

## **A Compendium of the Review and Research Projects and Articles Conducted by the Independent Global Medical Research Consortium (IGMRC) in 2022**

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### **Abstract**

The Independent Global Medical Research Consortium (IGMRC) comprising of a prolific core group of medical researchers who have collaborated for over five years. IGMRC's topics are contemporary and varied. The thirty-four articles published in 2022 spawned the concept of creating a compendium highlighting each published paper's distillation. In doing so, the authors hope to advance the specific research topics and facilitate the assimilation of material findings by the authors' many readers. Reader interest is evidenced by nearly 100,000 reads, spanning 196 peer-reviewed publications, on ResearchGate alone.

**Keywords:** *Alleviate Stress; Breathing Disorders; Antioxidant; Blunt Force Trauma; Cannabidiols; Cannabis; Chronic Pain; Cognition; Control Hyperglycemia; Cyanobacteria; Ecstasy; Healthy Gut Flora; Headache; Healthy Snacks; Holistic Therapy; Improve Metabolic Function; Ketones; LSD; Muscle Weakness; Natural Anti-Inflammatory; Nicotine Dependence; Phytonutrients; Psychotic Disorders; Tumor Suppression; Urinary Tract Infections; Warning Signs of Alzheimer's and Parkinson's*

### **Abbreviations**

AD: Alzheimer's Disease; ADHD: Attention-Deficit Hyperactive Disorder; AuNP: Gold Nanoparticle; AD: Alzheimer's Disease; BAT: Brown Adipose Tissue; BP: Blood Pressure; BSI: Bloodstream Infection; CT: Computed Tomography; CTTD: Closed Tube Thoracostomy Drain-

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age; DN: Dry Needling; ECS: Endocannabinoid System; ESBL: Extended-Spectrum  $\beta$ -lactamases; FFR: Frequency-Following Response; HD: Huntington’s Disease; IAI: Intra-Abdominal Infection; IMG: Integrative Medicine Group; KD: Ketogenic Diet; LTR: Local Twitch Response; MRI: Magnetic Resonance Imaging; MUA: Manipulation Under Anesthesia; PD: Parkinson’s Disease; PFMT: Pelvic Aloor Muscle Training; QoL: Quality of Life; ROM: Range of Motion; ROS: Reactive Oxygen Species; SC: Stem Cell; SFT: Solitary Fibrous Tumor; SFTP: Solitary Fibrous Tumor of the Pleura; SMA: Spinal Muscular Atrophy; SNS: Sympathetic Nervous System; TDD: Targeted Drug Delivery; TP: Trigger Point; UCP1: Uncoupling Protein 1; UI: Urinary Incontinence; UT: Upper Trapezius; UV: Ureterovesical Junction; UVJ-M: Mobility of the Ureterovesical Junction; VAD: Vertebral Artery Dissection; WAT: White Adipose Tissue

**Introduction**

Following are the summaries of articles published by the IGMRC in 2022. They are presented in chronological or from January 2022 to December 2022. There have been minor data updates, revisions, and grammar enhancements to the previous versions of the excerpted articles.

**Discussion**

**The application of psychoactive substances in psychiatric research**

Psychedelics are regarded as mind-revealing drugs. They are considered a group of substances that act on serotonergic receptors (serotonin5-HT) and, thus, are also known as serotonergic hallucinogens. The origin of these drugs or substances dates back to various ritual beliefs and cultural practices. Current research has explored and highlighted their therapeutic applications in specific psychiatric disorders like anxiety and depression. The article also sheds light on the ethical and legal framework in the current era of medical research regarding such substances.

Type/Category	Effect	Examples
Stimulants	Improvement in mood leads to excitement and a feeling of euphoria and alertness [12]	Nicotine, caffeine, cocaine, amphetamine
Depressants	Causing muscle relaxation and stress relief [13]	Alcohol, sleeping pills, tranquilizers, such as benzodiazepines
Opioids	Relief from pain symptoms, causing drowsiness and euphoria [14]	Pain medications, such as opioids (morphine, oxycodone) and heroin—also, also called street drugs
Hallucinogens	Rapid mood swings; experiences of altered reality (hallucination); and possible paranoia [15]	LSD, dextromethorphan, ketamine

**Table 1:** Classification of psychoactive substances

Historically, specific plants have been used to treat illnesses, disorders, and diseases. However, there remains a demand for more research on banned and widely consumed substances. There may be a fine line between understanding pharmacological properties and excess-dose amounts within the therapeutic paradigm. Specific mechanisms of action of substance combinations must be explored fur-

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ther to comprehend any beneficial or adverse interactions. Psychedelics are widely used by drug abusers and religious groups due to their hallucinogenic characteristics, which led to an interest in expanding the knowledge of these substances' poorly understood cognitive and psychological effects. Thus, serious and sincere dialogue is warranted among scientists, policymakers, federal agents, health care professionals, spiritual leaders, activists, and other key opinion leaders, regarding how psychedelics can aid human welfare and in supporting research investigating possible and potent novel substances [1].

### **Spirulina miscellany: Medicinal benefits and adverse effects of spirulina**

Spirulina's nutritional and health benefits have been known for thousands of years. Ancient cultures have grown and harvested Spirulina since written history and likely before. Much anecdotal evidence has been put forth, and more recently, evidence-based scientific research confirms many of Spirulina's nutritional and health benefits. However, such benefits are far-reaching (and only recently researched). In the commercial exuberance surrounding Spirulina, sparse research has been undertaken regarding potential toxicity or adverse effects. As a collection, this review highlights notable benefits, potential toxicity, and adverse effects in the human consumption of Spirulina. It is hoped that this review will provide the reader, especially those new to Spirulina, with an introduction and overview regarding the benefits and detriments of Spirulina, which will act as a springboard to more in-depth research regarding Spirulina as a vital nutritional and medicinal source for humans—needed now more than ever.

Based on its history as a food source and its favorable safety profile in animal studies, Spirulina is generally considered safe for human consumption—with rarely reported side effects. Nevertheless, additional clinical studies must establish a credible safety profile of Spirulina in humans. In addition, Spirulina products must have strict quality control measures to prevent contamination during growth and processing. Overall, data indicate that algae are a promising functional food supplement for human well-being and the prevention and treatment of various diseases. Spirulina supplementation can effectively control hyperglycemia and hypercholesterolemia, reducing CV risk in patients with type 2 diabetes. Also, Spirulina can help manage weight gain, facilitate the efficacy of anticancer agents, and serve as a potent antioxidant and anti-inflammatory agent to prevent specific diseases and improve human longevity [2].

### **The breath of life: breathing techniques as effective 'medicine'**

Breathing is a fundamental activity of all living organisms and is necessary for life. Although breathing is a priority, greater than 90% of living organisms use less than 50% of their breathing capacity efficiently. How a person breathes affects the functions of their entire body. Breathing exercises are regularly recommended to maintain mental peace, alleviate stress, improve psychophysiological function, and enhance organ performance. Yoga relieves stress, depression, anxiety, and acute or chronic mood disorders. Physical postures (asanas), breathing techniques (pranayamas), and meditation practices (dhyana) are the components of yoga that unite the mind, body, and spirit. Yogic breathing involves following a recommended breathing pattern and movements to positively affect immune function, regulate any imbalance in the autonomic nervous system, manage psychological and stress-related disorders and alleviate physiological processes, which help improve quality of life (QoL). If an individual is purposeful, these exercises are easy to learn, positively impacting life and behavior. Several experimental and computational studies support the benefits of controlled breathing methods on overall well-being. Each type of yoga provides unique physiological and psychological advantages attributed to posture, the use of mouth and nostrils, frequency and duration of breathing, laryngeal muscle contraction, glottis position, and tidal capacity. Practicing yoga is generally considered safe, although special populations—such as older individuals and those with high-risk diseases—require appropriate consultation before undergoing such practices. This review provides an overview of breathing-related practices, such as breathing as a non-pharmacological intervention to manage and overcome stress and other breathing disorders.

The application of breathing practice is a practical, non-interventional exercise to regain proper, healthy breathing. Disease states can disrupt normal, healthy breathing. Breathing exercises are beneficial in various medical conditions, physical and psychological. As the



**Figure 1:** Various types of breathing techniques currently used for their beneficial effects

American Lung Association has pointed out, most people breathe improperly, and there are optimal breathing practices—diaphragmatic (belly) breathing and pursed-lip breathing. In addition to the ALA's best breathing practices, various breathing techniques have been employed throughout history and to the current day: Qigong, Pranayama, Kapalabhati, Bastrika, Nadishodhana/Nadishuddhi, Suryanuloma Viloma, Chandranuloma Viloma, Suryabhedana, Ujjayi, and Bhramari, among others. Nevertheless, caution is needed in specific breathing exercises. Overbreathing can lead to adverse effects, such as respiratory alkalosis, hypoxia, cramps, paresthesia in the distal upper and lower extremities, and panic attacks [3].

### The role of the gut microbiome and dysbiosis in common psychological, neurological, and behavioral disorders

According to psychobiotic research expansion, the gut microbiome—a colony of more than 1000 species—is connected to brain health and state of mind. Historically, even though a variety of body parts and systems were linked to the nervous system in the nineteenth century, researchers began investigating the gut, especially the stomach, calling it 'the great abdominal brain', 'the great nervous center', and 'the great sensory center'. In addition to the neurons of the enteric nervous system, the gut and brain are connected by the microbiome, which influences the brain by varying mechanisms and contributes to the behavioral state of the individual. A healthy gut flora greatly benefits the host. Dysbiosis or dysbacteriosis occurs when the undesirable bacteria outnumber the desirable bacteria contributed by diet, medications, and stress. Dysbiosis has been linked to several brain disorders, such as autism, schizophrenia, depression, anxiety, attention-deficit hyperactive disorder (ADHD), bipolar disorders, sleep disorders, eating disorders, substance abuse disorders, HIV infection, and neurological disorders (Alzheimer's disease and Parkinson's disease). Gut bacteria interact with the brain in various ways, including neuroendocrine, immunological, and metabolic pathways. This review discusses how dysbiosis affects brain-related disorders. This review also describes the pathogenic microbes that predominate the gut microbiota over other health-giving microbes and the mechanism underlying the pathogenesis of brain disorders arising from dysbiosis.

The gut-brain axis links the central and enteric nervous systems. The gut microbiota influences the interactions between the intestines (gut microbiota) and the psychological (emotional) brain centers. It signals the brain, and the brain sends signals to the gut microbiota via neural, endocrine, immune, and humoral links. Current research suggests that gut dysbiosis may underlie specific psychological conditions, disorders, diseases, and behaviors. Thus, future research should investigate these potential and profound connections to cure, prevent, or ameliorate such conditions, illnesses, and diseases [4].

**The numerous and varied applications of Spirulina in medical practice**

Spirulina is a cyanobacterium (blue-green alga) rich in vital nutrients, having tremendous potential as a “future food”. The utility of algae is not limited to providing nutrition. Specific alga can perform the following functions: immunomodulator, anti-allergic, cleanses the body of toxins, antitumor, anti-inflammatory, antiviral, and abstergent (cleansing the body of toxins). Spirulina has been a vital dietary component for humans for millennia. The United Nations recognizes Spirulina as a potential defense against malnutrition. The current evidence in support of Spirulina points towards performing further research regarding the promising applications of Spirulina. These organisms are a rich source of bioactive compounds and, thus, should be considered as an alternative and supplementary therapy—albeit with scientific support and evidence-based studies. The revolution in functional foods continues as the incidence of lifestyle-related diseases increases. The most notable experiments have been conducted studying Spirulina’s effect on metabolic disorders, revealing its ability to reduce cholesterol, triglycerides, and blood glucose. Also, Spirulina has particular applications in cancer research, protecting against the adverse effects of specific chemotherapeutic agents. Microalgae can also form special supplements for vegetarians, offsetting the absence of protein in the vegan diet. Nevertheless, Spirulina also has a negative side and potential adverse effects. Self-medication with Spirulina supplements can lead to unwanted complications if a person takes immunosuppressants or anticoagulants concomitantly or suffers from autoimmune diseases. Children and pregnant women should avoid these products until more applicable data are obtained. Also, some people may have an inherent allergy to algal products.

Health benefit	Relevant mechanisms of action
Anti-inflammatory [41]	Chromophore phycocyanobilin exhibits anti-inflammatory and antioxidant properties. It activates antioxidant enzymes, inhibits lipid peroxidation and DNA damage, and destroys free radicals.
Fights fatigue [4]	Specific constituents of Spirulina, such as polysaccharides (rhamnose and glycogen) and essential fat, are absorbed by cells and help in energy release. It helps form vitamin B6 by increasing Lactobacillus in the intestine, which also helps in energy release.
Anti-allergic [42]	Spirulina inhibits histamine release, reduces IL-4, and heightens IgA production. It also regulates T-helper cells in people with allergic rhinitis.
Antiviral [43]	The sulfated polysaccharide—calcium spirulan (Ca-Sp)—displays antiviral properties, inhibiting <i>in vitro</i> replication of specific viruses, such as Herpes simplex type I, human cytomegalovirus, measles and mumps viruses, influenza A virus, and human immunodeficiency virus-1.
Lipid and cholesterol [25]	Spirulina lowers high-density lipoproteins and triglycerides while increasing low-density lipoproteins and decreasing triglycerides.
Antioxidant [44]	C-phycocyanin exerts antioxidant and free radical-scavenging properties. It induces apoptosis in RAW 264.7 macrophages stimulated by lipopolysaccharides. Other constituents, such as tocopherols and beta-carotene, deactivate the free radicals generated in body phycocyanins.
Antimicrobial [23]	Spirulina stimulates antimicrobial activity as shown by functional lipids (c-linolenic acid) and an antibiologically active fatty acid. Lipids destroy microorganisms by disintegrating cellular membranes.
Obesity/weight loss [17]	Spirulina reduces macrophage infiltration into visceral fat, prevents hepatic fat accumulation, reduces oxidative stress, improves insulin sensitivity, and satiety.
Anemia [18]	C-phycocyanin encourages hematopoiesis and erythropoietin. Its essential amino acids, folic acids, vitamin B12, and iron also prompt erythropoiesis.
Hepatoprotective [45]	In NAFLD, AST decreases, and ALT levels increases.
Increases exercise-induced health benefits [46]	Spirulina neutralizes reactive oxygen species formed during high-intensity exercises, increases aerobic exercise performance, decreases carbohydrate oxidation, increases fat oxidation, and lowers lipid peroxidation.

*Table 2: Various health benefits of Spirulina and relevant mechanisms of action*

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Due to ongoing research that has reported encouraging findings, Spirulina as a food supplement has gained immense popularity. Various companies manufacture and sell algae-based products and distribute them globally. Spirulina, in multiple forms, has become a part of the human diet and nutrition. However, the functional food industry needs to focus on the safety and efficacy of these products, which can only be possible through robust scientific experiments. The effect of Spirulina on the food industry and its impact on human health should be presented in a more unified manner. Many animal-based studies have shown the benefits that must be corroborated by conducting human trials. Scientific, evidence-based validation is of utmost importance. Notably, specific side effects of Spirulina and possible drug interactions are severe and should not be overlooked [5].

**The biochemical factors and mechanisms of human emotions and the biochemistry of belief**

Emotion is a fundamental aspect of behavioral, social-psychological, and neurobiological sciences, encompassing a range of experiences adapted subjectively by humans. Emotion forms the center of everyday human experiences. Behavior, physiological arousal, cognitive appraisal, motor expression, and subjective experiences are critical components in studying emotions or feelings. Beliefs integrate external and personal reflections on their behavior. Relational views are developed instantaneously by associating with those of the same or similar ideologies. In contrast, language forms the basis of conceptualizing more complex beliefs based on extensive participation in ritual acts and narratives. Awareness and consciousness are stimuli of human biochemistry. Beliefs help in decision-making and pave the way for moral judgment. Beliefs influence factors directly or indirectly involved in psychopathology. Feelings also evaluate an individual’s beliefs and express the power of self-reliance. This paper describes the neural network of emotions, feelings, beliefs, and perceptions, which appear diverse.

<b>Hormones</b>	<b>Role in cognitive functions, emotions, and mood patterns</b>
Acetylcholine	Increases learning ability
Dopamine	Supports decision-making, explores novelty, and coordinates movements. It also stimulates pleasure sensations and desires—labeled the ‘happy hormone’
Adrenaline	Provides the extra energy required by the body to cope with critical or urgent situations, and dangerous or extraordinary circumstances
Noradrenaline	Helps in memorizing long-term projects
Serotonin	Provides relief and calmness, and helps maintain and attain patience by limiting the perception of frustration and aggression
Cortisol	Acts similarly to adrenaline, being released in stressful scenarios
Oxytocin	Factorial in social interactions by encouraging trust, positive feelings, empathy, and generosity. Labeled the ‘love hormone’ as it plays a vital role in mother-child relationships, lactation, and familiarity

**Table 3:** Hormones and their role in cognitive functions, emotions, and mood patterns

Emotional episodes are transient, critical to survival, and strongly influence various cognitive processes, such as attention, perception, decision-making, and memory. Every emotion triggers a vast hormonal network of secretions. Religious belief is a unique human experience (trait), considering a supernatural agent or relating to cosmological constructs, such as ‘heaven’ and ‘hell’. Inherent computations in the neural network are the driving force for the phylogenetic expansion of the human brain. Cognition and feeling are separated, based on experience, and influenced by the emotional state of feelings that may not be truly justified. Nevertheless, emotions can sway humans to fashion a supporting rationale. Neurotransmitters are the ‘code’ that the brain uses to communicate and exchange continuous information. However, beliefs and their dramatic influence on feelings and emotions remain a medical mystery, yet to be decoded. Understanding better the biochemical factors and mechanisms of human emotions and the biochemistry of belief will have an inestimable impact on enhancing positive human interactions and social stability and treating those patients hampered by aberrant beliefs and behavior [6].

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### Sound therapy: vibratory frequencies of cells in health and disease states

Sound therapy is a revolutionary medical treatment and prevention approach, transforming the current treatment landscape. The therapy is based on the notion of resonance. In homeostasis, electromagnetic fields—surrounding the body and all organs, cells, bones, tissues, and liquids—have a healthy vibratory frequency. Sound wave treatment induces profound relaxation, which facilitates the healing of emotional anguish and scars. Sound therapy helps a person release fear and sadness, improves feelings of loneliness and despair, “cleanses” harmful emotions, and provides constructive insights regarding emotional conflicts. It also helps alleviate physical disorders, such as aches and pains, muscle and connective tissue difficulties, mobility issues, postoperative rehabilitation, and tinnitus. Also, it can be used as adjunctive therapy with standard cancer treatments. This review article discusses the importance of sound therapy and the pioneers’ use of sound strategies to heal. The review also highlights the frequencies generated by different body organs and how to detect diseases based on changes in these frequencies. Furthermore, tools used to administer healthy frequencies to diseased cells and the future of sound therapy are offered and explained.



Figure 2: Benefits of sound therapy

Sound healing is a holistic therapeutic approach, using precise frequencies, vibrations, and musical melodies and refrains to restore the body’s energy system, supporting healing and recovery processes. Sound application has been a primary component of healing methods throughout ages and continents. In addition, several studies on sound and music, health care, and technology have been conducted to improve collaboration among the healthcare, medicine, music, and technology fields. Due to the data researched and presented herein, it is posited that applying sound, music, and vibration therapy with standard medical treatment will contribute to humanity’s well-being, health, and spiritual growth [7].

### Pragmatic approaches and clinical rationale in addressing postpartum stress urinary incontinence (UI) in women

Postpartum urinary incontinence (UI) is a common and significant concern, affecting approximately 30% of women within the first three months of delivery. Multiple variables, such as unique genitourinary structure, pregnancy, number and type of delivery, menopause, constipation, hypertension, diabetes, and body mass index (BMI), aggravate risk factors. Aging causes the pelvic floor muscles to weaken, reducing structural support to pelvic organs, and leading to UI. Urinary tract infection, occupation, level of physical activity, and work-

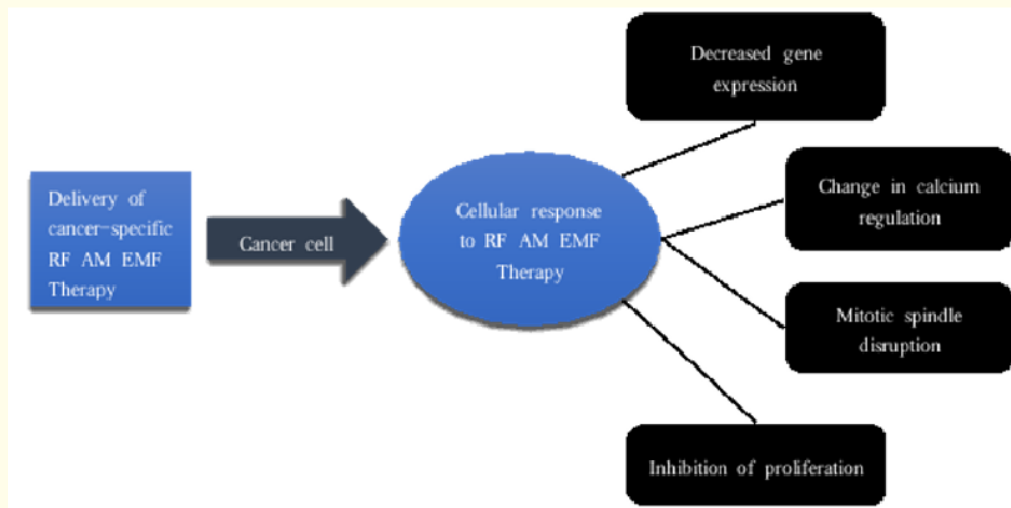


Figure 3: Cancer-specific treatment and responses

ing status contribute to postpartum stress UI in women. Stress UI is the most commonly reported form of UI, with a prevalence of 54%. The incidence rate (31%) is similar in primiparae and multiparae women. Currently, many women prefer to deliver through a Cesarean section (C-section). The likelihood of developing stress UI increases in women giving birth vaginally compared to those opting for a C-section. UI is undiagnosed and untreated in nearly 50% of the affected patients, leading to secondary complications and increased disease burden. Women's health care providers should offer pregnant women adequate information and necessary audio-visual materials regarding UI. Pregnant women in the last trimester and those at risk of developing postpartum stress UI within 6 months of delivery must be provided sources discussing the benefits of pelvic floor muscle training (PFMT). This review provides an overview of the current practices to manage stress UI and highlights practical approaches to treat and prevent postpartum stress UI with pharmacological and non-pharmacological interventions.

Women's health practitioners should provide their patients with adequate information, audio-visual materials, and sources to further clarify postpartum care. Patients must be appraised of the advantages of PFMT during and after pregnancy and the methods to perform PFMT. An intervention combining PFMT and an app (application program) can help overcome information barriers and promote preventive, curative, and maintenance benefits of PFMT in women during the last trimester and those experiencing stress UI within 6 months to one year after delivery. The severity of stress UI can be objectively assessed by determining the mobility of the ureterovesical junction (UVJ-M), rotation angle, and distance from the bladder neck to the lower edge of the pubic bone. A reference standard of UVJ-M > 1 cm can be used as an objective indicator for the ultrasound-guided diagnosis of stress UI. Also, ultrasonography helps identify mutual associations between the various structures of the pelvic floor, reflecting the morphological and functional status. The predicted threshold values in UVJ-M in women at 34, 36, and 38 gestational weeks and 6 weeks after delivery demonstrated that the prevalence of stress UI ( $\chi^2 = 5.624$ ,  $P = 0.016$ ) was significantly increased. UVJ-M was also raised during these gestational weeks. Further validation in the postpartum setting can effectively detect the presence of postpartum stress UI based on changes in abdominal pressure. Most studies indicated that vaginal delivery is a significant risk factor for postpartum stress urinary incontinence [8].



### Gait: the first indicator of many neurological diseases and disorders

The intricate interplay of the primary elements of the neurological, musculoskeletal, and cardiorespiratory systems underpins human gait. In elderly individuals, a preferred brisk walk strongly indicates overall health and quality of life (QoL). However, the physiology of walking is complicated. Thus, diagnosing gait problems requires a thorough understanding of normal gait physiology. Gait abnormalities are typically a debilitating side effect of aging. Irrespective of whether neurological or non-neurological in origin, they are a significant source of disability, morbidity, and mortality in the elderly population. Gait abnormalities result in the loss of personal freedom, falls, and injuries, significantly decreasing an individual’s QoL. This review discusses the origins and concepts of instrumented gait analysis. A method for examining gait and essential aspects of prevalent gait abnormalities and their underlying causes are also covered. In addition, a clinically focused strategy for treating neurological gait concerns in elderly individuals and the future of gait analysis is presented.

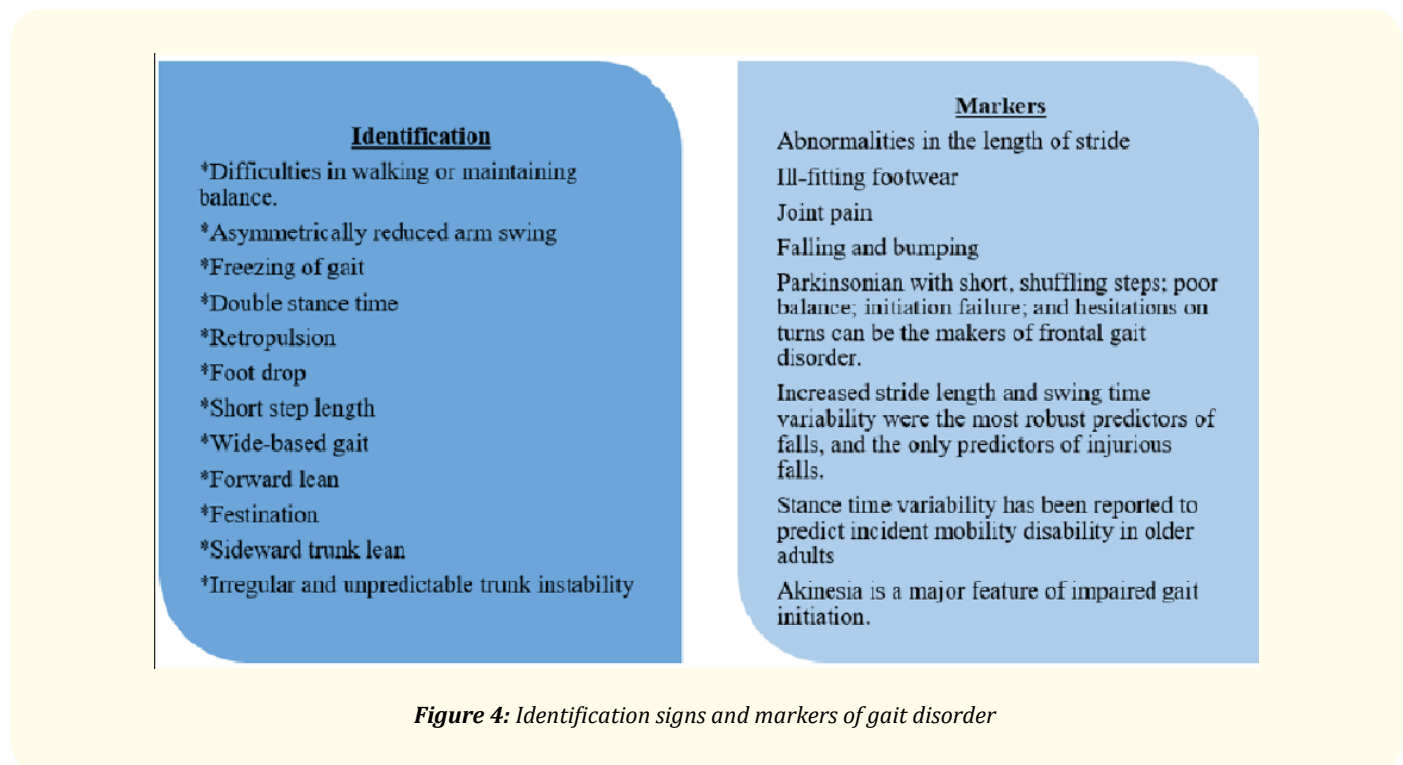
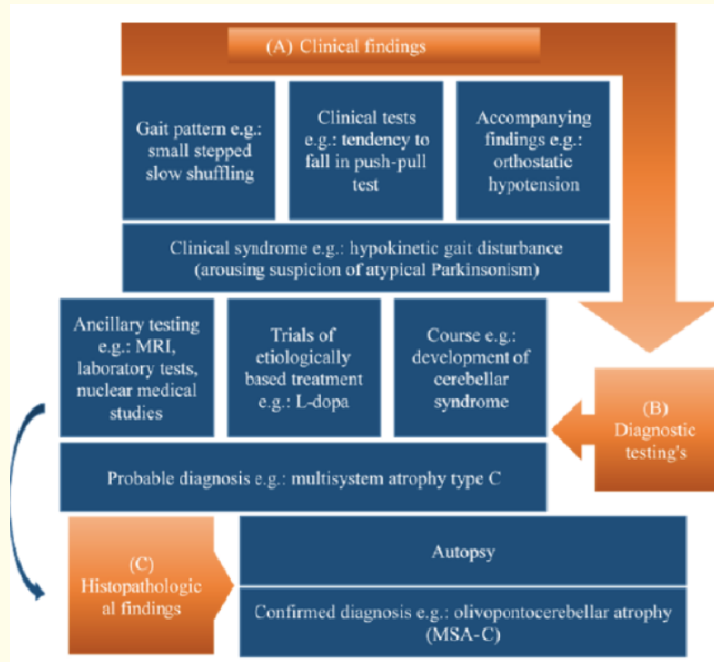


Figure 4: Identification signs and markers of gait disorder

This article aimed to review studies regarding the associations between neuropathology and gait abnormalities. Moreover, gait can be used to potentially identify—early on—some of the most severe neurological conditions, such as AD, PD, and HD. Patients with these neurological conditions often have extremely unusual gaits, which motivates researchers and clinicians to target a patient’s gait for possible identification. Importantly, gait abnormalities are not an unavoidable result of aging; they can indicate underlying conditions requiring particular diagnostic procedures. Wearable technology and machine learning approaches are currently being applied in gait analyses. Continuing and novel research will strengthen the fundamental knowledge of gait disorders, opening new possibilities for better managing this prevalent and debilitating condition [9].



**Figure 5:** Diagnostic method for categorization of gait disturbances. Key: A: Initially, classification is based on the clinical description of gait abnormalities. B: A probable diagnosis is formed based on the findings of ancillary tests and the patient's subsequent course. C: Only an autopsy can provide a definitive diagnosis.

### Clinical research report of the intricate application of dry needling in eliciting trigger points local twitch response (TP-LTR) in the upper trapezius (UT) region

**Background:** No past studies have examined the local twitch response (LTR) in the upper trapezius (UT) using multiple needles with manipulation. Prior and published research studies have focused primarily on a single-needle approach.

**Purpose:** This study was designed and performed to collect data on the LTR and its relationship to the number of (acupuncture or dry needling) needles that create biotensegrity tension in neuro-myofascial dynamics (to bring about relief from UT tension and related symptoms).

**Methods:** Data were gathered from qualified clinic patients and volunteers from a study population. All selected study participants were experiencing increased upper trapezius (UT) tension and pain or discomfort in the UT region. Certified practitioners located possible trigger points (TPs) by palpation. Treatment procedures—utilizing Ashi points—were applied. The following data were evaluated to determine the most productive number and size of needles in effecting biotensegrity tension in neuro-myofascial dynamics and the subjects' release or relief from UT tension.

**Results:** The results were analyzed using statistical bar graphs (tables) based primarily on pre-treatment and post-treatment interviews and questionnaires. The primary data utilized determined the following. The average number of needles used was 3.15 for the right side

and 2.73 for the left side. The average thrusts were 18 for the right side and 12.9 for the left side. The average number of 90-degree twists was 0.5 for the right and 0.8 for the left sides. The average number of 180-degree twists was 18.4 for the right side and 12.05 for the left side. The average duration of relief was 5.475 days, and the average period of soreness was 16.2 hours.

**Conclusion:** Specific results of this study depicted a 3-D neuro-myofascial dynamics matrix using multiple needles, thrusts and twists, and LTR locations. These results demonstrated that overall and on average, multiple needling with larger gauge needles (based on participants’ tolerances) was more effective in reducing UT tension and associated symptoms (and longer-lasting relief) than the more conventional and utilized one-needle protocol [10].

**A desktop primer and practical review of cannabis-containing compounds and their entourage effects**

Cannabis sativa is one of the first domesticated plants known to humankind for its varied psychological, physical, and emotional benefits. Its first use was reported in 2600 BCE in Chinese Pharmacopoeias. Cannabis subspecies hemp and marijuana are widely studied extracts. It is a complex plant with specific constituents acting synergistically. The discovery of the plant’s numerous compounds led to another discovery—that of the endocannabinoid system (ECS), which is widely distributed in the human brain and body. The ECS is responsible for various physiological and psychological effects. However, an increase in epidemiological studies is associated with dose-increasing psychotic disorders, raising significant concern among researchers and physicians. Research began on hundreds of cannabinoids contained in the cannabis plant, leading to the detection of CB1 and CB2 receptors—following the characterization of the ECS in the human body. Specific chemicals express synergistic effects, known mainly as “entourage effects”. The concerted impact of the chemical constituents of cannabis enhance the overall pharmacological properties of the plant. Various studies have supported this entourage effect. However, a few studies debunk the construct of cannabis’ entourage effects. Recent changes in the US FDA Legalization and Scheduled Drug Act are facilitating research on the cannabis plant and compounds to explore the therapeutic potential.

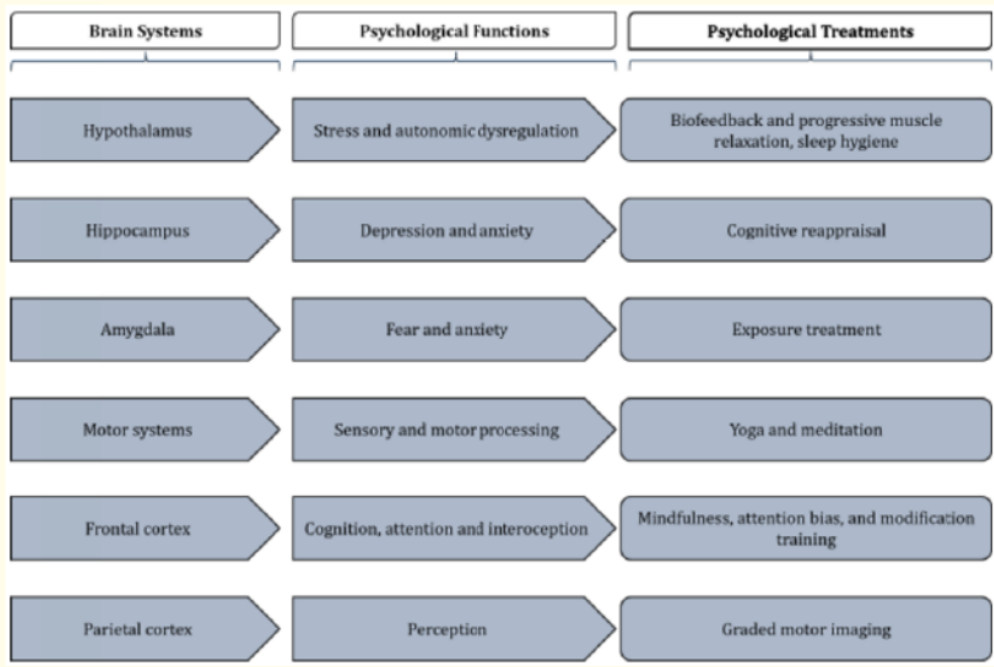
Name	Effects
Cannabidiol (CBD)	Used to treat psychotic disorders and used as an analgesic, anxiolytic, anti-inflammatory, anticonvulsant
Tetrahydrocannabinol (THC)	Euphoric, analgesic, anti-inflammatory, anticonvulsant
Cannabinol (CBN)	Anti-inflammatory, anticonvulsant, antibiotic, sedative
Cannabigerol (CBG)	Antifungal, anti-inflammatory, analgesic
Cannabichromene (CBC)	Antifungal, anti-inflammatory, analgesic
Flavonoids	Antioxidative, anti-inflammatory
Terpenes (Terpenoids)	Aroma

**Table 4:** Functions of various cannabinoids

Over the years, public and research interests have continually expanded regarding the potential health benefits of various extracts and strains of the cannabis plant. There are arguments in favor, based on anecdotal evidence; however, the science in support of the chemical constituents of the cannabis plant is limited. Moreover, many scientists consider the entourage effect wishful thinking. Understanding the medicinal chemistry of hundreds of cannabis compounds is essential to determine via clinical trials. Individual randomized controlled trials are necessary to identify various constituents and their relationship to patient characteristics and any underlying medical disease. Future studies will also help weigh the potential benefits against any risks, especially concerning side effects, short-term or long-term [11].

### Neuronal mechanisms and treatment approaches to emotional and physical pain

The feeling of pain encompasses a range of mental and physical states, sharing the scale of mild annoyance to debilitation. Pain is the most common symptom reported to healthcare professionals—psychological pain results from negative emotions induced by any feeling of loss. Physical pain is an aversive state that originates from an injury or disease. Pain is a complex and bio-psycho-social phenomenon arising from interactions of anatomical and chemical systems of neural networks and involving several cognitive processes. Medicine still regards pain as a symptom of physical injury, despite evidence of many people suffering from psychological-based pain. The concept of pain requires broadening and inclusion to accommodate the basic science of pain originating from various sources, that is, physical and psychological. Research on emotional psychology and pain has increased in many aspects with overlapping and non-linear networks. Psychology could be an essential contributor to understanding and depicting chronic pain treatment approaches, as psychological illness and pain are viewed as a reciprocal relationship that involves the expression of the disease and the pain that showcases specific effects on the behavior and emotional state. Persistent pain is complex, with emotions only scaling as a contributing factor supported by anecdotal evidence with frequent association. Other factors, such as genetic, environmental, contingencies, placebo, and cognition, also play an essential role in studying the aspect. This review provides an overview of chronic and emotional pain and its underlying neuronal mechanisms and treatment approaches.



**Figure 6:** Brain system network altering the psychological functions in chronic pain

Pain is rarely concentrated from a psychological point of view, while the relationship and indivisible nature between physical and psychological (emotional) suffering is the epitome of pain. However, the relationship between pain and psychology is intricate and reciprocal, and it has supporting evidence from clinical data of overlapping presentations between anatomical structures [12]. The multidimensional network of pain has regained the strength to explore psychophysiological phenomena. Common and divergent aspects of physical and

psychological pain provide a framework for analyzing more RCTs, followed by real-world evidence studies to support the data. Wager (2013) has presented additional evidence suggesting a significant degree of specificity in the underlying neural mechanisms directly associated with physical pain and the processing of social pain [13]. The neuro signature pattern is a characteristic generated by a widely distributed neural network in the brain and proposes pain as a multidimensional experience. Physical and psychological distress are now understood to be controlled and regulated by similar and overlapping neural network mechanisms, which require more data to support. The neuromatrix components of both networks that encompass behavioral output have yet to be identified [14].

Further examinations of different forms of pain will undoubtedly support the knowledge of the psychological and biological mechanisms that contribute to the onset and maintenance pathways of the phenomena. Considering the brain as an orchestra and aiming to correlate the components to harmonize the tuning will facilitate focusing on the theoretical issues of brain functioning and learning and the evolutionary aspect. This understanding will help design future studies on depression, chronic pain, addiction, and anxiety disorders [15].

### **The beneficial effects of honey on the human heart, cardiovascular system, and non-cardio conditions**

Honey is produced worldwide and contains small amounts of sugars, enzymes, amino acids, minerals, trace elements, vitamins, scent molecules, and polyphenols. All generations and civilizations, ancient and modern, recognize it as food and medicine. Honey has been consumed in various ways, including as a sugar substitute and flavoring ingredient. Carbohydrates, such as monosaccharides, fructose, and glucose, are the essential elements in honey. Honey has a plethora of additional compounds at minuscule levels that have antiviral, anti-parasitic, anticancer, anti-inflammatory, antimutagenic, antioxidant, immunosuppressive, and antibacterial properties. It can also be used as an antidiabetic and weight management supplement. Alongside its therapeutic properties, it also functions as a prebiotic, promoting the development of probiotic bacteria. Honey's importance has been recognized in scientific papers, and compelling evidence supports its therapeutic use. This review aims to present the history of honey and investigate its role in medicine and cosmetics.

Honey's color, sensation, and content vary depending on the botanical origin. It is made up mainly of monosaccharides. Honey is a high-nutrient food with antioxidant, anti-inflammatory, and antimicrobial effects, with cough relieving and wound healing abilities, used alone or in conjunction with other compounds to cure various diseases. It also has the unique and invaluable feature of enhancing the properties and activities of the medicinal drugs with which it is combined [16].

### **Revisiting an old friend: the gastrointestinal benefits of regular popcorn consumption**

Corn is the third most commonly consumed cereal grain worldwide. It is used to prepare a variety of traditional and modern human meals. Popcorn is a form of flint corn that pops when heated. It has been enjoyed for millennia and is among the most popular snacks globally. Popcorn is rich in phytonutrients, minerals, and vitamins. Also, it is considered tasty, delicious, and a great source of fiber. Popcorn's health benefits include essential nutrients (complex carbohydrates, vitamins, and minerals) and distinctive phytoconstituents (polyphenolic compounds). The nutritional benefits of popcorn were highlighted in the 1980s, ensuring its continued use. Popcorn intake is associated with a lower risk of chronic illnesses like cardiovascular disease, type 2 diabetes, obesity, several malignancies, and improved gastrointestinal system health. This paper is a comprehensive review of the history of popcorn, from its first reported consumption to the present, and its health benefits, focusing on its gastrointestinal health.

Corn consumption dates to the fourteenth century. Popcorn has attracted attention for its high content of minerals, bioactive compounds, and phytochemicals, as well as possible health benefits discovered in recent decades. Popcorn is a popular food high in nutrients and functional characteristics. As a result, it has grown in popularity over time. It is a healthy grain snack packed with essential minerals and high-fiber content. Thus, popcorn can be recommended as part of a regular diet [17].

### Local twitch response (LTR) as an indicator of trigger point (TP) needling therapy success regarding upper trapezius (UT) muscle spasms, and TP's efficacy compared to diverse modalities in addressing UT muscle spasm

This systematized review sought to qualify better and quantify the causal relationship between trigger-point (TP) needling efficacy and the local twitch response (LTR) regarding the upper trapezius muscle. A systematized review is defined by the Duke University Medical Center Library and Archives as an attempt to include elements of the systematic review process while stopping short of a conventional systematic review. The limited data utilized showed, preliminarily, that an LTR from needle insertion is a relative indicator of treatment success—as determined using a Visual Analogue Scale and measuring the patients' ranges of motion, pre-treatment and post-treatment. This review also noted that an LTR is a probable prerequisite for identifying effective TPs and a helpful hallmark in treating patients, resulting in peak benefit. However, this procedure can cause post-treatment, needling application-area tenderness. Novel research should consider the number of LTRs resulting in dry needling (DN) maximal benefit at a specific TP. Finally, it is noted that utilizing 0.12 mm needles inhibits muscle soreness, mitigates patient anxiety concerning needling, and enhances needling therapy efficacy—as indicated in the comparison studies.

Although DN provoked LTRs in only 16% of the reviewed studies, the LTR-provoked group experienced significant pain reduction and increased ROM. Thus, preliminarily, it can be posited that a DN-induced LTR will indicate—to the physician, therapist, and patient—that pain will likely gradually diminish. Movements may become less restricted, positively affecting the patient's quality of life (QoL). LTR is vital in recognizing TPs and helpful in treating patients, resulting in maximum benefit. However, this procedure can cause post-treatment and application-area tenderness. Future research should investigate the number of LTRs resulting in a maximal advantage of dry needling at a specific trigger point. As a valuable and pertinent footnote to this systematized review, eliciting an LTR with 0.12 mm needles typically reduces post-treatment muscle soreness and pre-treatment patient anxiety from needling. Also, this needle gauge enhances needling therapy efficacy, as noted in comparison studies [18].

### Solitary fibrous tumor of the pleura (SFTP): a rare form of an intrathoracic space-occupying lesion

**Introduction:** This paper reports on an elderly African female who presented with a right intrathoracic space-occupying lesion, which was subsequently discovered to be a giant benign solitary fibrous tumor of the pleura—with a discussion of the surgical intervention that followed.

**Case report:** Presented is the case of a 75-year-old female who was referred to the Cardiovascular and Thoracic Surgery Unit, Federal Medical Center, Umuahia, Nigeria, with complaints of vague chest discomfort and progressive shortness of breath over 18 months. The imaging investigations were reviewed, indicating the need for a right posterolateral thoracotomy for tumor resection. The surgical procedure lasted approximately 2 hours, followed by an uneventful postoperative recovery. After one week, the patient was discharged, is currently asymptomatic, and is being seen on an outpatient basis. Discussion: Pleural SFTs are rare neoplasms, most benign. Pleural SFTs present with various and distinct symptoms. Chest CT scanning is the preferred imaging technique. Nevertheless, the radiological differentiation between the benign and malignant variants remains challenging. Surgery is the treatment of choice for a solitary fibrous tumor of the pleura (SFTP). Local recurrence can present in malignant cases but is infrequent in solitary benign tumors. Surgical resection's prognosis is generally favorable, even for a malignant SFTP.

**Conclusion:** Rapid preoperative diagnosis followed by expeditious surgical intervention is the goal in surgical resectioning a solitary fibrous tumor (SFT), resulting in rapid symptomatic relief and long-term survival in benign and most malignant SFTs. SFTs are rare tumors, challenging to diagnose definitively.

Solitary fibrous tumors are rare tumors that can pose a diagnostic dilemma. Hence the need to maintain a high level of suspicion when evaluating a patient with an intrathoracic mass. Surgical resection is typically rewarded with rapid symptomatic relief, confirmation of the

pathological diagnosis, and long-term survival in benign and most malignant SFTs. A rapid preoperative diagnosis followed by expeditious surgical intervention is the objective when treating a solitary fibrous tumor of the pleura [19].

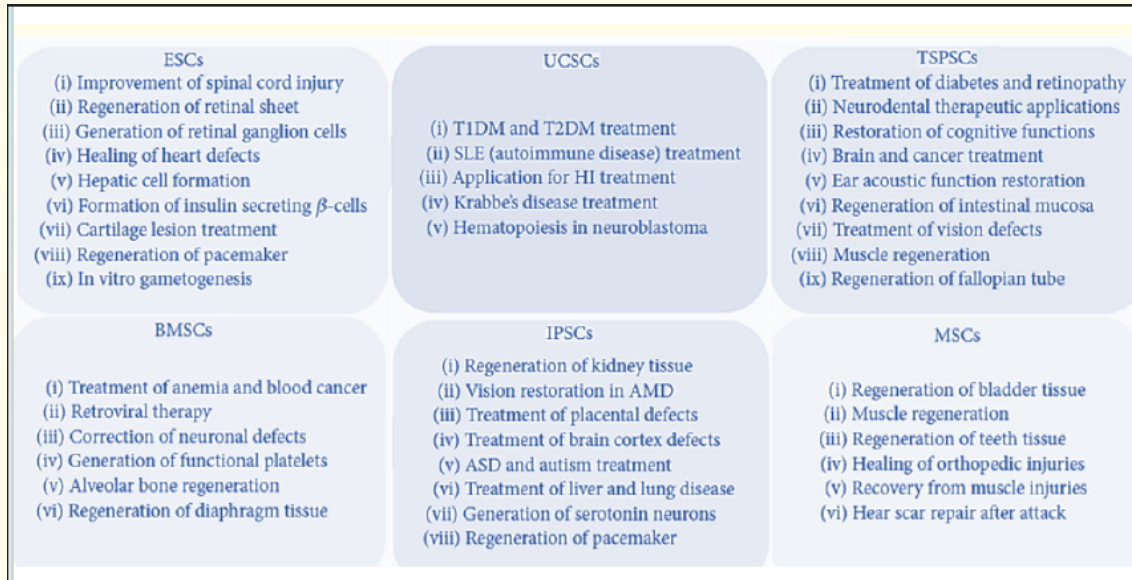
### **Insects as a viable and sustainable protein and food source for human consumption**

Insect ingestion by humans is a long-standing and widespread phenomenon that varies widely depending on local preferences for edible insects. Entomophagy, or eating insects as food, makes sense because it is nutrient-dense, long-lasting, and environmentally friendly. Furthermore, a growing population that will surpass current food production by 2050 and a progressive reduction in the regions used for food production worldwide have encouraged many countries to investigate insects as a food source. Insects have a similar nutritional content to traditional meats and, in certain circumstances, are even healthier than beef or chicken. These insects are high in the required proteins, lipids, minerals, and vitamins necessary for human development. On the other hand, the nutritional value of insects varies significantly from one bug to the next. Most insects are digestible by human gut enzymes and aid in maintaining the gut microbiome. Antihypertensive, antimicrobial, immunostimulatory, and antioxidant activities have been discovered in various insect bioactive chemicals. Although insect farming is beneficial, consideration of microbial pollutants, monitoring for possible negative consequences of insect ingestion, and new factors in specific safety regulations are paramount. However, given its growing popularity, entomophagy may become an accepted component of diverse civilizations worldwide.

Insects have nutritional content comparable to customary meats and, in specific cases, are more nutritious than beef or chicken. Insects are rich in proteins, lipids, minerals, and vitamins, essential for human growth and maintenance. However, insects' nutritional value can differ considerably from one species to the next. Most insects are digestible by human gut enzymes and help preserve the gut microbiome. Antihypertensive, antimicrobial, immunostimulatory, and antioxidant activities have been found in various bioactive chemicals seen in insects. Although insect farming is advantageous, microbial pollutants, the possible harmful effects on humans from insect consumption and further safety regulations must be assessed and addressed. Nevertheless, given its growing favor, entomophagy seems poised to become an acknowledged food source of diverse global cultures. Insect ingestion by humans is a historical and widespread practice, depending on edible insects' regional preferences. Entomophagy, or eating insects as food, is sensible and practical because it is nutrient-dense, long-lasting, and environmentally friendly. Furthermore, a growing population that will tax current food production by 2050 and the loss of regional food environments prompt many countries to investigate insects as viable and sustainable protein and food source [20].

### **A comprehensive review of stem cells and applications in specific diseases and regenerative therapy**

Stem cells (SCs) are undifferentiated progenitor cells present in multicellular organisms. They have the remarkable capacity to proliferate and differentiate into a wide range of various types of specialized cells. SC treatment has emerged as an intriguing research topic and an opportunity for new therapies. The breakthrough in SC research has provided the groundwork for cell-based therapeutics for diseases that traditional drugs cannot manage, such as ophthalmic disorders. Excellent outcomes have also been achieved in managing potential chronic medical conditions like diabetes and cardiomyopathy. SCs represent the frontiers of tissue regeneration due to their capacity for self-renewal and ability to develop into various types of cells. Clinical studies involving SC-based therapeutics have advanced exponentially in recent years. Since their discovery, improvements in SC research have been irregular; and many issues restrict their utility. Nonetheless, breakthroughs have occurred in understanding their molecular genetics. These challenges concern not just tumor development in animal studies and transplant rejection but also ethical and social considerations surrounding the use of embryonic cells. This comprehensive review of the history of SC research includes notable milestones achieved in the growth of this crucial field of biomedicine.



**Figure 7:** Stem cell potential in medicine; the six classes of stem cells: ESCs, TSPSCs, MSCs, UCSCs, BMSCs, and iPSCs—have significant beneficial possibilities in regenerative medicine and disease therapeutics.

With their restorative, transformational, and invasive abilities, stem cells could conceivably treat any cellular dysfunction disease by replacing those cells. They can potentially treat tumors more effectively and help patients with chronic disorders—such as stroke, dementia, and diabetes—raising the prospect of curing diseases previously considered incurable. Stem cell research regarding various conditions, including musculoskeletal ailments such as muscular dystrophy, is ongoing. However, certain aspects of stem cell research and potential clinical uses are fraught with controversy and ethical, legal, and social issues. A well-thought-out legislative effort might promote and secure the field's future advancement. Meanwhile, significant efforts are already being made worldwide to establish regulatory rules and standards to ensure patient safety. Furthermore, researchers are now ethically compelled to guarantee that ethical issues are not jeopardized in the quest for clinical translation success. Stem cell-based therapeutics will undoubtedly hold substantial potential as the future of this technology gains more widespread therapeutic usage and acceptance [21].

### **Pseudologica fantastica: evidence-based research elucidating the pathophysiology and presentation of pathological lying**

Pseudologica fantastica is also known as pathological lying or mythomania. It can be understood as a mental disorder with a compulsive urge to lie about big or small situations. The frequency of deception varies depending on the scenario to which people are exposed. Every day, a human tells an average of 1.65 lies; however, most are listed as occasional, harmless lies without mischievous intent and are often related to avoiding another person's feelings or problems. In contrast, pathological lies are compulsive and frequently expressed for no apparent gain or reason. Usually, the person is not daunted by the risk or guilt of being confronted. Pathological lying is generally triggered by guilt or shame to avoid any arising or possible conflict. However, pseudologia fantastica is typically characterized by creating dramatic and incredible stories to impress the surrounding people. They make a supplemental story if any new question arises. Detection and confirmation of a pathological lying diagnosis are challenging and require in-depth modifications to the prepared assessment procedures. Delusional and other psychotic disorders may present differently if the patient has complete conviction in the unreal and eccentric



stories. However, the thoughts are well-organized, and devised tales must reach the conviction level classified as delusional. This review covers an overview of pathological lying and specific aspects of its definition, characterization, pseudo dynamics, potential diagnosis, and treatment.

SI No	Characteristics and traits
1	Great storytellers with vivid, dramatic, fantastic, and detailed fiction
2	Lies can be convincing since they tend to portray themselves as natural performers.
3	Often tend to portray themselves as a victim or a hero
4	Repeating the same lies over the period, they tend to identify their lies as realities.
5	On confronting or discussing, they tend to speak restlessly without being specific to the question and thus act disproportionately without stating a clear objective.

Table 5: Key characteristics and traits of a pathological liar

With more studies, including epidemiological data, researchers can posit improved assessment and diagnostic measures, helping to assess the response. There is a need to spread awareness and education of this common phenomenon among mental and healthcare workers and those in the legal and law enforcement professions. This heightened awareness will establish a referral relationship and prepare the interventions that facilitate psychotherapy. Developing a supportive environment filled with emotions offering self-expression, impulsive control training, and adaptive advantages in truthfulness is needed [22].



Figure 8: The fundamental difference between normative and pathological lying

### Thoracotomy for chest trauma: An analysis of the indications and outcomes in UmuaHia, Southeast Nigeria

**Introduction:** Thoracic trauma directly accounts for 25% of trauma-related mortality and contributes to another 25% of cases. Significant progress has been made in thoracic surgical principles and procedures. Currently, more than 80% of chest injuries can be managed non-operatively.

**Citation:** Kerna NA, Holets HM, Carsrud NDV, Chawla S, Flores JV, Pruitt KD, Anderson II J, Ngwu DC. "A Compendium of the Review and Research Projects and Articles Conducted by the Independent Global Medical Research Consortium (IGMRC) in 2022". *EC Clinical and Medical Case Reports* 6.3 (2023): 43-74.

**Case report:** Evaluation of demographics, mechanisms of injury, indications for surgery, surgical approaches, and outcomes in patients who had an open thoracic operation following trauma in the first seven years at the Cardiovascular and Thoracic Surgery Unit, Department of Surgery, Federal Medical Center, Umuahia, Nigeria.

**Discussion:** Among other observations, a predominant finding was that patients with delayed thoracotomy had enhanced survival compared to those who underwent emergent or urgent procedures.

**Conclusion:** Mindful evaluation of chest trauma patients, optimal utilization of closed tube thoracostomy drainage, and rigorous adherence to an aseptic technique show that most chest trauma cases can be managed without open surgery.

Most cases of chest trauma can be managed successfully without the need for open surgery. Excessive chest tube output (massive hemothorax) is the most typical indication of mortality after thoracotomy for trauma. Careful evaluation of chest trauma patients, optimal utilization of closed tube thoracostomy drainage (CTTD), and strict adherence to an aseptic technique in the early phase of trauma care would further reduce the requirement for delayed thoracotomy due to retained hemothorax and empyema thoracis [23].

#### **Intussusception: a rare cause of acute abdomen in the adult**

**Introduction:** An Intussusception occurs when a segment of the bowel invaginates into its adjacent part. This condition occurs more frequently in children, particularly younger children, than adults. These invaginated bowel segments are the most common cause of pediatric bowel obstruction. There is one case of adult intussusceptions for every 20 childhood cases. Adult intussusceptions account for about 5% of all intussusceptions.

**Case report:** Here is the case of an older man who presented with acute abdominal pain of ten days duration. The diagnosis of intussusceptions was initially missed until it was suggested by an abdominal ultrasonogram and confirmed at laparotomy. An uneventful postoperative recovery followed primary resection and anastomosis of the involved gut.

**Discussion:** Most intussusceptions arising from the small bowel are due to benign lesions. Malignant lesions are more common in the large bowel. A benign ileal polyp caused the index patient's intussusception. However, previous healthcare providers initially misunderstood the condition, and specific and timely treatment needed to be identified and applied; bowel gangrene ensued. After an accurate diagnosis and appropriate surgical intervention, the index patient experienced a full recovery.

**Conclusion:** There is a need for primary care physicians and surgeons to maintain a high index of suspicion in this regard so that the rare case of adult intussusceptions can be diagnosed and treated early, leading to the best possible outcome.

Intussusception rarely occurs in adults, and when it does happen, the diagnosis is likely to be delayed or missed owing to varying presentations. These consequences could lead to complications arising from undue intervention delay. A high degree of suspicion by the primary care physician and surgeon is needed if the desirable rapid preoperative diagnosis followed by expeditious surgical intervention is to be achieved [24].

#### **Acute limb ischemia: An uncommon complication of long bone fracture**

**Introduction:** Vascular injuries associated with limb bone fractures are surprisingly uncommon, with a reported incidence of less than 3%. When these injuries occur, there is a threat to the life of the affected limb and the patient. Delay in diagnosis of concomitant vascular trauma is the leading cause of amputation in this limb-threatening (and life-threatening) injury.

**Case report:** A 52-year-old victim of a pedestrian-motor vehicle crash was brought to our emergency room about an hour after the incident. History, tests, and imaging corroborated the diagnosis, and treatment ensued. The result 6 months later is of a well-perfused,

sensate left leg and foot with good motor functions; the contralateral tibia/fibular fracture has also shown good union, and he is currently undergoing rehabilitation on an outpatient basis.

**Discussion:** The mechanism of vascular injury caused by blunt trauma involves vascular occlusion secondary to thrombi of the ruptured vascular intima. The threat in this setting is not only to the life of the affected limb but also to the injured individual's life. Therefore, in managing vascular injuries associated with fractures, the principles of resuscitation, early and accurate diagnosis, revascularization, soft tissue preservation, and fracture stabilization should be pursued as much as possible. Physical findings of signs of arterial injury are usually sufficient for preoperative diagnosis. However, angiography becomes necessary in the unsure presence of a distal pulse, especially in cases of blunt trauma. Classical angiography, however, leads to 1 – 2 hours of wasted time and may lead to the aggravation of ischemic severity. Single-shot angiography in the operating room avoids such wasting of time.

**Conclusion:** A limb fracture with concomitant arterial injury puts the life of the limb and the patient at significant risk. The gross features of distal ischemia in a patient with a limb fracture should alert the clinician immediately to potential associated arterial injury, allowing for prompt resuscitation, evaluation, and repair—often without further diagnostic tests.

A limb fracture with concomitant arterial injury puts the life of the limb and the patient at significant risk. The gross features of distal ischemia in a patient with a limb fracture should alert the clinician immediately to potential associated arterial injury, allowing for prompt resuscitation, evaluation, and repair—often without further diagnostic tests [25].

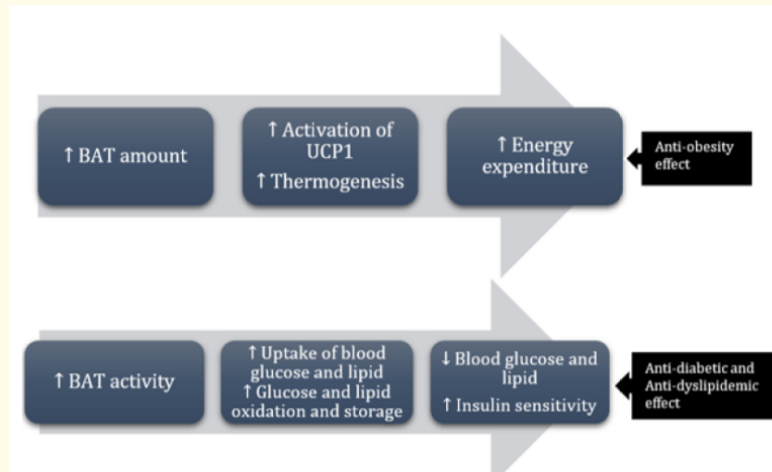
#### **A rare giant pericardial cyst with atypical clinical presentation—A case report**

Pericardial cysts are typically benign congenital lesions of the pericardium—located generally at the right costophrenic angle (70 – 75%) and less frequently at other sites. They are typically asymptomatic and incidentally found in imaging investigations. Some larger tumors become symptomatic due to their local effects on surrounding structures or complications, such as cyst infection or rupture. Highly-sensitive cross-sectional imaging modalities, like CT and MRI, are frequently employed for preoperative diagnosis confirmation and to exclude differential diagnoses, including other mediastinal cysts, hematomas, and neoplastic masses.

Surgical excision is the treatment mainstay, but less-invasive therapeutic measures have been successful in a select few. The prognosis following successful excision is excellent. Smaller, asymptomatic lesions should be initially monitored and treated if symptoms develop, complications exist, or appear imminent. We report the case of a large pericardial cyst with atypical symptoms of singultus (hiccups) and acid reflux (heartburn). The cyst was surgically excised to relieve the patient's symptoms and forestall the development of possible complications [26].

#### **Brown adipose tissue: A comprehensive review**

Studies on the physiology of different types of fat deposition have increasingly recognized adipocytes as an essential endocrine organ with diverse metabolic activities. Human fat consists of white adipose tissue (WAT) and brown adipose tissue (BAT). WAT helps in energy storage, whereas BAT helps in energy consumption. Increased WAT levels may play a role in progressing metabolic abnormalities and cardiovascular events. On the contrary, the thermogenic function of BAT allows for significant fatty acid intake due to the activation of uncoupling protein 1 (UCP1) in the internal mitochondrial membrane. In vertebrates, the sympathetic nervous system (SNS) stimulates the thermogenesis of BAT in response to cold, helping to maintain the body temperature. BAT may be a promising therapeutic target for weight reduction and improving metabolic function. Furthermore, activation of BAT is associated with heightened glucose metabolism. This review encompasses the research on human BAT, including its functions and differentiation processes, its potential as a new therapeutic target for managing metabolic illnesses, such as obesity and diabetes, and its possible future applications.



**Figure 9:** Obesity and associated metabolic diseases are treated by targeting BAT.

Modern comprehension of the activities of BAT has progressed, and it is clear that the tissue performs several functions beyond temperature regulation. Following substantial proof of its existence and versatility in metabolism in adult humans, there has been a resurgence of interest in BAT over the past decade. According to recent studies, the average adult BAT reacts to cold stimulation in acute and long-term situations and is controlled by adrenergic activation. In addition, the discovery of beige adipocytes and the phenomenon of WAT browning have contributed to the identification of BAT as a targeted therapy for managing metabolic disorders. The FDG-PET/CT is a routinely used technique for detecting BAT, although additional methods, such as IT and DECT, are being investigated [27].

### Vertebral artery dissection (VAD): Causes, consequences, and differential diagnoses

The vertebral arteries, which supply blood to the brain's posterior circulation, are clinically most significant. A rupture in a major cervicocerebral artery causes blood to penetrate the arterial wall and divide its layers, resulting in stricture or aneurysmal vessel dilation. Vertebral artery dissection (VAD) is of particular concern in the patient due to its typical late appearance and association with the risk of chronic neurological damage or even trauma-related death. VAD is one of the leading causes of stroke in patients under 50 years of age and generally manifests as a migraine with and without neck pain. Hereditary factors, underlying arteriopathy, or stretching or swelling of the arterial wall can cause VAD. The increasing availability and use of computed tomography and magnetic resonance imaging have contributed to an improved identification rate of what was once a rare injury. VAD therapy aims primarily to prevent vertebrobasilar ischemia. This objective is accomplished by intravenous heparin anticoagulation with an adequate activated partial thromboplastin time. The activated partial thromboplastin time should be at least double the base value. Other therapeutic options are endovascular revascularization or surgery. Recent advances in the epidemiology and pathophysiology of VAD, as well as clinical presentations, diagnostic tools, and therapeutic options, are reviewed in this article.

The pathology of VAD remains unclear. However, it has a multifaceted etiology, including genetic and environmental components. VAD is critical in young and middle-aged patients with stroke. At least 40% of all ischemic strokes in the posterior fossa are because of VAD. One of the most prevalent symptoms of VAD is a headache with or without neck discomfort. The primary goals of VAD treatment are to avoid stroke and improve neurological outcomes. Anticoagulation is used to prevent clot formation, propagation, and emboliza-

tion. Antithrombotic medication therapy is empirical rather than based on evidence. Thus, randomized controlled studies must compare anticoagulants and antiplatelets [28].

### **Vaping: a comprehensive and concise review resource regarding the beneficial effects, indications, adverse effects, and contra-indications of smoking e-cigarettes on various human body systems**

Vaping is smoking with electronic cigarettes (e-cigarettes). These battery-powered devices help users emulate the smoking experience by inhaling and vaporizing fluid within the device. Although tobacco is not a component of e-cigarettes, nicotine can be present in the form of a liquid solution. Vaping has increased among teens and young adults in recent years, possibly due to its alluring flavors and apparent lack of adverse health consequences compared to traditional cigarettes. Legalizing nicotine-containing e-cigarettes has dramatically increased access to vaping e-cigarettes among smokers, providing consumers with additional alternatives to quit smoking or ingesting nicotine. However, the health risks and benefits of using electronic cigarettes as an alternative to traditional cigarettes made from combustible tobacco are a matter of contention. Several studies have reported that vaping with electronic cigarettes can worsen respiratory or cardiovascular conditions. Despite these data, many users believe that vaping is a healthier alternative. This article reviews the history of vaping, dependence, prevalence, incidence among teenagers and young adults, negative repercussions, medical expenses, and societal financial burden. It also provides readers with a concise and balanced overview of existing evidence on the health effects of vaping e-cigarettes and their effectiveness in quitting smoking compared to conventional smoking.

Vaping using e-cigarettes has revolutionized public health, especially by lowering the severe health disparities from smoking. Adults using e-cigarettes can provide several reasons for continuing the habit, such as that it helps them stop smoking cigarettes and allows them to consume nicotine in places where smoking is not permitted. Studies further support the idea that vaping can help to quit smoking. Contrary to traditional smoking, vaping poses fewer risks but is not entirely risk-free. More toxicological research, particularly studies on the long-term consequences of vaping, stricter sales controls, adequate industry oversight, and taste limitations, are warranted [29].

### **Comedy cures: laughter therapy's hormonal, neurological, and mechanistic effects on the cardiovascular, musculoskeletal, immunological, and respiratory systems and common psychological disorders**

The ability to laugh is a trait shared by all people; studies have shown a positive association between humor and general health. Both humor and laughter therapy, a cognitive-behavioral therapy, have demonstrated verifiable psychological and physical benefits in certain health aspects—given that it lowers blood levels of cortisol, epinephrine, growth hormone, and 3,4-dihydro-phenylacetic acid. Laughter therapy can be applied to certain psychological conditions. Furthermore, research has shown that laughter therapy is beneficial for body temperature, blood pressure (BP), respiratory rate, musculoskeletal activity, and brain activity (enhancing well-being and improving the quality of life (QoL) of those who are stressed). On the other hand, humor has improved communication, motivation, engagement, and performance. As a complement or primary therapy, laughter-inducing or humor therapies might be cost-effective for specific groups with psychological problems. This review aims to outline the history of humor and laughter in healthcare and investigate the psychological effects of humor and laughter on issues related to pain, heart, autoimmune system, and mental health. The future of laughter therapy and a thorough analysis of laughter exercises and their promotion in hospital settings are also discussed.

One of human communication's most distinguishing and enigmatic aspects is laughter, which has recently received attention in the general press and medical literature as an alternative therapy. Laughter therapy encourages physiological, emotional, and psychological engagement, improving the QoL. Laughter therapy can also be used with other prophylactic and rehabilitative therapies. These dual interventions have been proven to improve mental health and the immune response. Additionally, humor and laughter in the healthcare industry can be relevant to patients while receiving treatment, the relationship between the patient and the caregiver, the psychological happiness of healthcare professionals, and the effect of the environment on group dynamics [30].

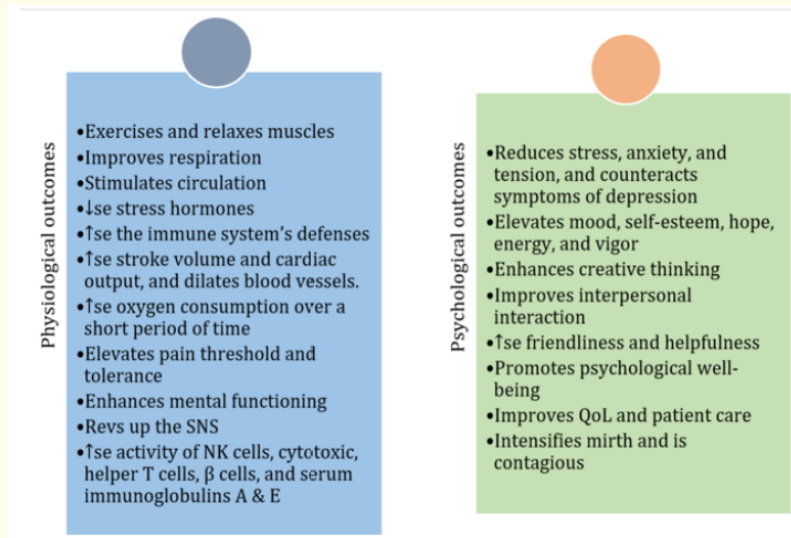


Figure 10: Effects of laughter

### Manipulation under anesthesia (MUA): a comprehensive 30-minute primer

Manipulation under anesthesia (MUA) is a multidisciplinary method for treating musculoskeletal conditions. Although several medical experts practice it, only those having experience in MUA research and accreditation in the technique are supposed to perform MUA procedures. MUA helps regain the optimum range of motion (ROM). It is based on improving mobility gradually rather than in large amounts each day to achieve desired effects in ROM and pain reduction. Although the literature supports the positive results achieved from MUA, data on treatment effectiveness are limited. Furthermore, published studies are often poor in methodological rigor and vary across domains, preventing generalization. This review discusses the history and analyzes studies on the benefits and standardization of diagnosis, procedure, certification, and treatment of MUA.

Although MUA is widely documented, future studies must assess the advantages of extra patellofemoral joint manipulation or anti-inflammatory medicines during the procedure. In addition, repeat MUA operations require special care, and efficient post-MUA rehabilitation strategies should be developed based on the findings of randomized clinical studies. MUA is a process of mobilization, stretching, and traction operations performed with the patient under sedation. It is an acknowledged treatment approach for conditions such as adhesive capsulitis, broken bones, knee arthrofibrosis, displacement, and constriction. Typically, only a single MUA session is required for specific problems—most commonly performed unilaterally and involving a single joint. MUA is an established and respectable procedure (not an exploratory or experimental technique) worthy of insurance coverage and consideration by physicians and patients [31].

### A retrospective observational report of amateur female youth volleyball athletes (2022), postliminary to the COVID-19 pandemic apogee

On Memorial Day weekend of 2022, after having no sporting event for 2 years, 1800 to 2000 athletes gathered at Emerald City Classic Invitational volleyball tournament in Seattle, Washington, USA. Providers from the Integrative Medicine Group (IMG), a nonprofit group, and student volunteers from Bastyr Sports Medicine Club provided young athletes with treatment and case management [32]. The fol-

lowing procedures were utilized: concussion assessment and management, fracture assessment, small joint dislocation assessment and management, hypoglycemia management, injury prevention with athletic taping, Kinesiology taping, evaluation of soft tissue injury, soft tissue release, joint manipulation, and counseling. A total of 155 athletes were assessed and treated over 3 days.

IMG was prepared to provide more care and management than before COVID-19 due to concerns about increased injuries with runners who self-reported a diagnosis of COVID-19 [33] and increased muscle strain after a SARS-CoV-2 infection [34].

Retrospective analysis results show no significant increase in the total number of athletes' treatments compared to 2019, before the COVID pandemic. During day 1, the focus on prevention and use of athletic and Kinesiology tape was high. Athletes were probably experiencing musculoskeletal fatigue on day 3. Hamstring, knee, and back care was provided more, along with soft tissue care and Kinesiology taping. By day 3, more treatments were delivered across all age groups. The possible reason for the increased number of treatments on day 3 could be because the athletes were tired, as expressed by the athletes themselves. Further investigation of athletes' energy levels each day would determine the correlations. There was concern about athletes after COVID; however, no significant injuries arose except 2 ankle fractures and a total of 9 concussion assessments. Concussion needs further investigation by following athletes for possible post-concussion syndrome and return to play schedule [35].

### **Binaural beats: novel approach to managing certain physiological and psychological conditions**

Binaural refers to something relating to or involving both ears. When 2 sounds of slightly different frequencies are heard simultaneously by different ears, the brain combines these 2 signals and creates a binaural beat, perceived as a new, third sound. The effects of BB stimulation on the brain are considerably similar to those experienced during meditation. The frequency-following response (FFR), the tendency of cortical potentials to tune or resonate at the frequency of an external stimulus, can be used to create BB to entrain specific brain rhythms. Thus, it is possible to entrain a clear cortical rhythm using a precise BB frequency as a consciousness management technique. BB are a novel sound wave therapy with the potential to regulate behavior, cognition, and physiological factors such as blood pressure, anger, and stress. The electroencephalographic FFR in the brain and the BB appear to be associated. Multiple studies supporting the effectiveness of BB therapy have involved small cohorts and used subjective metrics such as questionnaires. Few high-quality recent studies have supported BB therapy's success in treating anxiety. Despite this, there are contradictory data on BB therapy's clinical benefits. Although not approved as a mainstream therapy, physicians evaluate it as a semi-experimental treatment to manage some psychological issues. Additionally, individuals can practice BB therapy in the comfort of their homes, as no training is required, and this trend is growing.

According to certain studies, BB increase focus and attention while promoting relaxation and reducing stress and anxiety. Unlike everything else in the wellness industry, there is no consensus on how effectively or even if they work. It needs to be made clear how BB affect most physiological functions. Although one study discovered that BB improved body functionality, other investigations found either no or a detrimental effect. Significant studies in a large population and prolonged BB therapy are warranted to make any firm decisions regarding accepting BB for treating a particular condition [36].

### **Prevalence of extended-spectrum $\beta$ -lactamase-producing Enterobacteriaceae rectovaginal colonization among healthy pregnant women: a comprehensive review**

Several members of the *Enterobacteriaceae* family produce extended-spectrum  $\beta$ -lactamases (ESBL), which hydrolyze extended-spectrum cephalosporins. Clavulanic acid has been effective in inhibiting ESBL. Since their discovery in the early 1980s, ESBL producers are increasingly found in patients with hospital-associated and community-acquired infections. CTX-M enzymes replace SHV and TEM enzymes as the most common ESBLs, mainly in community-acquired *Escherichia coli* infections. The most common infections requiring hospitalization are urinary tract infections (UTIs), pneumonia (*Klebsiella pneumoniae*), endocarditis, peritonitis, birth problems in neonates, bloodstream infections (BSIs), and intra-abdominal infections (IAIs). Affected patients often have several underlying risk factors. Antibi-

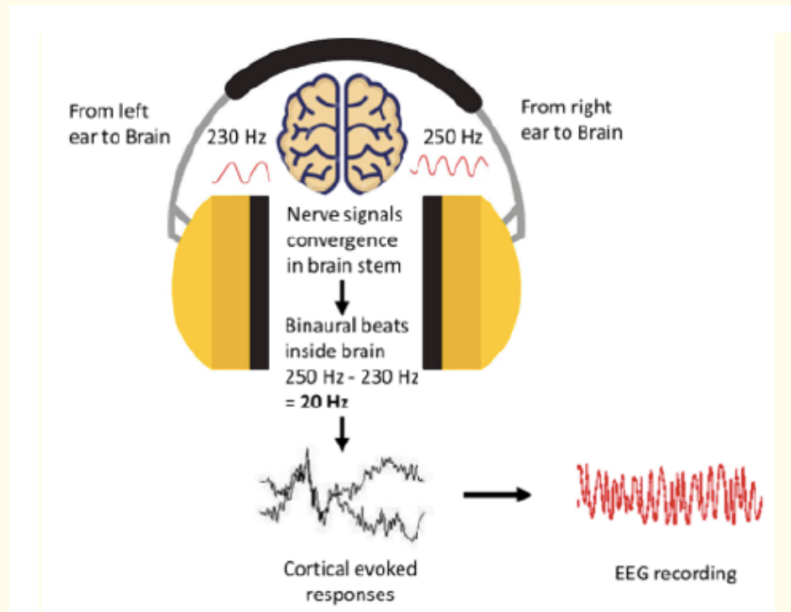


Figure 11: Formation of binaural beats

otic misuse or overuse of antibiotics is a well-recognized key contributor to the emergence of new diseases, the development of resistant bacteria in individual patients, and the global spread of antimicrobial resistance. Therefore, antibiotics must be used with caution. The obstruction of drugs imparted by ESBL and co-resistance to different antimicrobial families—such as fluoroquinolones, aminoglycosides, cephalosporins, and trimethoprim with sulfamethoxazole—limit treatment decisions for ESBL-associated infections. Clinical evidence on the efficacy of drugs to manage ESBL-associated infections needs to be more comprehensive. Although several cephalosporins appear to be active *in vitro*, their clinical effects are poor in clinical settings.

Pathogens from the *Enterobacteriaceae* family are significant sources of infections. Many family members are becoming increasingly resistant to the antibiotics currently available. ESBLs are examples of the increasing number and variety of compounds that inactivate the  $\beta$ -lactam type of antibacterials. Drug resistance and the ability of these microbes to adapt to their environment are demonstrated by coupling these enzymes with other resistance features. A multifaceted approach is recommended to effectively treat infections caused by these bacteria, including continued research and innovation of novel antibacterial classes, more prudent use of established agents, and greater dependence on impactful preventive measures [37].

### Causes, consequences, and differential diagnoses of spinal muscular atrophy (SMA)

Mutations in the surviving motor neuron 1 gene (SMN1) cause an autosomal recessive condition known as spinal muscular atrophy (SMA), characterized by the degeneration of motor neurons in the spinal cord. SMA is characterized by generalized muscle weakness and atrophy predominating in the proximal limb muscles. The phenotypic is divided into four severity classes (SMA I–SMA IV) depending on the onset age and the motor function level achieved. Differential diagnosis should be investigated for various neuromuscular diseases—disorders that do not present as infantile hypotonia or limb-girdle muscle weakness later in life and are not associated with elevated CK.



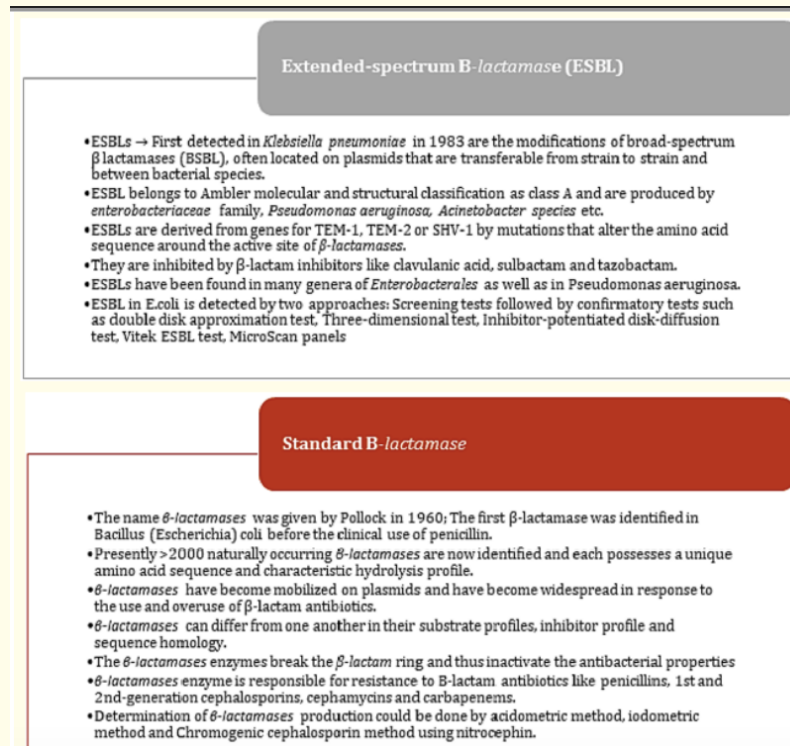


Figure 12: Differences between extended-spectrum  $\beta$ -lactamases (ESBLs) and standard  $\beta$ -lactamases

The therapeutic options available to these patients have significantly changed in recent years. These options include gene therapy, muscle promotor therapies, up-regulation or down-regulation of modifier genes, and clinical trials of genetic-modifying treatments to improve the level of SMN protein indirectly and, thus, strength. Nusinersen, zolgensma, and risdiplam are three different disease-modifying medications made available in the past four years. These medications have been proven to be both safe and effective. Various drugs are being investigated; some are new, while others are well known, including valproic acid, salbutamol, or myostatin. However, paralysis can be stopped but not reversed. This overview covers the history, definition, pathophysiology, types, epidemiology, causes, consequences, diagnosis, differential diagnosis, therapy, and future.

SMA is a motor neuron disease that affects infants, children, and adults, and its genetics and pathophysiology have been extensively studied over the last two decades. The knowledge of the many SMA subtypes and the development and dissemination of standard-of-care guidelines have benefitted from this enhanced attention. The past several years have seen sustained advances in understanding SMA's molecular genetics and etiology, creating a rare opportunity for logical and successful treatment trials. Increasing the expression levels of the SMN protein in the appropriate cells at the correct times is the objective of SMA treatment. Now that this goal is within reach, researchers are better equipped to screen prospective therapies *in vitro*, test them in precise, trustworthy animal models, advance promising treatments to clinical trials, and correctly identify patients at an early or presymptomatic disease stage [38].

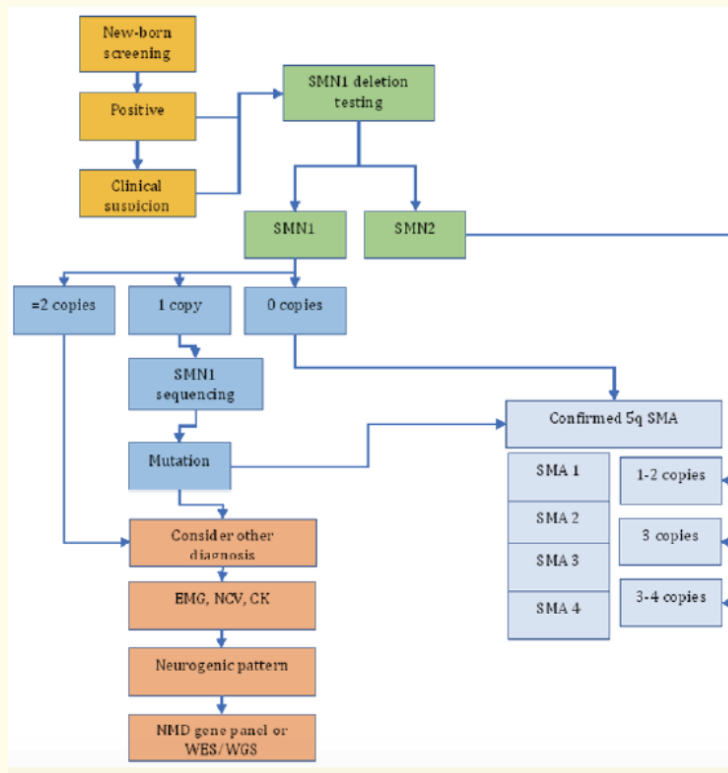


Figure 13: SMA diagnosis algorithm

### Revealing the health applications of gold nanoparticles for the cardiovascular system (and in nerve, bone, immune, skin, and mental disorders)

The prospects of healthcare systems and their results may be influenced by nanotechnology. Researchers have recently become very interested in gold nanoparticles (AuNPs) because of their superior physicochemical characteristics. AuNPs exhibit size- and shape-dependent optical and electronic properties and are noncorroding, biocompatible, and amenable to the desired functionalization. Due to their exceptional qualities, AuNPs have the potential to be used in a wide range of biomedical applications, such as optical bioimaging, targeted drug delivery (TDD), immunoassays, medicinal diagnostics, laser phototherapy of cancer cells and tumors, and genomics. AuNPs bind readily to proteins, antibodies, enzymes, and cytokines. However, particle size may affect how it is distributed throughout the body. AuNPs are FDA-approved metallic nanoparticles that have shown great promise in several medical applications. To target cancer cells, researchers used nanogold to bind specific antibodies. AuNPs have antioxidant and anti-inflammatory properties that can help with maladies triggered by inflammation and reactive oxygen species (ROS). Also, AuNPs have been claimed to treat rheumatic, mental, neurological, bone, cartilage, cardiovascular, and skin disorders.

Moreover, AuNPs have been shown to boost immunity. This review aims to provide an overview of the historical corporal use of gold throughout the ages—to the present, how AuNPs are synthesized, how they affect human physiology, toxicity, potential positive effects, and their future applications.

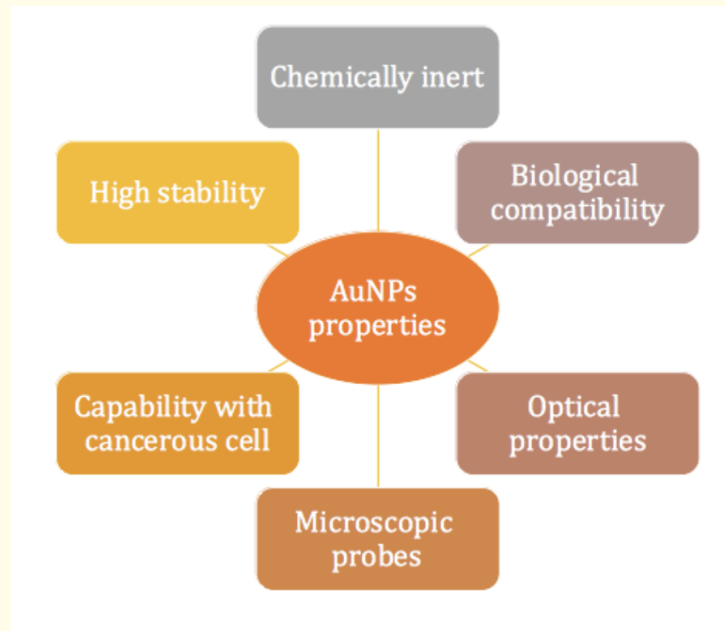


Figure 14: Properties of AuNPs [39]

AuNP is unique, as its intriguing properties can be used for imaging and therapeutic applications. Many studies have shown that AuNPs are helpful to humans because of their functional pharmacological qualities in various disorders. Furthermore, considering their high surface loading of medication and genes and regulated release of payloads, AuNP-based delivery vectors have shown promise in therapeutics. Although there are several recommendations for potential AuNP-based systems for drug administration, treatment, imaging, or imaging in the scientific literature, only some of these systems have been evaluated in human trials, and regulatory bodies have formally authorized none. Many questions about the fate of AuNPs after medicinal use and their possible toxicity still need to be answered. Some researchers have found that AuNPs are not harmful; however, many other investigations have found the opposite. The toxicity of gold nanoparticles may be directly related to the size of the particles, shape, surface potential, dosage, and production technique. As a result, more extensive toxicological experiments are required to demonstrate the safety of AuNPs in therapeutic settings. Most AuNP-related preparations are now in clinical trials. Increasingly, nano-related formulations will enter clinical therapy and diagnostics of diseases in the future, making AuNPs more significant in biomedicine [40].

### Beyond weight loss: a comprehensive and concise review of the ketogenic (Keto) diet from epilepsy origins to weight management

The ketogenic diet (KD) is a high-fat, adequate-protein, and very low-carbohydrate diet that stimulates the creation of ketones by mimicking the metabolism of the fasting state. A high level of blood ketone caused by a KD induces the state of ketosis, which has several physiological and therapeutic advantages. The KD first gained popularity as an epilepsy treatment in the 1920s and 1930s. It has rapidly attracted research interest in the last 20 years due to mounting evidence of the KD's promising therapeutic potential for other diseases besides epilepsy, including obesity, neurodegenerative diseases, and malignancies. The KD alters multiple cellular signaling cascades, receptors, and biomarker levels in various medical situations. KD therapy differs from the typical Western diet in that it focuses on nutritional

supplements, electrolytes, and hydration in addition to the diet. If the KD is followed closely, significant dietary changes can positively affect the dieting individual. However, several treatable short and long-term adverse effects are linked to the KD. It may be challenging to follow the KD long-term if some of the most enjoyable meals are not allowed.

Many physicians are considering including KD programs in the therapeutic regimen in light of the importance of lifestyle modification in managing diseases. However, before this can be advised, doctors must ensure its efficacy and safety, and further human research is necessary. Distinct economic opportunities will soon arise as a result of the potential medical benefits of the KD. These safeguards and limitations can therefore be used to develop distinctive and personalized interventional procedures replicating the effects of a KD or as promising drug development targets.

<b>Contraindications to KD</b>
● <b>Liver failure</b>
● <b>Kidney Disease</b>
● <b>Type 1 diabetes</b>
● <b>Concomitant use of SGLT-2 inhibitors</b>
● <b>Pregnancy</b>
● <b>Breastfeeding</b>
● <b>Cardiac arrhythmias</b>
● <b>Recent stroke or myocardial infarction</b>
● <b>Heart failure</b>
● <b>Respiratory failure</b>
● <b>Elective surgery or invasive procedures</b>
● <b>Increased serum uric acid and abnormal lipid profile</b>

*Table 6: Contraindications associated with the KD*

The KD was designed initially as an epilepsy treatment in the 1920s and 1930s. Since then, the KD has shown potential applications in treating various conditions beyond epilepsy, such as obesity, neurodegenerative diseases, and malignancies. For all of its potential benefits, the KD is challenging to maintain in the long term due to its strict dietary regime. Nevertheless, physicians—becoming increasingly aware of the KD’s potential beneficial applications— recommend the KD in lifestyle modifications for specific conditions. That said, some physicians remain uncertain of the KD’s efficacy and safety. The ketogenic diet is a high-fat, very low-carbohydrate diet, containing adequate protein intake and utilizing nutritional supplements, electrolytes, and hydration. This dietary combination creates ketones, similar to the fasting state. Controlled ketosis has distinct physiological and therapeutic advantages, e.g., altering multiple cellular signaling cascades, receptors, and biomarker levels in specific conditions. However, the ketogenic diet requires close monitoring as its dietary changes could adversely affect the dieting individual [41].

## Conclusion

All tolled, thirty-four article highlights have been collated herein. The article topics are varied and diverse, which—the authors hope—are of value to the reader and spark interest in pursuing further research on these specific or related concepts and findings.

## Conflict of Interest Statement

The authors declare that this paper was written without any commercial or financial relationship that could be construed as a potential conflict of interest.

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