of blood are drawn into the skin's blood capillary network. The capillaries dilate, filling with warm blood, circulation becomes rapid and intense, constantly replacing the blood that has lost its heat in the skin. Now the cells begin receiving the oxygen and nutrients that were moments prior, unavailable as the body attempts to restore warmth and protect itself against the source of the cold attack. (Vasey, 2019)

The healing effect is caused by the fact that the ailing cells are now better oxygenated and nourished and the increased metabolic speed has flushed out the toxins that caused the initial imbalance. Because of this intensified circulatory efficiency, lymphocytes from the immune system and healing substances from glands (anti-inflammatory substances, hormones, etc) are now more readily available and plentiful.

WARM/HOT POULTICE

When a warm poultice is applied, the body does not go through the first phase that was described above. Instead, because of the direct delivery of heat, it goes straight into the second stage of cutaneous metabolic reactions. The strength of this acceleration is directly proportionate to the degree of heat applied. It requires smaller amounts of energetic input from the body than a cold application would do and therefore is more suitable for people with lower vitality or those who have been weakened by illness or age. Hot or warm applications are recommended for warming cold areas (chilled extremities, degenerative arthritis), loosening areas that are stiff (joints) or contracted (spasms), and accelerating sluggishness.

A cold application chills heat (soothes inflammation), causes what is dilated to contract (unblocks congested tissues), slows what has accelerated (hyperfunctioning glandular or another system), and calms pain (anesthetic effect). Surprisingly, a cold application that is applied for a long duration will have the same effect as a hot application. The body is more capable of reheating tissues that have been attacked by the cold. This process takes some time to establish but once in place, it is much more intense because it has been actively produced by the body itself. Given the fact that it requires significant energy reserves to confront the cold, these long, cold applications are only recommended for individuals who have high levels of vitality. (Christopher Vasey, 2019)

The therapeutic success of poultices can also be attributed to the skin's assimilatory capacity. Because the skin has such an ability to absorb, applying vitamins and minerals from fruits, vegetables, and clay; active properties of medicinal plants; softening properties of flaxseed or slippery elm mucilage; disinfectant properties of onions, drawing properties of potatoes, etc. are highly useful to the healing process. In most cases, the action of the medicinal properties contained in the poultice itself, combined with the temperature of the application, account for poultice efficacy in healing.

REVULSIVE POULTICES

Some poultices are termed revulsive poultices. These are poultices that contain ingredients like mustard or cayenne pepper which have an irritating effect on the skin. If they are left on the skin for an extended period of time, they can cause blistering or burning.

When used in poultices, revulsive substances are used to artificially trigger a healing process. Their presence causes the skin to react to the irritation by drawing large amounts of blood into itself to better irrigate the tissues so that the irritating substances can be neutralized and expelled from the body more easily.

The duration of a revulsive poultice is therefore quite short. Long enough for the attack to be felt by the body and the defensive process to commence but not so long as to cause injury. The sensitive handling of these poultices is worthwhile as it is possible to quickly direct an intensified healing reaction to a given part of the body by using them.

The effects are not just restricted to the surface but reach deeper into the body. As the surface tissues become congested with the influx of blood, the deeper tissues become decongested. The blood leaves the depths and rises towards the skin carrying the toxins that will be easily eliminated by the skin once they reach it. Revulsive poultices are used to treat poorly irrigated deep tissues such as joints (arthritis, rheumatism) or to bring rapid relief to an organ encumbered by wastes. One example would be the lungs in the case of asthma.

DRAWING POULTICES

Drawing poultices are known for their powers of absorption and suction. Poultices made from cabbage leaves or clay are well known in this realm. They have the ability to absorb toxins that are lying stagnant in the tissues. This suction action takes place through the entire thickness of the skin, into the deepest layers of tissue. This process may not happen with just one poultice application. Repeated applications are required so that with each application toxins are removed in a layering type effect. Firstly, those closest to the skin which allows subsequent applications to draw from deeper and deeper in the body. Clay and cabbage poultices work regardless of their temperature but a greater effect is achieved by adding the element of temperature to the poultice.

The most obvious use of these kinds of poultices would be acne, boils, abscesses, skin ulcers, mastitis, and so on. The applications need to be renewed frequently to avoid toxins being reabsorbed into the body. Cabbage leaves, for this reason, will smell rotten and seem wilted and cooked by this process of toxin absorption and need to be re-applied frequently until the toxicity has lessened and healing is restored.

MUCILAGE

Often herbs that have been ground into a paste for the purpose of a poultice will be mixed with flaxseed or slippery elm powder. As well as maintaining moisture in the poultice and therefore at the surface of the skin, this is also an important way to fashion poultices where they will be applied in cases where the pus should continue to flow, an astringent (or an aid that would stop the flow) should not be used. The mucilage will also give the body a herbal paste helping it to stick together and stay in place when used on an area prone to movement (knee or ankle) or gravity. A hot poultice can be prepared with apple cider vinegar (which is good with almost all herbs). If no vinegar is available, using hot water is acceptable. (Christopher, 1996)



GROWING HERBS

“Medicinal plants are not only free but also embarrassingly abundant. As so many of them could be classed amongst common ‘weeds’ they don’t even need the minimum care of planting and watering – let alone fertilizing! And I’ve never heard of anyone buying dandelions from their nursery, so there’s not even an initial cash outlay. Give it serious thought when looking with new eyes at the unweeded garden and the waste ground. Amongst the tangle of weeds may be the remedy for your aching back, your irritable colon, or your under-functioning left kidney”. (Hall, 1988)

Herbs are surprisingly easy to grow, some don’t need much in the way of tending and will survive even the tidiest gardener. The easiest way to start is to decide which herbs you would be interested in incorporating into your life. This decision can be made based on their medicinal attributes, their culinary uses, taste preferences, their flavor in herbal teas, or their ability to grow in your local area.

Herbs from the Lamiaceae family such as mints, oregano, marjoram, sage, rosemary, basil, lavender, and savory are all culinary favorites and are very easy to grow in the kitchen garden or on the balcony. Some care is needed as some plants in this family can be invasive (e.g. mints) and are better to grow in pots rather than in the garden itself. Once the decision has been made, a trip to the local nursery will ensure seedlings of good quality and also offer the added benefit of staff members who can answer any questions.

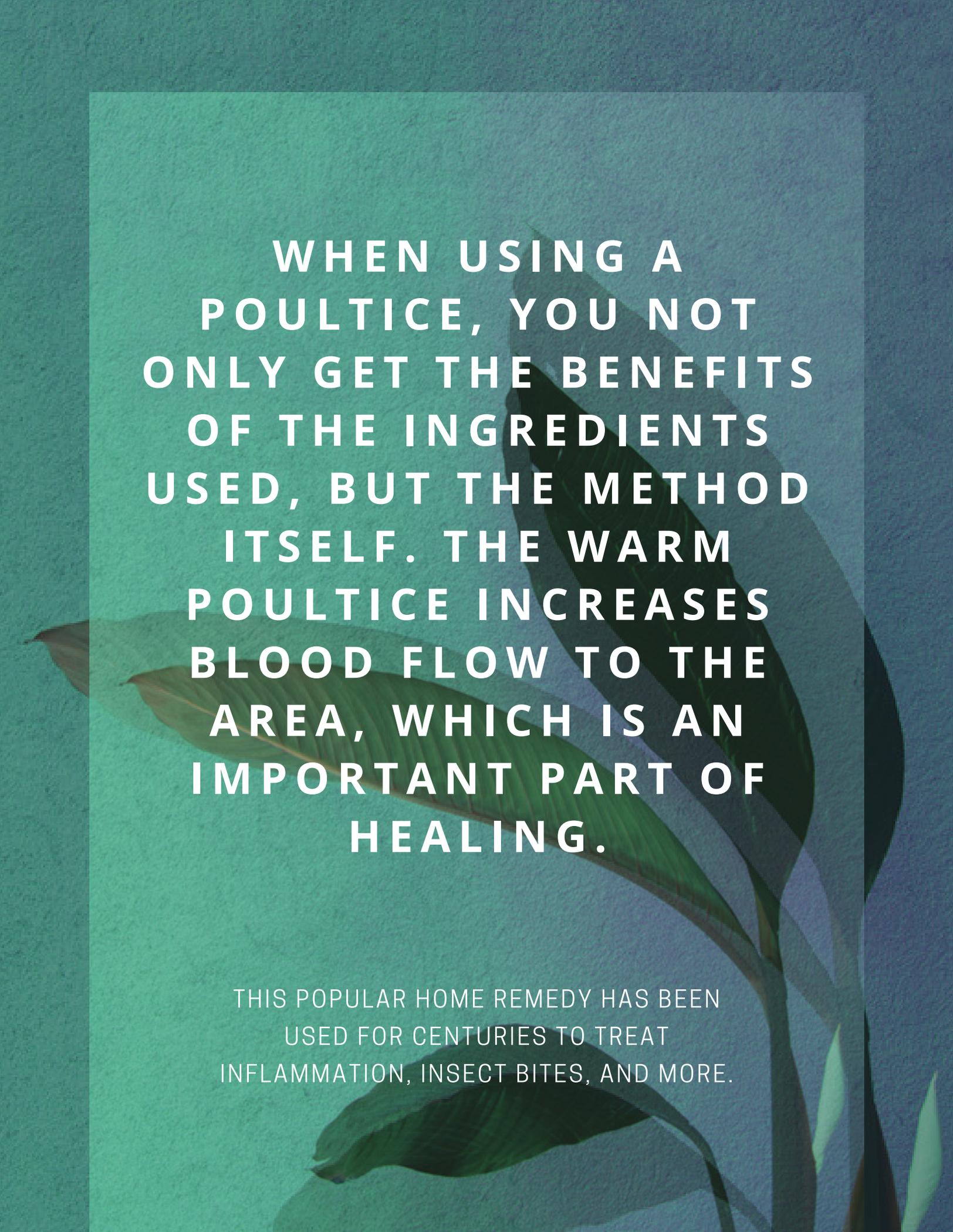
YOUR SEEDLING NEEDS TO BE IN POT SIZE AND A LOCATION THAT IS ADEQUATE FOR ITS GROWING PREFERENCES E.G. SUNNY, SHELTERED, OR PROTECTED, AND THEN FROM THERE, IT’S JUST WATER, OCCASIONAL FEEDING, AND SUNLIGHT.

Having these plants on hand is invaluable as you can never predict when they will be needed and although dried plants can work for poultices, the fresh plant will grind into a paste more readily, releasing its healing powers with greater potency. Dried herbs may have been stored incorrectly, dried at higher than optimum temperatures have been on the shelf for just long enough for their therapeutic properties to have diminished, or been grown commercially where chemicals were used somewhere in their growth cycle. Once the basics of growing your own herbs have been mastered and if space permits, the addition of other medicinal plants to the home garden can be both pleasurable and relatively simple (e.g. comfrey).

Another helpful and responsible action is to learn to botanically identify plants already growing in your garden or nearby along with their medicinal helpfulness (e.g. plantain, dandelion). This practice will be a lifelong gift that will be useful in all kinds of situations. An example is to be able to identify at a glance, nettles *Urtica dioica* which have so many benefits medicinally and nutritionally, but if touched with bare skin, they will give an uncomfortable sting. Wherever nettles are found, growing nearby will be a plant from the *Rumex* family, commonly known as Dock. Nettle stings can be relieved by rubbing a dock leaf vigorously over the area. The knowledge of how to identify both these common weeds may potentially relieve many an upset child or adult after an accidental encounter.

“A poultice is made by crushing the fresh herbs and binding directly onto the affected part of the body. They relieve pain and promote local healing of injuries, cuts, and fractures. A common poultice is made from comfreyb root and plantain, with a sprinkle of cayenne pepper to activate its healing potential”. - Dr. Michael Tierra CA, 1992





**WHEN USING A
POULTICE, YOU NOT
ONLY GET THE BENEFITS
OF THE INGREDIENTS
USED, BUT THE METHOD
ITSELF. THE WARM
POULTICE INCREASES
BLOOD FLOW TO THE
AREA, WHICH IS AN
IMPORTANT PART OF
HEALING.**

THIS POPULAR HOME REMEDY HAS BEEN
USED FOR CENTURIES TO TREAT
INFLAMMATION, INSECT BITES, AND MORE.

Method of Preparing Herbs

Poultices can be made from mashed, pulverized (using a mortar and pestle or simply take the herb between the hands and rub together to bruise and release its healing properties) or finely chopped herbs and other ingredients found in the home kitchen. Some poultices are successfully applied from herbs that have been chewed without swallowing their juice and applying directly to the skin – this is especially effective for stings and bites when out in nature. They have the potential to facilitate the body's natural ability to heal itself of bruises, sores, bites, stings strains, and other minor ailments. It is always advised to seek medical advice if the condition does not clear up quickly.

Simple instructions for a basic poultice would be to take a handful of your herbs and chop them into a clean bowl. Add a small amount of boiling water and mash to a thick pulp with the back of a spoon.

At this point, there is a choice to apply the herb mixture directly to the skin surface and cover. This application is useful where the skin is intact and there is no chance of the herbs entering into an open wound (bruise or strain).

The second option is to place a piece of gauze over an open wound and apply the herbal mix on top, covering this with another layer of gauze, wrapping it with cotton to keep in place. This method is more suitable for an area where the integrity of the skin has been compromised in any way (sores, ulcers, bites, or stings).

The third option is to place the herbal mixture into a square of natural fiber fabric, creating a pouch or bag that is tied off at the top and then applied to the surface of the skin. This method is useful for a poultice that needs to be removed to check the condition of the skin (if it contains revulsive ingredients) or for a poultice that will be re-used, re-heated or re-cooled. Due to the size of this poultice method (thickness), it will retain heat or cold temperatures for longer periods of time.

Bruises, Stings, Strains, Insect bites & Inflammation

Many people have been using a simple poultice for years without realizing that it can be termed a 'poultice'. Ice is an invaluable remedy for strains, stings, insect bites, and bruises. Take a plastic zip lock bag and place some ice cubes inside it. Wrap the bag in a cloth – a tea towel is a great option and then place it directly on the site of the injury. The duration of application will vary depending on the injury. Leave in place for as long as it continues to have a calming, relieving, or pleasant effect (5 -15 minutes). In the case of swelling, further applications may be required but for stings and bites usually, a single application should suffice.

Other common herbs that are effective for insect bites and stings are parsley, plantain, thyme, and rue. A very quick and simple solution to an insect bite or sting is to chew up some plantain or comfrey leaves in the mouth (without swallowing the saliva) make it into a soft mass and apply the pulp and juice to the wound immediately. Cover with a bandage or plaster (here is where the use of plastic may be of benefit to keep the mass moist) and wrap to keep it in place. Repeat this application at regular intervals over the next few hours or until the herbs have had the time to draw the poison out or the discomfort has reduced. (Christopher, 1996).

Bruises and Sprains

A handful of fresh comfrey leaves roughly chopped with scissors. Add a little boiling water and mash with the back of a spoon into a thick pulp. Leave to cool slightly and spread directly on to the affected area. Cover lightly with gauze and then bandage to hold the poultice in place. Leave on for several hours. (Houdret, 2002)

Boils

Grated ginger can be warmed slightly with warm water or applied as is due to its heating effect. Depending on the size of the boil, it may be possible to use plaster or necessary to make up a larger poultice. The use of the plastic wrap here will keep the heating effect of the ginger and surrounding tissue active for longer however if this is not possible due to the location of the boil, just a plaster or gauze wrapped with a woolen cloth will also be of benefit.minimized.

Conclusion

There are many options for simple poultices that can be used in first aid and beyond. The writer's experiments with poultices have been in the realm of ginger poultices to warm the kidneys, potato poultices for inflammation or swelling, comfrey poultices for strains, plantain plasters for children when stung or after insect bites.

For you, the reader, experimentation with plants growing nearby and ingredients from your pantry or refrigerator is both pleasurable and highly encouraged. The world of plants is accessible to all, from plants growing in your back yard or the local park to those found in the supermarket or health food store, our body responds to the healing properties of plants, it's how we evolved and will continue to evolve. The plant kingdom is almost begging for us to notice and incorporate its gifts into our lives. Just look at plantain, a plant that is highly effective at treating bites and stings and it grows freely nearby wherever humans dwell.

For a more in-depth investigation into poultices and their recipes, applications, and uses, consider reading 'MakingHerbal Poultices, Compresses & Liniments. Making Herbal Remedies at Home Series Vol 1' by Robin Nelson- Shellenbarger or 'Natural Compresses & Poultices. Safe and Simple Folk Medicine Treatments for 70 Common Conditions' by Christopher Vasey. ND



THE HISTORY OF WHEATGRASS

BY FLORINA BERGMANN

FANCY WHEATGRASS TREND...

One of the new diet trends and well promoted from the fad food industry is the use of wheatgrass.

It belongs to the family of sweet grasses. As we know lots of companies are selling wheatgrass or barley grass as a powerful intake to gain more health. It is highly promoted as one of the “Superfoods” and a secret tool to boost health.

Wheatgrass products are sold in many different forms like powders, tablets and fresh juice. Even the whole plant is available for purchase.

You can buy wheatgrass products in almost all of the nutritional supplements shops as well as in organic groceries. But is there real evidence to prove the powerful health benefits of wheatgrass? Or is it just another fancy craze? Let’s go on a journey together where we might find some evidence to prove or refute it.

WHAT IS WHEATGRASS?

Wheatgrass belongs to the sweet grasses (Poaceae = Gramineae) plant family. With about 12,000 species in around 780 genera, they are one of the largest families within the flowering plants. They are distributed worldwide in all climates and are characterized by a typical grass-like shape.

The origins of the use of wheatgerm in nephropathy is uncertain. It may have already been used in the ancient Far East & among shamanic tribes in Europe and Asia.

If we look at the huge amount of disease in today's civilization, we have to make the connection to our diet, which unlike ever before, is highly based on grain consumption. Is the human physiology able to digest grains properly?

All cereals such as rye, barley, oats, millet, corn, and rice belong to this group of plants. Wheatgrass, unsurprisingly, is the young grass stage of the wheat plant, harvested just 6-10 days after sprouting. Its botanical name is *Triticum aestivum*. However, humans have evolved through the millenniums and have adapted to different challenges like the cold climate. Also, we have learned to cultivate different varieties of sweet grasses and later harvest the grains in order to provide food for the winter.

RENOWN FRUITS OF CEREAL GRASSES

If we are looking at the huge amount of today's civilization diseases we truly have to make the connection and look at our diet, which is based on largely grain consumption.

Is human physiology able to digest grains properly? There is evidence that shows that even people who do not suffer from celiac disease are creating some kind of inflammation when eating grain. When we look for the real seed eaters we find them in the bird kingdom because they can store the seeds in their goiter for 4 to 17 hours in order to make them digestible.

Also, we have to admit that the way we are cultivating grains nowadays and the way we process them is dubious. It is a large industry where we mono culture certain cereal grasses by using lots of pesticides which results in a soil highly deficient in nutrients. The cultivation of cereal grasses transforms the natural DNA (the building blocks of life) of the grass seeds into mutated DNA. Human genes are unlikely to be able to adapt to these new proteins. Conclusions can be drawn that indicates very clearly that especially today's grain and the way we consume it has an inflammatory effect on the human organism.

SWEET GRASS THROUGH HUMAN HISTORY

The origins of the use of wheat germ in nephropathy cannot be clarified with certainty. There are many indications that it already has been used in the ancient Far East and among shamanistic tribes in Europe and Asia.

Many types of sweetgrass are among the oldest crops on our planet. If we look at human history, we discover that people in some of the world's earliest cultivated areas, such as Egypt and China, started growing grain (cereal grasses) only about 10,000 years ago.

Before this time we were living and eating as primates do, which is primarily leafy greens and fruits. The primeval people did not know about grain! They might occasionally have eaten some fresh grass seeds. This can be deduced from the eating habits of wild gorillas. Foods rich in chlorophyll are the major dietary staple of primates.



A very interesting observation in this context can be made with carnivores who also sometimes intake grasses. Especially when not feeling well.

However, wheatgrass is harvested in a young state before the grain is produced. Therefore, it does not contain any gliadin (gluten) - and is very high in chlorophyll. As already mentioned, a fruit and chlorophyll rich diet has been the basis of our primitive ancestors.

But is fresh grass actually digestible for humans? Let's make a comparison between cow and human.

On earth, all plants consist mainly of long-chain carbohydrates in the form of glucose (dextrose). The decisive factor here is how the individual glucose molecules are connected.

It is either in the form of starch ("alpha-glycosidic compound") or cellulose ("beta-glycosidic compound").

In the human body, enzymes are responsible for breaking down long-chain carbohydrates (such as glucose) to produce energy. However, the body's own enzymes can only digest starch. On the other hand, it cannot break down cellulose. Thus, cellulose components are excreted unchanged and can cause irritation in excessive amounts, such as flatulence, abdominal pain and nausea.

Grasses consist largely of cellulose. A cow has four stomachs and chews the grass several times with the help of their rumen (and the microorganisms living in it). Therefore they can break down the cellulose and obtain glucose from it.

With this knowledge it seems that eating raw grass is not very suitable for human consumption.

If at this point someone is wondering what about other animals like rabbits or horses that are not ruminants? Well, here too the difference lies in their current bacteria.

But still, a very interesting observation in this context can be made with carnivores who also sometimes intake grasses. Especially when not feeling so well. Is this maybe an indication that grasses provide medicinal and protective substances?

There are many people who use various kinds of sweet grasses and describe it as very beneficial for health.



MODERN HISTORY OF WHEATGRASS

The Pioneers: Dr. Schnabel & Ann Wigmore

Charles Franklin Schnabel (1895-1974) known as the "father of wheatgrass" was an American agricultural chemist. Before his discovery of the nutritional density of wheatgrass and other cereal grasses, the primary purpose of his research was to determine the value of various animal feeds to see which would produce the best results for livestock. He made experiments with young grasses in 1930, when he used fresh cut grass in an attempt to nurse dying chickens back to health. The hens not only recovered, but they produced eggs at a higher rate than healthy hens.

He did various animal experiments and the results encouraged him, so he began drying and powdering grass for his family and neighbours to supplement their diets and achieved the same results. He invented the first "multi-vitamin" which was sold as a food. It was a blend of wheatgrass and other cereal grasses. It became an extremely successful product and was sold by pharmacies throughout the United States.

Ann Wigmore (1909 - 1994) was born in Lithuania in 1909 and grew up with her grandmother who was a healer and used the healing power of grasses. At the age of 52 she was diagnosed with colon cancer. She remembered her grandmother's knowledge of using freshly squeezed wheatgrass juice to heal diseases. Through the daily intake of fresh grass juice and a diet of exclusively fresh plant food she became completely healthy again. From this deep embodied experience, Wigmore conceived a vital food program to cure serious illnesses. She went on to found several health institutes, which still today, focus on freshly pressed wheatgrass juice. She is the founder of the "Living Foods Lifestyle" and published several books for example "Be your own doctor".

Dr. Schnabel and Ann Wigmore are not the only ones in modern history who have researched and described wheatgrass as a powerful tool to gain health. Another example was Franz Konz (1926 - 2013) the founder of "original medicine" (UrMedizin) who promoted a more natural lifestyle, as well as the healing power of wild grass. He claimed to have healed his stomach cancer through living and eating as nature originally intended and by using the healing benefits of grass.

If you start to investigate you will find many success stories of people who swear by the healing potential of cereal grasses and their wild relatives. Danny McDonald's story is another. He decided against the recommended treatment of the doctors and cured his stomach cancer with the power of wheatgrass. He said that already after the first week of juicing, he felt significantly better. Could this just be a placebo effect or the result of a lifestyle change when people report that they healed cancer with the use of grass? Is there valid and reliable evidence?

RESULTS OF THERAPEUTIC EFFECTS

RELIEF OF OXIDATIVE STRESS

Some studies show that wheatgrass seems to be high in antioxidants. These help to eliminate free radicals, which arise from stress, an unhealthy diet or environmental toxins, among other things. Too many of these free radicals can lead to so-called "oxidative stress" and damage the cells. Antioxidants are said to be a miracle weapon against aging and diseases such as cancer.

A pilot study specifically investigated the antioxidant properties of spirulina in comparison to wheatgrass and its association with oxidative stress. It was a randomized, double-blind, placebo-controlled study with 30 participants. The results indicated that wheatgrass reduced oxidative stress whereas spirulina was not proven to have similar effects. This was also shown in mice studies as well as chemical investigations of nutritional qualities.

WHEATGRASS & DIGESTION

Wheatgrass juice should not only help you get your digestion back on track. It is also said to help with gastrointestinal disorders such as ulcerative colitis. Symptoms of this disease can include severe bowel pain, painful bowel movements, diarrhea, and even bleeding.

A pilot study published in "the Scandinavian Journal of Gastroenterology", among others, documents that ulcerative colitis (chronic inflammation of the colon) subsides significantly with the treatment of wheatgrass. 21 patients were treated either with a placebo or with 100 ml of wheatgrass juice for one month. In the patients who received wheatgrass juice, the uncomfortable symptoms such as bleeding subsided significantly. So it can be assumed that wheat grass is suitable as a remedy for distal ulcerative colitis.

Either the high proportion of antioxidants or the strong basic effect of wheatgrass or both effects are responsible for this. So far, critics have pointed to the low number of subjects in this study.

WHEATGRASS AND CANCER

Vitro laboratory studies, mostly using the fermented wheat germ extract, have shown an anti-cancer potential. This could also be shown in various animal experiments, as well as a cancer-preventive effect and a good complement to cancer treatment. Clinical studies with chemotherapy patients point out that wheatgrass may be able to reduce the toxic side effects of the treatment.

“Wheatgrass is quite rich in chlorophyll and enzymes. The chlorophyll molecule is similar to human hemoglobin. The only difference is that the central element of chlorophyll is magnesium, while the central element of hemoglobin is iron. For this reason it is called green blood.

When chlorophyll is used regularly for 10-16 days, the amount of red blood cells is increased by 70-83%. Liquid chlorophyll within the wheatgrass juice can wash out the drug related residues from the human body.”

(INTERNATIONAL CONGRESS ON MEDICINAL AND AROMATIC PLANTS: MAY 10-12, 2017/P. 516)

“Chlorophyll will be the main protein in the coming enlightened age.

In the freshly prepared drink, it contains condensed sunshine and the electrical current required to revitalize the body, and it will open up parts of the brain that humans do not yet know about. ”

ANN WIGMORE

CONCLUSION

In the end, we can conclude that there is some evidence which may indicate that wheatgrass, as well as the family of sweet grasses do provide health benefits. However, admittedly, all of the studies were small and there were a number of methodological problems.

The benefits identified in clinical trials need to be demonstrated in larger studies before conclusive claims can be made.

This article calls to do further and larger investigations in this field to provide reliable and valid evidence for using wheatgrass as a medical remedy.



REFERENCES

DER GROÙE GESUNDHEITS-KONZ“ Franz Konz

GESUND GRÜN ESSEN“ Silke Leopold

BE YOUR OWN DOCTOR“ Ann Wigmore

Die Urkraft der Gräser : <http://www.derwegzurrohkost.de/Nahrung/Gras/Gras1.html>

Columbia Researchers Find Biological Explanation for Wheat Sensitivity: <https://www.cuimc.columbia.edu/news/columbia-researchers-find-biological-explanation-wheat-sensitivity-0>

BLOG vom 08.06.2013 Recherchen 6: Warum essen wir Salate, aber kein Gras? : <https://www.textatelier.com/index.php?id=996&blognr=4715>

Einwand: Wir Menschen sind doch keine Kühe und essen kein Gras : <https://graspulver.de/grosse-beitragsserie-einwaende-und-irrtuemer-rund-um-weizengras-und-gerstengraspulver/>

Cellulose: <https://de.wikipedia.org/wiki/Cellulose>

The Discovery and Development of Cerophyl: <https://cerophyl.net/about-cerophyl/74-jähriger-Krebspatient-heilte-sich-selbst-mit-Weizengrassaft> <https://www.selbsteilung-online.com/wp-content/uploads/2019/08/3-Weizengras-Danny-McDonald.pdf>

Green blood: “wheatgrass juice (INTERNATIONAL CONGRESS ON MEDICINAL AND AROMATIC PLANTS, MAY 2017)

https://www.researchgate.net/profile/Hasan_Kozan/publication/322420166_I-INTERNATIONAL_CONGRESS_on-MEDICINAL_and_AROMATIC_PLANTS_NATURAL_and_HEALTHY_LIFE_PROCEEDINGS_BOOK/links/5a5872b945851529a2eedd01/I-INTERNATIONAL-CONGRESS-on-MEDICINAL-and-AROMATIC-PLANTS-NATURAL-and-HEALTHY-LIFE-PROCEEDINGS-BOOK.pdf#page=516

STUDIES

Intestinal cell damage and systemic immune activation in individuals reporting sensitivity to wheat in the absence of coeliac disease

(SMALL BOWEL, JULY 2016) <https://gut.bmj.com/content/gutjnl/65/12/1930.full.pdf>

Nutritional Quality and Antioxidant Activity of Wheatgrass

(JOURNAL OF FOOD SCIENCE, JULY 2018)

https://www.researchgate.net/publication/326698819_Nutritional_Quality_and_Antioxidant_Activity_of_Wheatgrass_Triticum_aestivum_Unwrap_by_Proteome_Profiling_and_DPPH_and_FRAP_assays

(JOURNAL OF FOOD SCIENCE, AUGUST 2018)

<https://www.ncbi.nlm.nih.gov/pubmed/30059150>

Wheat Grass supplementation decreases Oxidative Stress in healthy Subjects: A Comparative study with Spirulina

(JOURNAL OF ALTERNATIVE AND COMPLEMENTARY, 2007)

<https://weizen-gras-saft.ch/wp-content/uploads/2018/02/Wheat-grass-supplementation-decreases-oxidative-stress-in-healthy-subjects-a-comparative-study-with-spirulina-1.pdf>

Investigation of Antigenotoxic Potential of Wheatgrass (Triticum aestivum) Powder on

Cyclophosphamide Induced Genotoxicity and Oxidative Stress in Mice (

(AUSTIN JOURNAL OF PHARMACOLOGY AND THERAPEUTICS, NOVEMBER 2017)

<https://documents.pub/document/investigation-of-antigenotoxic-potential-of-wheatgrass-a-potential-of-wheatgrass.html>

Wheat Grass juice in the Treatment of Active Distal Ulcerative Colitis: A Randomized Double-blind Placebo-controlled Trial.

(SCANDINAVIAN JOURNAL OF GASTROENTEROLOGY, APRIL 2002) <https://www.ncbi.nlm.nih.gov/pubmed/11989836>

Wheatgrass: Green Blood can help to Fight Cancer. (Journal of clinical and diagnostic research, June 2017)

<https://www.ncbi.nlm.nih.gov/pubmed/28764290>

Wheat Grass Juice May Improve Hematological Toxicity Related to Chemotherapy in Breast Cancer

Patients (NUTRITION AND CANCER, 2007) <https://weizen-gras-saft.ch/wp-content/uploads/2018/02/Wheat-Grass-Juice-May-Improve-Hematological-Toxicity-Related-to-Chemotherapy-in-Breast-Cancer-Patients-A-P.pdf>

A close-up photograph of several green wheatgrass stalks, showing their characteristic segmented structure and vibrant green color. The stalks are slightly out of focus, creating a soft, natural background for the text.

**WHEATGRASS
IS PACKED
WITH A
POWERFUL
COMBINATION
OF NUTRIENTS
THAT MAKE IT
EXTREMELY
USEFUL TO
YOUR HEALTH.**

Health enthusiasts have long raved about the countless benefits of this plant, and for good reason. It can be used as an everyday health tonic and may even help treat specific diseases.



CAN NATURAL MEDICINE HELP IN TRANSGENDER SEX CHANGES?

BY ELISA MASSARI



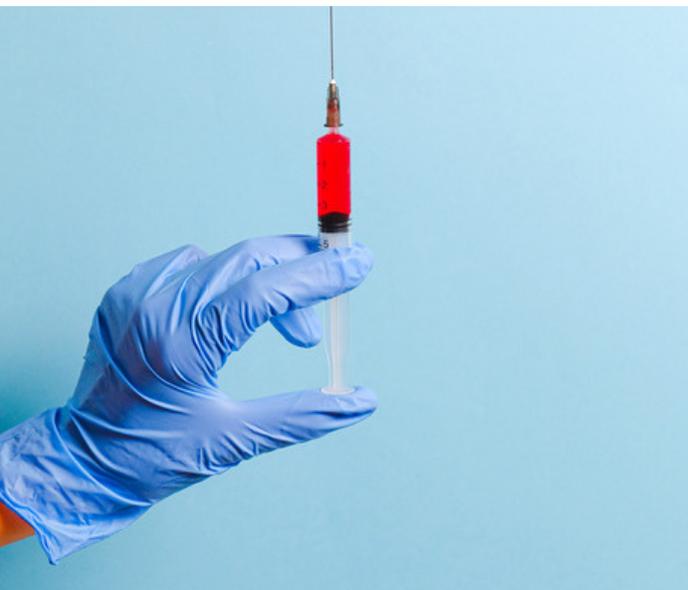
HISTORICAL PERSPECTIVE (1)

Signs of the existence of what we define today as gender non-conforming identities have been found throughout the history of mankind. In many, if not all early indigenous cultures, there was a third gender category. This often included what we define today as transgender, intersex, and eunuchs. Some form of the third gender existed amongst the Itelmens in Siberia (koekchuch), in Samoa (faàafine), in the Indian subcontinent hijiras, which have been legally recognized as a third gender in 2014 (2), in the Northern American Tribes of the Navajo (nádleeahi) and Zuni (lhamana), in Thailand (kathoey), Arabia (mukhannathun, today khanith), pre-Columbian civilizations, Africa, Ancient Egypt, ancient China, and Japan, just to mention a few.

Documents as old as 4500 years describe transgender or transvestite priests that operated amongst the Sumerian (gala) and during Akkadian period (kurgarrū). Similarly, in ancient Greece, Rome and Phrygia there were transgender priests called Galli, and in the Philippines cross-gender shamans (bayog). Religious iconography and early representation of gods and goddesses were often androgynous or, like for some Egyptian goddesses, with an erect male genital organ. In many ancient texts like Mahābhārata (Sanskrit epic) or others from Thailand and Europe, tales of trans men and women were narrated.

Graves found with biologically male skeletons in women's dresses and with feminine grave goods, and vice-versa, demonstrate that specific burial ceremonies and costumes have been discovered historically. On the African continent amongst the Nuba of Sudan, Swahili-speaking in Kenya, and some Bantu people of South Africa, male assigned people at birth were able to marry a man and take feminine roles. Historians have reported that Elagabalus, a Roman Emperor, desired genital reassignment surgery.

As the modern era approached in Europe, artistic expression, accounts, and books confirm the presence of gender non conforming individuals, throughout all the middle ages and beyond.



“Whilst there are archetypal differences between the masculine and the feminine, the deeper issues are not about men and women [rather it is about] collaboration of Masculine and Feminine as equals, and without hierarchy.”

-Daniel Giamario, Director of the Shamanic Astrology Mystery School and Creator of the Shamanic Astrology Paradigm

A poem written to lament the fact despite being a boy, desired a body modification, a report of the London Police arresting a prostitute dressed as a woman but with a male body, and countless stories of women that behaved like men and joined the army, sworn virgins in the Balkans and men that self-identified as women and lived their lives accordingly highlights the diversity of this topic.

From the 16th century, with the arrival of the Spanish, the massive suppression of native customs, and with the beginning of a colonial era, many of this indigenous culture specificity has been destroyed. During modern age culture, gender identity has been polarized, often using the law to make other expressions of gender identity illegal. The current situation for transgender people might be known. While in some countries more rights and easier access to hormone replacement therapy are being granted, some other transgender populations are being harshly persecuted.

The existence of an energetic polarity that sees at the extremes of the spectrum masculine and feminine does not exclude the millions of nuances in between. As Daniel Giamario clearly puts it:

“Whilst there are archetypal differences between the masculine and the feminine, the deeper issues are not about men and women [...] collaboration of Masculine and Feminine as equals, and without hierarchy.”(3)

BEING TRANSGENDER TODAY

With regards to the first paragraph and given the recent creation of the term transgender (around the mid-90s), the cultural nature of the concept of gender appears clear. It might be connected with the never-ending necessity to identify and label what was, and still is, a person that defies the (gender) system of norms that have been established in modern society.

Well explained in the book *Lesbian, Gay, Bisexual, and Transgender Aging. Research and Clinical Perspectives*: “For most of us, the baseline on which many of these categories are built in the genitals: If someone has a penis, he’s male; a vagina, and she’s female. Transgender and intersex people challenge these baseline assumptions, which is one of the reasons they are subject to so much hostility, not only from the heterosexual, gender-normative majority but also from gay and lesbian people. Constantly navigating that hostility is one of the primary tasks of transgender and intersex...” (4)

Gender identity can be defined as a sense of self that differs from and does not depend on the biology of the body. Such perception of the self can cause in the individuals a lot of distress and a high disconnection from their gender image and has been defined in western psychiatric medicine as gender dysphoria.

It might be useful to point out that the term transgender is used as an umbrella, and includes a spectrum of gender identities (gender nonconforming, gender-affirming, two-spirit, three spirits,s, etc; not everyone who has a nonbinary identity identifies with that term) that could not fit in the binary gender system that virtually all humans have been educated to in the last centuries.

Considering self-identity is such an intimate, individual, and delicate matter, it is rather interesting to observe that, in the majority of the countries where the law has acknowledged the existence of transgender people (many countries in the world have not), the process to have access to full recognition of the not-conform-to-the-anatomical-gender-of-birth self by the institutions takes years, trials and recommendations from psychotherapists.





To quote from Ruth Pearce's book on trans health "the Gender Recognition Act 2004 (widely known among trans groups as the GRA) enabled trans people to change the name and gender on their birth certificate, on the condition that they intended this change to be permanent and could prove that they had been living 'full time' in their preferred gender for at least two years with some form of medical supervision." (5)

This community of people, that account for 1.4 millions individuals in the US only, have unique health risks that are not sufficiently addressed in western medicine. The number of people in this community is ever increasing as it is getting safer (in certain countries) to come out. However, it is worth noting the many forms of discrimination, prejudice or ignorance even when accessing general health services.

"It is not being transgender, per se, that increases the likelihood of self harm and suicide among trans kids but rather cultural and social prejudice that does the damage. This is true whether one is visible or not, but visibility does correlate to a higher level of suicide risk and lower quality of life."(6)

In a recent interview, Rae Swersey, a herbalist specialized in supporting transgender people, have declared (7) that transgender people are not seen as whole people, and their needs are not being met.

CURING vs CARING

The rapid and radical changes that can be obtained with the intake of synthetic hormones is unlikely to be mimicked with natural medicine. Nor has this ever been the aim of natural medicine given the difference in the approaches. However, inquiry into easing the transition is needed.

What appears to be needed is a shift about the way medical care deals with bodies in general and treats trans and queer bodies with complexity and respect.

To quote Rae Swersey: “you can never look at plant medicine like a substitute of allopathic medicine, it does different things than pharmaceutical hormones do.” (8) However, natural medicine can support a wide number of health issues given its broader holistic perspective.

The natural medicine approach foresees and is aware of the observations of many correlations that bring changes and transitions in someone’s body. Being able to monitor and recognize what organs and systems of thought are involved, is the first step in the application of this ancient and subtle discipline. In the case of supporting people whose transitions through life are more challenging, it seems the most coherent and understandable approach. As efficiently explained in the book *Hormones, Sex and Gender*, “Hormones do not directly cause specific biological or behavioural effects. Rather, hormonal action is mediated through an array of other factors. These include: circulating binding proteins, metabolic enzymes, cellular receptors, nuclear binding sites, competing molecules, and presence of cofactors. Additionally, each of these factors is modulated by concentration, binding properties (sensitivity, specificity, avidity), and enzyme activity. In other words, endocrine researchers have established that physiological effects of a hormone are not intrinsic but are “constructed” genetically and ontogenetically through these mediators of endocrine action.” (9)

In natural medicine the focus is in taking care of the person, not of the issue itself. The application of this broader perspective might prove useful in taking care of any health issue that anyone can have (and transgender people are no exception).

However, in the case of transgender people, given the higher possibility of discrimination or transphobia, the lack (or fear) of access to the medical care system or to hormones and hormone therapy (for social-political-economical reasons) etc., a holistic support seems to be the most appropriate.

The poignant observation made in the article “Is herbal transition a thing?”: “hormones can affect stress, but homophobia also really, really affects stress, which just isn’t something your doctors are going to work with you on”, is the perfect summary. (10)



ALLOPATHIC MEDICINE'S TAKE

Where hormone replacement therapies are available for transgender people, the prescriptions of medical doctors are predominantly “bioidentical” (chemically identical to those produced in the human body) hormones, nuanced in the doses according to the reaction of the subject. Up to now, there are no long term studies specific to the consequence of hormone usage within the transgender community. Most of the data comes from speculation, studies on non-transgender subjects or short term studies.

A clear outline of both types of hormone therapy (feminizing and masculinizing) is offered in the articles written by Madeline Deutsch and are available online. (11) In the case of feminizing hormone therapy, prescribed with the objective of stimulating the development of female secondary sex characteristics and suppressing male secondary sex characteristics, the use of estrogens and antiandrogens are generally combined. When it comes to estrogens, 17-beta estradiol is the most used. This hormone increases breast growth, softening of body hair, decreases body and facial hair and provokes a redistribution of fat.

Some of the reported side effects are migraines, mood swings, hot flashes and weight gain. (12) Amongst the most commonly used antiandrogens: spironolactone which has a diuretic effect and can cause hyperkalemia (high calcium level in the blood), cyproterone acetate (synthetic progestogen). This can cause fatigue, depression, weight gain, progestogens which have been reported as being responsible for breast and nipple development (but might cause depression, blood clots and cardiovascular diseases) and 5-alpha reductase inhibitors. In the case of the enzyme 5-alpha reductase, testosterone is converted within the human body into dihydrotestosterone which is responsible for the development of secondary sexual characteristics (body hair, lower tone of voice etc.). Inhibitors are finasteride and dutasteride. However, “these medications block neither the production nor action of testosterone, their antiandrogen effect is less than that encountered with full blockade. 5-alpha reductase inhibitors may be a good choice for those unable to tolerate, or with contraindications to the use of spironolactone. 5-alpha reductase inhibitors may also be an option for use as a single agent in patients seeking partial feminization, or for those who continue to exhibit virilized features or hair loss after complete androgen blockade or orchiectomy” (13)

Masculinizing hormone therapy is aimed to promote “the development of male secondary sex characteristics, and suppression/minimization of female secondary sex characteristics.” (14)

TESTOSTERONE

The main chemical preparation used in this case is testosterone. The effects might be lowering of voice tone, growth of facial hair, changes in facial and body fat distribution, change in body odor, male pattern baldness, increase in muscle mass, cessation of menses, and clitoral growth together with changes in libido patterns and emotional domain. Amongst the side effects there could be: alteration in hepatic functions (encountered with the use of synthetic testosterone in bodybuilding communities), ovarian or uterine cancer, osteoporosis, cardiovascular diseases, and acne.

Besides the debate on the excess of polarization over the concept of gender, the cultural imperative to be either/or, and the risks presented by the process of transitioning through chemicals, hormones replacement therapy has been an invaluable tool for transgender people around the world to finally harmonize social-identity and self-identity.

Additionally, the rate of suicide drops from 20 to 1% when some treatment is undertaken. (15) “Bodily modifications may also bring increased levels of safety and emotional ease as bodily appearance and gender identity meet to confer with normative assumptions around the gendered body [...] Body modification through the use of hormones and/or surgery, then, can bring security within a culture that is hostile to gender ambiguity.” (16)

NATURAL MEDICINE APPROACH

Throughout the study and analysis of the effects and, in particular, the side effects of the hormone therapies prescribed by medical doctors to transgender people willing to undergo a physical transition, it is possible to imagine and draw a general overview of how natural medicine might support or endorse the transition process.

As previously mentioned, there are numerous ways to express one’s gender and not all transgender people will choose hormone therapy or surgery as part of their path. As natural medicine practitioners, it is of uttermost importance to have a deep conversation with the person to identify their needs and expectations.



“Bodily modifications may also bring increased levels of safety and emotional ease as bodily appearance and gender identity meet to confer with normative assumptions around the gendered body [...] Body modification through the use of hormones and/or surgery, then, can bring security within a culture that is hostile to gender ambiguity.”

The most popular technique used to support transgender people in their transition has proven to be through herbs. It is nowadays possible to find quite a number of herbalists that have shifted their working approach in order to meet the sometimes unique needs of transgender clients. As Kara Siegler, a herbalist with significant experience in supporting transgender people states:

“PATIENTS REQUEST HORMONE THERAPY IN ORDER TO:

REAFFIRM THEIR INDIVIDUAL SENSE OF GENDER (GENDER IDENTITY),

DEVELOP PHYSICAL CHARACTERISTICS THAT ENABLE THE DEMONSTRATION OF THAT IDENTITY (GENDER EXPRESSION) TO THE WORLD AT LARGE. FOR EACH PATIENT, THE DECISION TO COME TO OUR TG CLINIC IS A MAJOR AND POSSIBLY LIFE-CHANGING EVENT.

MANY PATIENTS HAVE DONE RESEARCH ABOUT THE THERAPIES OR ALREADY KNOW OTHER TRANSGENDER PERSONS USING HORMONES.

MOST ARE DEFINITIVE IN THEIR DECISION AND HAVE THOUGHT ABOUT IT FOR YEARS. USUALLY, THEY ARE VERY SPECIFIC IN WHAT THEY WANT OR NEED FROM THERAPY.

DESIRE FOR A FULL TRANSITION, HOPING FOR MAXIMUM DOSES OF HORMONAL TREATMENT AS FAST AS POSSIBLE.

TO PROCEED SLOWLY IN ORDER TO HAVE MORE CONTROL OVER THE EFFECTS.

SOME MTF (MALE TO A FEMALE) WANT TO MAINTAIN ERECTIONS, WHILE OTHERS WANT TO ELIMINATE THEM.

TO EXPRESS AN ANDROGYNOUS OR GENDERQUEER IDENTITY;

TO DEVELOP A M OR F STRONG IDENTITY.

SOME PATIENTS HAVE ACCESS AND CHOOSE FROM DIFFERENT SURGICAL INTERVENTIONS.

SOME PATIENTS WANT SURGERY BUT DON'T HAVE ACCESS. SOME PATIENTS DON'T WANT SURGERY.

Exploring needs or desires helps medical providers to individualize treatment and identify the patient's perceptions of the possibilities and limitations of treatment. Patients often have unrealistic expectations; education about what to expect from treatment is imperative in the first visits.” (17)

Based on the empirical knowledge of herbalists and clients, thanks to the fact that much of this experience has been shared in publications and online, (18) and thanks to the helpfulness of two herbalists with specific knowledge on this topic that has agreed to be interviewed, Kiran Girivetto and Linden de Voil, the following section will provide an overview on the herbs that can be used to support transgender people.

HERBS

It will not come unexpectedly that there is almost no scientific research on the possible risks arising from combining herbs and synthetic hormones specifically in the transgender population. Most of the existing literature on the topic refers to cases of menopause or prostate issues.

Below are some of the herbs that were mentioned during the interviews that were conducted and will be mentioned in order to provide some examples. A wide variety of information is available online at the websites that we have already mentioned. It is important to understand that asking for support from a natural medicine practitioner includes the great value of empirical experience and a thorough knowledge of the procedures and best practices. Amongst the herbs traditionally used in prostate issues, adopted to support transgender people inhibit 5 alpha reductase. The best-known are: *Serenoa repens*, *Saw Palmetto* and *Urtica dioica*.

Amongst the many androgenic herbs (19) that might have a mild effect in increasing masculine characteristics, many have mentioned pine pollen (*Pinus sylvestrus*, *Pinus nigra*). It contains testosterone and androstenidione and it is suggested to be taken in a tincture. According to Rae Swarnsey, pine essence also serves to deal “with a sense of guilt or shame even when you have done nothing wrong and I think that in a society that tells trans people that us being who we are is somehow wrong, we internalize that.” (20) Another plant that might be used is *Tribulus terrestris* which seems to be increasing LH and testosterone production. (21)

When looking for estrogenic herbs, a couple that we can mention is *Pueraria mirifica* and *Actaea racemosa*. The first (sold generally for breast enlargement) contains chromenes that are estrogenic through stimulation of receptors, while the second aromatase inhibitors to estrogen and might have estrogenic activity. Many also report results using phytoestrogens (red clover, and soy). which are what is generally given to women during menopause.



WHEN IT COMES TO SUPPORTING THE BODY IN THE ATTEMPT OF MITIGATING THE NEGATIVE EFFECTS OF SYNTHETIC HORMONES, IT MIGHT BE USEFUL TO FOCUS ON SUPPORTING ORGANS OF ELIMINATION, OF METABOLISM AND METHYLATION (LIVER AND KIDNEYS) AND PREVENTING LONG TERM EFFECTS ON ORGAN SYSTEMS (CARDIOVASCULAR, LYMPHATIC) (22).

With this aim the following herbs might help for each respective area. It is always recommended to consult a professional herbalist.

Skin Support:
 Burdock (Aroctium lappa)
 Calendula (Calendula officinalis)
 Artichoke leaf (Cynara scolymus)
 Bentonite clay

For edema:
 Dandelion leaf (Taraxicum officinale)
 Nettle leaf (Urtica dioica)

Liver support:
 Curcuma
 Schisandra
 Silybum mariano
 Hypericum perforatum

Cardiovascular Support:
 Garlic (Allium sativum)
 Tulsi (Ocimum tenuiflorum)
 Turmeric (Curcuma longa)
 Guggul (Commiphora mukul)
 Crataegus

Hair Loss:
 Nettle root,
 saw palmetto (though these may interfere w/some T effects)
 Nettle seed
 Topical rosemary

Vaginal Dryness:
 Marshmallow root or leaf (Althaea officinalis)
 Slippery elm (Ulmus rubra)
 Flax (Linum usitatissimum)
 Dong quai (Angelica sinensis)
 White peony (Peonia lactiflora)

CONCLUSION

This paper has attempted to demonstrate that the holistic approach of natural medicine can work in a subtle way to encourage and stimulate the body to better support any individual. In the case of transgender people, given the sometimes challenging context that might exist natural medicine can be a support to avoid overstressing organs and the brain. As it has been shown, herbs and their natural chemicals can be an ally for transgender people throughout their life and transition, as the main focus is always to take care of the person, and not to cure their condition.

Nonetheless, this research could not cover the great amount of knowledge and useful information that other branches of natural medicine might offer to transgender people. It would be revolutionary and extremely useful if practitioners from the great variety of holistic techniques existing shared and made public their experiences in supporting transitions. This would encourage more scientific research on the topic and would help those people that feel that the only support in existence is synthetic hormones. Finally, the voices of transgender people that have found natural medicine helpful and supportive are needed to communicate and empathically share their experience. More scientific and empirical research is needed to uncover the benefits and type of support that natural medicine can offer to transgender people.

REFERENCES

- Capasso, Francesco, Grandolini, Giuliano, Izzo, Angelo, *Fitoterapia: Impiego razionale delle droghe vegetali*, ed Springer: 2012.
- Cook-Daniels Loree, "Trans Ageing", *Lesbian, Gay, Bisexual, and Transgender Ageing. Research and Clinical Perspectives*, Columbia University Press: 2006. 20-35. <https://www.jstor.org/stable/10.7312/kimm13618.5>
- De Voil, Linden, "Adverse Effects of Cross-sex Hormone Replacement Therapy", *Competent Care for Transgender, GenderQueer and Non-Binary Folks*. <https://drive.google.com/file/d/0ByUSLZG5H5B7ZkFOWWpObkRRVmc/view>
- Deutsch, Madeline B., "Overview of feminizing hormone therapy", Last modified 17 Jun. 2016. <https://transcare.ucsf.edu/guidelines/feminizing-hormone-therapy>
- "Overview of masculinizing hormone therapy", Last modified 17 Jun. 2016. <https://transcare.ucsf.edu/guidelines/masculinizing-therapy>
- Hanson, Katrina "Herbs for Transitioning: Feminizing Herbs" Last modified 24 Nov. 2014. <https://prismintegrativeacupuncture.com/2014/11/24/feminizing-herbs-for-mtf-transition/>.
- "Herbs for Transitioning: Masculinizing Herbs" Last modified 24 Nov. 2014. <https://prismacupuncture.com/2015/01/14/herbs-for-transitioning-masculinizing-herbs/>
- Hines, Sally, *Transgender practices of identity, intimacy and care*, Bristol University Press, Policy Press: 2007. <https://www.jstor.org/stable/j.ctt9qgpqw.7>
- Pearce, Ruth, *Understanding trans health. Discourse, power and possibility*, Bristol University Press: 2018. <https://www.jstor.org/stable/j.ctv1wxs4v.7>
- Sigler, Kara, "TransNatural for Professionals," *American Herbalists Guild* 2015. https://www.americanherbalistsguild.com/sites/default/files/kara_sigler_-_transnatural_0.pdf
- Travers, Ann, *The Trans Generation Book. How Trans Kids (and Their Parents) are Creating a Gender Revolution*, New York: NYU Press, 2018. <https://www.jstor.org/stable/j.ctvwr5cj.8>
- Wallace, Lewis "Natural Transition" *The Outline*, <https://theoutline.com/post/2494/can-herbal-hormone-therapy-help-the-transgender-community>. Last modified 21 Nov. 2017
- Worthman Carol M., "Hormones, Sex, and Gender", *Annual Review of Anthropology*, Vol. 24 (1995): 593-617. <https://www.jstor.org/stable/2155951>

WEBSITES

- <https://sites.google.com/vtherbcenter.org/transhealth/home>,
- https://en.wikipedia.org/wiki/Transgender_history
- <https://thegiamarioapproach.com/section/articles/>
- <https://cms.megaphone.fm/channel/globaldispatch?page=2&selected=OUT7148637777>



**TO THOSE WHO ARE GAY, LESBIAN, BISEXUAL, OR
TRANSGENDER-LET ME SAY- YOU ARE NOT
ALONE.**

**YOUR STRUGGLE FOR THE END TO VIOLENCE AND
DISCRIMINATION IS A SHARED STRUGGLE.**

**TODAY, I STAND WITH YOU. AND I CALL UPON
ALL COUNTRIES AND PEOPLE, TO STAND WITH
YOU TOO.**

**A HISTORIC SHIFT IS UNDERWAY. WE MUST
TACKLE THE VIOLENCE, DECRIMINALIZE
CONSENSUAL SAME SEX RELATIONSHIPS AND
END DISCRIMINATION. WE MUST EDUCATE THE
PUBLIC. I CALL ON THIS COUNCIL AND PEOPLE
OF CONSCIENCE TO MAKE THIS HAPPEN.**

THE TIME HAS COME.

BAN KI-MOON

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Start with Yourself.