

Science of Healthy Living & Longevity:

Practical Tips on Wellness & Anti-Aging



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This book is basically a compilation of information / literature available on the topic, from various sources (which have been acknowledged duly). However, this is by no means an exhaustive resource, since the field is evolving at a very rapid pace. Every effort is made to ensure accuracy of material, but the publisher, printer and author will not be held responsible for any inadvertent error(s).

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"To Prevent the Preventable
And to Delay the Inevitable"

"The idea is to die young...
as late as possible"

- Anthropologist Ashley Montagu

"Anti-aging treatments are not just
about extending years to life, but
adding life to those years,
empowering us to embrace vitality
and wellness at every stage"

"It's not the years in your life that
count. It's the life in your years"

- Abraham Lincoln

"It is health that is real wealth and
not pieces of gold and silver."

- Mahatma Gandhi

दुःख में सुमिरन सब करे,
सुख में करै न कोय।
जो सुख में सुमिरन करे,
दुःख काहे को होय॥

- संत कबीर दास

"An ounce of prevention is
worth a pound of cure."

- Benjamin Franklin

P R E F A C E

Stresses of modern living put pressure on both the body and mind which results in an acceleration of the degenerative processes that results in aging. We all know that aging is inevitable, but there are diseases and disorders associated with aging that can be prevented by lifestyle changes and simple anti-aging treatments. So a good definition of anti-aging is “To Prevent the Preventable And to Delay the Inevitable”. A major recent advance in anti-aging is the availability of a biomarker for aging called telomere. Through a simple blood test that measures telomeres, we can now determine our cellular age. Also, the telomere can tell us whether anti ageing treatments are reversing age at a cellular level. The best anti-aging lifestyle measures include (i) A healthy nutritional diet (ii) Drinking adequate water (iii) 30-45 minutes of exercise (iv) 8 hours sleep (v) yoga and meditation. Lifestyle changes take time to reverse existing damage, but simple integrative therapy are now available such as hyperbaric oxygen therapy, ozone therapy, gut cleansing, micro-nutrient supplementation, etc that have scientifically shown to detoxify and regenerate the degeneration and damage. When diseases like diabetes, ischemic heart disease, cerebrovascular diseases, osteoarthritis set in, then these need to be treated with medical and surgical methods. Age related diseases such as Dementia can be helped by cellular therapy, which also has the potential of helping in the aging process. The purpose of Anti-Aging treatments is not to treat diseases but to prevent it.

Our advise to the readers of this book is as follows:

1. Please understand the scientific and biological principles of cellular aging.
2. Bring about lifestyle changes that are suggested in this book.
3. Take advantage of the simple integrative therapies that are now available in dedicated hospitals such as KLS Wellness Institute to detoxify and rejuvenate your bodies and help you live a healthy and younger life.

Dr. Alok Sharma

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SECTION A

Introduction to Anti-Aging



CHAPTER *One*

What Is Aging?

Aging is an intrinsic part of the natural life cycle, manifesting as gradual weakening of both body and mind, often accompanied by various incapacitating symptoms. It begins when the body's own intrinsic powers fail to maintain and repair itself to work efficiently.

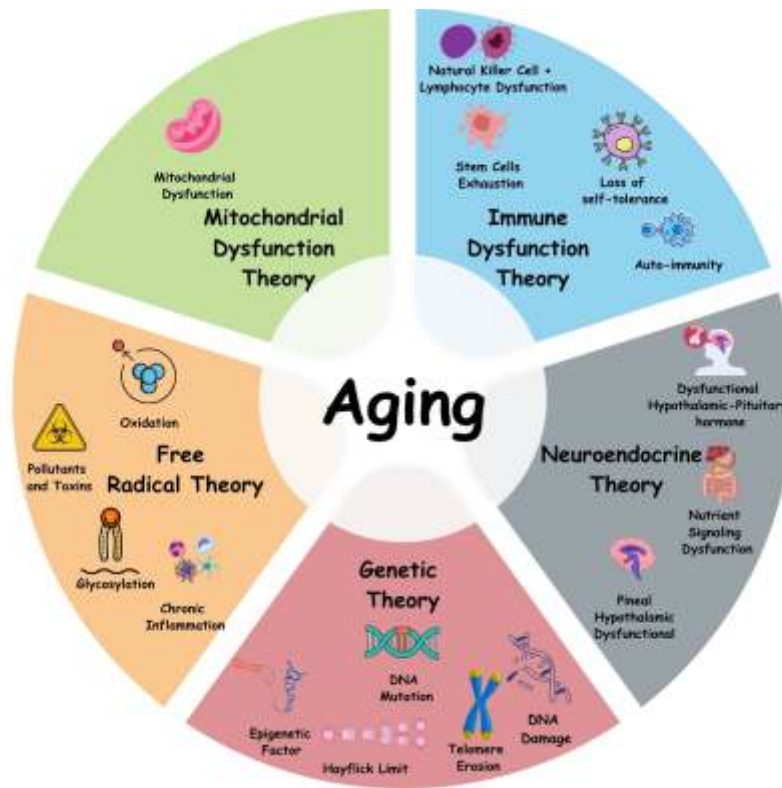
Biologically, aging results as a consequence of accumulation of a wide variety of molecular and cellular damage over time leading to functional impairment along with increased risk of disease and untimely death.

Although we typically observe aging externally, the true aging process begins at the cellular level as early as 20 years of age, affecting organs throughout the body and leading to the progressive decline of physiological functions. However, the speed of aging is influenced by various factors such as genetics, lifestyle and external environmental influences.

At cellular level, changes include Genome instability, Mitochondrial dysfunction, Telomere shortening, Oxidative stress, Inflammation, Cellular senescence, Exhaustion of stem cells, Altered intercellular communication, Hormonal Imbalance amongst others.

Hallmarks of Aging

Aging is a complex process involving gradual changes of multiple factors that interact with



each other. Some important factors that influence aging process also known as hallmarks of aging are listed below:

1. **Genomic Instability:** Genetics play a 10-15% role in aging of individuals. Genes affect how cells process and repair themselves, as well as the rate at which collagen and elastin break down thereby influencing how quickly people age. Our DNA is incessantly being damaged due to various external and internal factors throughout the day. Most of the damage is repaired efficiently by the body's mechanism. However, as humans age, defects appear in the repair mechanism, which eventually leads to accumulation of unrepaired DNA causing cellular dysfunction and also occurrence of premature aging. Additionally, DNA damage can also lead to a reduction in cell function or even drive cells into senescence, which can contribute to the loss of organ function in old age.
2. **Mitochondrial Dysfunction:** Mitochondria are small organelles in the cell which are known as "the power house of the cells". They also form a central hub for metabolic processes in the cell. These mitochondria contain their own DNA- mtDNA which codes for the proteins needed for respiration. They use oxygen to produce energy in a process called mitochondrial respiration and produce reactive oxygen species (ROS) as a by-product. These free radicals can damage other macromolecules such as DNA, lipids and proteins and are therefore potentially harmful to the cell. Mutations and deletions in the mtDNA may influence aging. It could lead to deficit in the respiration process, defects in energy production, lead to increased production of ROS, and induce

apoptosis (cell death). Additionally, Mitochondria dysfunction could also cause a deficit in the respiratory chain, trigger inflammation, which causes a variety of age-related diseases. An imbalance in the mitochondrial network and impaired mitochondrial function may also lead to an imbalance in the metabolic state of skeletal muscle and a decrease in muscle mass.

3. **Telomere shortening:** Telomeres are DNA structures present at the ends of chromosomes of the human genome. They protect the genome from degradation, unnecessary recombination and chromosomal dysfunction. Therefore they play a vital role in preserving information in the human genome. As a normal cellular process, when a cell divides, a small portion of telomere is lost. When telomere length reaches a critical limit, the cell undergoes senescence and/or apoptosis. Telomeres shorten with age and rate of telomere shortening may indicate the pace of aging. Telomere length is affected by a combination of factors including age, genetic, epigenetic make-up and environment, social and economic status, exercise, body weight, and smoking. Lifestyle factors such as smoking, obesity, lack of exercise, and unhealthy diet can increase the rate at which telomere length shortens, leading to age-related disease such as coronary heart disease, heart failure, diabetes, increased cancer risk, and osteoporosis and/or premature death.
4. **Epigenetic Alteration:** Genetic information is largely consistent across all cells in the body throughout an individual's lifespan. However, epigenetic information, i.e. the information which controls the gene activity without changing the DNA itself, varies between cells and changes in response to the environment and over time. It is believed that loss of epigenetic information, resulting in changes in gene expression, leads to the loss of cellular identity. Information Theory of Aging, proposes that a loss of information, especially epigenetic information, triggers a cascade of events, including mitochondrial dysfunction, inflammation, and cellular senescence, leading to a progressive decline in cell and tissue function, manifesting as aging and age-related diseases.
5. **Oxidative Damage:** According to a prominent theory, aging is caused by changes in our metabolism indicating that aging is a natural byproduct of metabolism. A slow and steady accumulation of oxidative damage (i.e. increase in free radicals and not enough antioxidants to neutralise them which harms cellular components like DNA, proteins, and lipids over time) is associated with aging.
6. **Cellular senescence:** Cellular senescence is a state wherein cell cycle gets arrested and cells stop dividing, lose their original function and release harmful molecules. These senescent cells also negatively impact the neighbouring cells leading to organ damage. It is believed that aging is caused by a large accumulation of senescent cells in the tissue. Several mechanisms are known to trigger cellular senescence including telomere shortening, mitochondrial dysfunction, oxidative stress, etc
7. **Exhaustion of stem cells:** With age, most cells and tissues lose their ability of self-renewal. Therefore, most organs rely on stem cells to repair tissue damage or to promote tissue renewal. Stem cells have the ability to divide and differentiate into

different cell types. They play a vital role in keeping our organs and body healthy. Aging negatively affects stem cells in many ways, and stem cell aging itself is thought to contribute to tissue aging, especially in tissues where cells renew frequently. Stem cells can be lost during aging, leading to stem cell depletion and a reduced ability to repair organ damage.

8. **Altered intercellular communication and inflammaging:** The cells and organs in our body do not age in isolation, but communicate with each other via hormones, cytokines (small proteins that act as chemical messengers) and metabolic products. Aging involves changes at the level of intercellular communication which further contributes to decline in tissue health. Senescent cells trigger chronic prolonged low-grade inflammation that can further damage aging tissues. With age, the signaling environment of chemical messages across the whole body becomes more inflammatory, causing chronic low level inflammation also known as inflammaging. This weakens the immune system, thereby causing tissue damage, muscle wasting, bone loss and other age-related diseases.
9. **Hormonal Imbalance:** Hormones play a primary role in the aging process. Hormonal imbalance with age causes several age related conditions. As people age they produce less hormones and the number of hormone receptors on cell surfaces decrease. Estrogen decreases as women age, reaching an all-time low during menopause. Reduced levels of estrogen cause fine lines around the forehead, eyes, and mouth. Collagen levels also dip with the decrease in estrogen causing skin to become thinner. In men, low testosterone is associated with wrinkles, muscle loss, thinning hair, and weight gain. Progesterone also decreases the body's reliance on the hormone cortisol, which ages the skin. Thinning hair, dry skin, brittle nails, feeling tired and looking puffy are all results of low thyroid levels. There is also imbalance in the estrogen-progesterone ratio. Low thyroid levels can also make the voice hoarse and affect concentration and memory. Whereas, elevated thyroid levels can result in rapid heartbeat, vision and sleep disturbances, tremors, sudden paralysis, and nervousness.
10. **Dysbiosis:** Over recent years, gut microbiome has gained a lot of attention for its role in various physiological processes such as nutrient digestion and absorption, protection against pathogens, and production of essential metabolites including vitamins, amino acid derivatives, secondary bile acids, and short-chain fatty acids (SCFAs). Therefore, a healthy balance of intestinal microbiota is crucial for overall maintenance of health. Dysbiosis is characterized by an imbalance in this gut microbiota which may eventually contribute to aging and age-related diseases such as obesity, type 2 diabetes, ulcerative colitis, neurological disorders, CVDs, and cancer. The gut-brain axis is a communication system that connects the brain and the gastrointestinal tract, and the composition of the gut microbiota changes with age. These changes can impact brain function and contribute to age-related neurological disorders and other health conditions.

The waste accumulation theory of aging:

The waste accumulation theory of aging suggests that aging occurs because the body

gradually builds up waste products inside cells that it cannot effectively remove. Over time, these waste materials—such as damaged proteins, cellular debris, and other toxic byproducts—accumulate in cells and tissues, interfering with their normal function.

As this buildup increases, it leads to cell damage, tissue dysfunction, and eventually contributes to aging and age-related diseases. For example, in conditions like Alzheimer's disease, protein waste such as amyloid plaques accumulate in the brain, leading to cognitive decline. The theory proposes that the body's decreasing ability to clear out this waste is a key factor in the aging process.

Signs Of Normal Aging

Dynamic changes in biological, physiological, environmental, psychological, behavioral, and social systems are linked to aging. Following are the obvious signs that are experienced with increasing age:

1. Hair: Graying hair and Hair loss,
2. Skin: Sagging, wrinkles, age spots, dry skin, loss of skin tone,
3. Bone: Joint stiffness, Osteoporosis (loss of bone calcium), Spinal discs shrink and lose elasticity
4. Brain: Memory loss, brain fog, slow movements, tremors
5. Eyes: Eyesight deterioration,
6. Senses: Farsightedness, hearing problems, and a decline in the ability to smell and taste
7. Digestive system: Slower digestion, decreased appetite, and a lower ability to absorb nutrients
8. Urinary system: Urinary incontinence
9. Muscles: Loss of muscle fibers and muscular strength,
10. Body fat: Body fat typically doubles by age 75, and the distribution of fat changes
11. Slowing of sexual responsiveness

Summary

Aging is an inevitable part of our natural life cycle which manifests as gradual weakening of both body and mind, often accompanied by various incapacitating symptoms. It begins at the cellular level when the body's own intrinsic powers fail to maintain and repair itself to work efficiently.

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CHAPTER

Two

Characteristics of People Living in the Blue Zones

The concept of Blue Zones refers to regions of the world where people live significantly longer and healthier lives compared to the global average. The work for identification of these areas was born out of the work done by Michel Poulain and Gianni Pes who identified Sardinia, Italy as the region with the highest concentration of male centenarians. Further, in early 2000s, Dan Buettner and his team comprising of Michel Poulain and Gianni Pesin identified other areas including Okinawa (Japan), Sardinia (Italy), Nicoya Peninsula (Costa Rica), Ikaria (Greece), and Loma Linda (California, USA) where they have a higher-than-average number of centenarians largely without chronic diseases. The team established specific lifestyle traits that enhanced the longevity of the people living in the Blue zones of the world. They found that the people living in such regions have 9 specific characteristics and termed them together as Power 9 Principles. The remarkable longevity of individuals living in Blue Zones can be attributed to a combination of dietary habits, physical activity, social connections, purpose in life, stress management, cultural practices, and healthcare access. Following are the 9 traits that are believed to slow down the aging process:

- (i) **Move naturally:** The world's longest-lived people do not pump iron, run marathons, or join gyms. Instead, they live in environments that constantly nudge them into moving without thinking about it. They grow gardens and do not have

mechanical conveniences for house and yard work.

- (ii) **Purpose:** The Okinawans call it “Ikigai” and the Nicoyans call it “plan de vida”; for both, it translates to “why I wake up in the morning.” Knowing your sense of purpose is worth up to 7 years of extra life expectancy.
- (iii) **Downshift:** Even people in the Blue Zones experience stress. What the world’s longest-lived people have that others do not are routines to shed that stress. Okinawans take a few moments each day to remember their ancestors; Adventists pray; Ikarians take a nap; and Sardinians do happy hour.
- (iv) **80% Rule:** “Hara hachi bu” – the Okinawan 2500-year old Confucian mantra said before meals reminds them to stop eating when their stomachs are 80% full. The 20% gap between not being hungry and feeling full could be the difference between losing weight or gaining it. People in the Blue Zones eat their smallest meal in the late afternoon or early evening, and then, they do not eat any more the rest of the day.
- (v) **Plant slant:** Beans, including fava, black, soy, and lentils, are the cornerstone of most centenarian diets. Meat – mostly pork – is eaten on average only 5 times per month. Serving sizes are 3 to 4 oz, about the size of a deck of cards.
- (vi) **Wine @ 5:** People in all Blue Zones (except Adventists) drink alcohol moderately and regularly. Moderate drinkers outlive nondrinkers. The trick is to drink 1 to 2 glasses per day (preferably Sardinian Cannonau wine), with friends and/or with food. And no, you cannot save up all week and have 14 drinks on Saturday.
- (vii) **Belong:** Research shows that attending faith-based services 4 times per month will add 4 to 14 years of life expectancy.
- (viii) **Loved ones first:** Successful centenarians in the Blue Zones put their families first. This means keeping aging parents and grandparents nearby or in the home. They commit to a life partner (which can add up to 3 years of life expectancy) and invest in their children with time and love.
- (ix) **Right tribe:** The world’s longest lived people chose – or were born into – social circles that supported healthy behaviors, Okinawans created “moais” – groups of 5 friends that committed to each other for life. Research from the Framingham Studies shows that smoking, obesity, happiness, and even loneliness are contagious. So the social networks of long-lived people have favorably shaped their health behaviors.

By incorporating these characteristics in daily living, one can not only have a longer lifespan but also a better quality of life regardless of their geographical location.

Summary

Blue Zones are regions where people live longer and healthier lives as compared to the rest of the world. The remarkable longevity in these zones is attributed to 9 Principles, which include natural movement, a sense of purpose, stress reduction, plant-based diets, moderate wine consumption, strong social connections, and prioritizing family. By adopting these practices, individuals can improve both lifespan and quality of life.

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CHAPTER

Three

Biomarkers of Aging

As we have understood from the previous chapters, aging is a complex phenomenon that ultimately affects the cell and tissue functions of our body. With increasing age, physically and mentally healthy adults gradually become less fit and more vulnerable to illness and death. It is the most profound risk factor for almost all non-communicable diseases including cancer, diabetes, cardiovascular diseases and neurological diseases. However, these changes happen at different rates in different people. Advances in science have led to understanding the mechanisms that are involved in the process of aging which eventually lead to age related disease manifestation.

To prevent the age-related disease manifestation, it remains important to find accurate predictors of the onset of ill health and distinguish between normal biological aging and when health is compromised. It is also important to characterize the parameters responsible for maintenance of age-appropriate optimal health. Currently, there is no gold standard to assess healthy aging. However, there are some biomarkers that can be assessed to study survival, health at old age, frailty, age-related morbidity or disability.

A biomarker of aging is a biological parameter that predicts the biological age of an individual which is a measure of how old the cells and tissues of the body are. This differs from the chronological age which is the number of years that an individual is alive and is calculated from birth. Different individuals of the same chronological

age may experience varying rates of aging. Biological age serves as an indicator of whether individuals are undergoing accelerated aging or following a normal aging trajectory. Most biomarkers have been developed assuming that an individual's biological age is aligned with the chronological age from the reference point of healthy individuals. They can also be used to test whether any treatment, lifestyle modifications or diet alterations slowed down the aging process.

Numerous biomarkers of aging have been studied ranging from molecular changes and imaging characteristics to clinical features. Identification of a reliable biomarker is extremely important for accurate risk categorization of individuals and to explore anti-ageing interventions.

Biomarkers of aging can be broadly classified into

- (a) Cellular and Molecular Biomarkers:** which include telomeres, OMICS biomarkers which measure biological molecules and systems of the body (e.g.DNA, proteins, metabolites, etc), blood based biomarkers and Biophysical biomarkers
- (b) Image-Based Ageing Biomarkers:** which includes Brain imaging using MRI, retinal imaging, electrocardiogram (ECG), face age, etc
- (c) Clinical Measure-Based Ageing Biomarkers:** which includes lung age, cognitive age, heart age. These can be assessed through clinical tests, measurements of vital signs, physical examinations and clinical scales.
- (d) Physiological Biomarkers:** includes functional performance (e.g., cardiorespiratory fitness, VO2 max, gait speed, timed walking distance, grip strength, or cognitive function) or physical characteristics (e.g., body-mass index or weight-height ratio).

Some commonly used biomarkers to test aging have been described in detail below.:

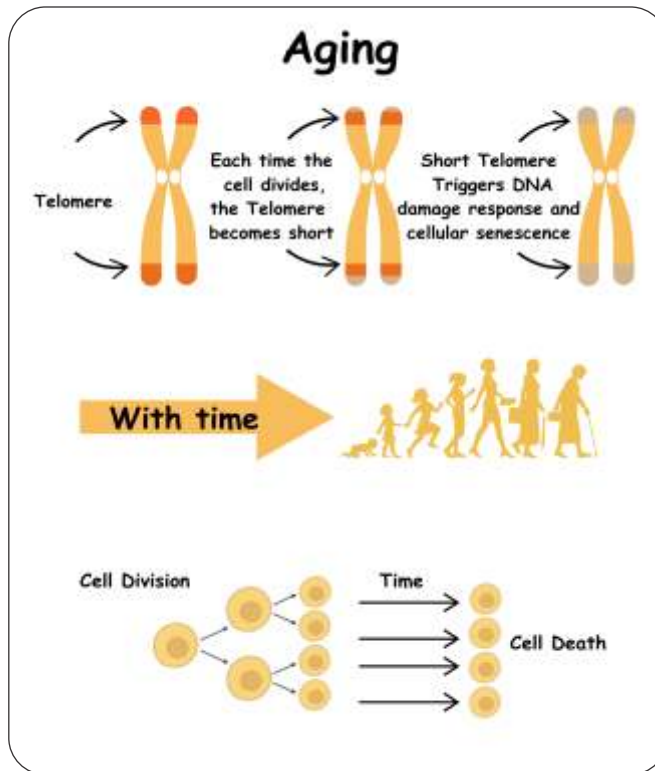
Telomere length:

Telomeres are regions of repetitive nucleotide sequences at the ends of chromosomes which can protect DNA from damage and instability. Telomeres shorten after every cell cycle. Telomere length is considered as a marker of aging because most human somatic cells will undergo a limited number of divisions until the protective function of telomeres is exhausted, leaving cells vulnerable to mutations and death. Previous studies found telomere length shortened predictably with age, and this process occurred in most cells and tissues. Telomere shortening is significantly associated with functional decline of most organs with age.

Accelerated rate of telomere shortening is also a commonly associated feature of age-related diseases. For these reasons, telomere length (TL) has been recognised for a long time as one of the best biomarkers of aging.

2. Blood based aging biomarkers

Blood draws are part of routine examinations which test the quantitative and



morphological changes in blood cells, including red blood cells, white blood cells, and platelets. Analysis of blood biochemistry provides the biological characteristics to estimate the function of organs. These are commonly used and are economical for tracking overall health in clinical settings. Studies exploring the influence of age on peripheral blood parameters have detected changes in blood cell counts with aging. With advancing age, routine blood tests exhibited decreased levels of hemoglobin levels, white blood cell, and platelet count, while blood biochemistry revealed impaired physiological function as indicated by decreased glomerular filtration rate and elevated creatinine levels. Liver enzymes such as alanine aminotransferase (ALT), aspartate aminotransferase (AST), and γ -glutamyl transferase (GGT) also showed age-dependent changes both in men and women.

Most older individuals have numerous elevated proinflammatory markers (termed the senescence-associated secretory phenotype or SASP) like C-reactive protein (CRP), interleukin 6 (IL-6), interferon α and interferon β , transforming growth factor- β (TGF- β), and serum chemokines MCP-1. These molecules may help detect onset of age-related pathologies.

Summary

Biomarkers of aging are biological indicators that measure the biological/cellular age of an individual. These biomarkers help assess aging, track health, and evaluate the effect of therapies on slowing down the aging process. Some biomarkers include telomere length, blood-based markers, imaging based markers and physiological indicators.

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CHAPTER

Four

Need For Anti-Aging Treatments

Historically, the pursuit of eternal life has always been a driving force behind scientific research, folklore and cultural stories. While it is beyond human capacity to achieve immortality, the field of medicine has made significant progress in understanding the science behind aging and how to achieve longevity.

Interestingly, a Danish study established that genetics only accounts for 20–30% of longevity whereas the other 80% is dictated by environmental influences, including diet and lifestyle. In today's urban world, age-related chronic diseases are becoming more common. While genetics somewhat determine the lifespan and susceptibility to these diseases, lifestyle probably has a greater impact.

In the previous chapter, we discussed the distinct characteristics of the people from the Blue Zones of the world. However, with the majority of the world's population living in cities, it can get difficult for them to achieve most of these characteristics. Therefore, developing treatments that can help them achieve not only a long life but a healthy life is the need of the hour. Also as global aging is accelerating and people's quality of life is improving daily, the desire to be healthy and young has become a common goal. Developing a reasonable solution to the social pressure brought about by aging is also a problem that needs to be addressed.

How can people living in Urban areas reverse aging or experience a long life ?

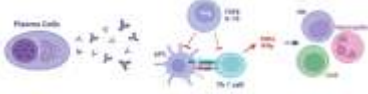
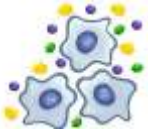
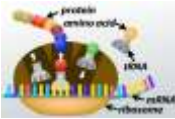
Anti-Aging Treatments are important strategies focused on possible interventions to improve lifestyle in order to increase the chance to attain longevity by modulating the basic molecular mechanisms of aging. They mitigate the factors that accelerate the aging process, promoting a shift from unhealthy to balanced lifestyles. The ultimate goal of Anti Aging treatment is to reduce age-related diseases and increase the likelihood of a longer, healthier lifespan, enabling individuals to enjoy additional years as healthy and vital human beings. Modern medicine offers the potential to slow down and even reverse the cellular changes associated with aging. This not only extends longevity but also enhances the quality of life. At the same time, these treatments decreases the risk of occurrence of age-related diseases.

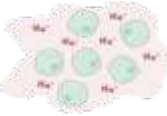
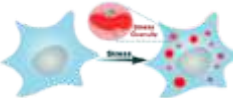
The main principles of anti-aging treatments are:

- Reduce inflammation
- Increase oxygenation
- Increase blood flow
- Enrich body with optimum doses of vitamins and antioxidants to fight oxidative stress
- Maintain gut health
- Remove toxins
- Improve physical endurance and stamina
- Enhance tissue repair and immunity
- Balance hormones
- Ease physical and mental stress

Treatments such as Hyperbaric Oxygen therapy and Ozone therapy help improve tissue oxygenation throughout the body, which leads to enhanced tissue healing and rejuvenation. HydroColon therapy can help remove toxins from the gut, which leads to improvement in intestinal functions and contributes to improving immunity and enhancing overall health. Treatments like Micronutrient therapy can help the body to gain vital nutrients. Naturopathy uses natural remedies to heal the body, it is a combination of different therapies like yoga, meditation, acupuncture, exercise, massage, shirodhara and infrared sauna. For those leading sedentary lifestyles, the aging process can accelerate. As the saying goes, "prevention is better than cure," and this is precisely where rehabilitation plays a pivotal role in maintaining the human body's well-being. Cryotherapy helps in weight management. Several cosmetic techniques and aesthetic medicine are used to enhance skin and hair health and reverse aging.



↑		↓
	Mitochondrial Dysfunction	
↑		↓
	Cellular hypoperfusion	
↑		↓
	Immune dysfunction	
↑		↓
	Cellular senescence	
Increased ↑		Decreased ↓
	Genomic instability	
Decreased ↓		Increased ↑
	Protein synthesis	
Dysregulation		Regulation
	Cell metabolism	
Decreased ↓		Increased ↑
	Telomere	
Decreased ↓		Increased ↑
	Endogenous stem cell	

Imbalanced	 Cell homeostasis	Balanced
Impaired	 Cell signaling	Improved
Damage	 Epigenetic	Repair
Dysregulation	 Nuclear sensing	Regulation

Summary

The need for anti-aging treatments arises from the increasing prevalence of age-related chronic diseases and the desire for a longer, healthier life. These treatments aim to combat inflammation, improve oxygenation, promote detoxification, balance hormones, and enhance physical and mental health, using therapies like hyperbaric oxygen, ozone therapy, micronutrient supplementation, gut cleansing, naturopathy, etc. Ultimately, anti-aging interventions seek to extend both lifespan and healthspan, enabling individuals to enjoy healthy and youthful lives.

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SECTION B

Anti-Aging Therapies



CHAPTER

Five

Hyperbaric Oxygen Therapy

What is Hyperbaric Oxygen Therapy?

Hyperbaric Oxygen Therapy (HBOT) is a safe and noninvasive procedure involving administration of pure 100% oxygen under pressure that is higher than atmospheric pressure.

It involves sitting or lying in a special enclosed, transparent chamber known as hyperbaric chamber and breathing oxygen as the pressure inside the chamber is increased gradually. The procedure takes approximately 60 minutes.

There are different types of hyperbaric chambers:

1. Monoplace hyperbaric chambers which can accommodate one person.
2. Multiplace chambers are larger and can accommodate two or more people at the same time. In a multiplace chamber, patients breathe oxygen through a mask or a hood.

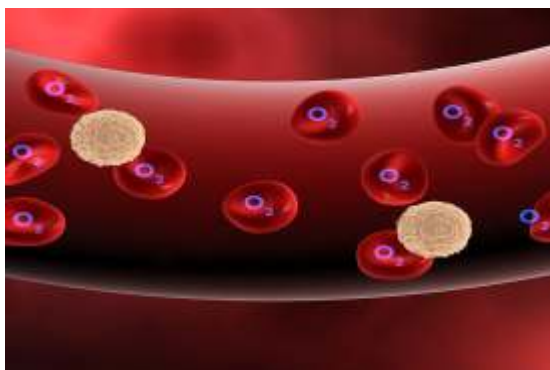
How does Hyperbaric Oxygen Therapy work?

Oxygen is key for functioning of all human cells. It is introduced in our body through the air that we breathe and through the lungs gets delivered to the bloodstream. The oxygen in the blood then travels to every organ of the body.

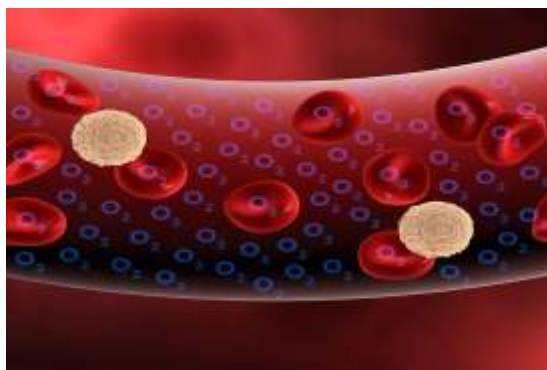
If there is a lack of oxygen in the tissue it may cause hypoxia thereby affecting the normal functioning of the organs. Low blood supply (ischaemia) or difficulties in the oxygen delivery, may also be responsible for tissue hypoxia.

HBOT provides 100% oxygen which significantly improves tissue oxygenation throughout the body, leading to enhanced tissue healing and rejuvenation.

At normal atmospheric pressure, the oxygen we breathe is primarily transported by hemoglobin in red blood cells (RBCs). However, at high atmospheric pressure or under conditions of increased atmospheric pressure like hyperbaric oxygen therapy, inhaling 100% oxygen allows a greater amount of oxygen to dissolve directly into the plasma and is carried by the entire blood. Under these conditions along with RBCs, oxygen is also carried by other blood parameters and plasma. This enhanced oxygen saturation ensures more efficient delivery to tissues throughout the body, complementing the oxygen carried by hemoglobin and optimizing overall oxygen availability for cellular functions.



At normal atmospheric pressure ,
Oxygen is carried by hemoglobin (Hb)
in red blood cells (RBCs)



At high atmospheric pressure,
Oxygen is dissolved in the plasma.

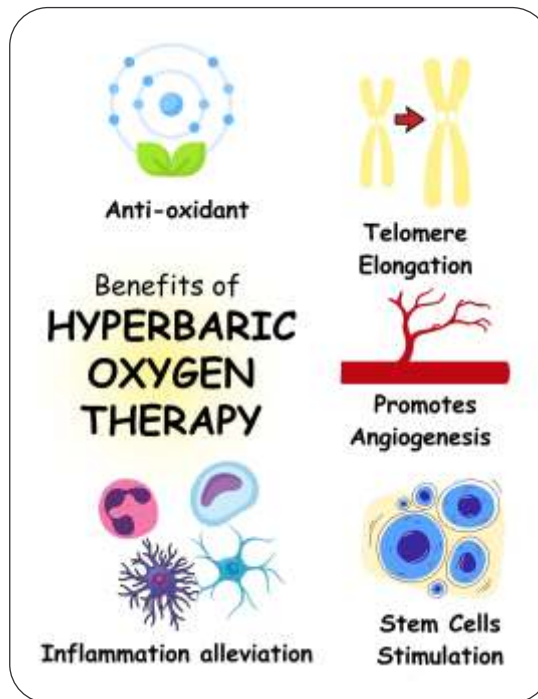
Role of Hyperbaric Oxygen Therapy in aging.

Aging can cause a number of changes that lead to reduced oxygen levels in the body. These changes include:

1. Lung tissue changes: With aging, muscles and tissues of the lung lose their ability to keep the airways open and air sacs also lose their shape. Therefore, air might get trapped in the lungs not allowing enough oxygen to reach the bloodstream making breathing difficult.
2. Changes in bones and muscles of the chest and spine: The bones of the ribcage might become thinner and change shape not allowing proper expansion and contraction during breathing. Muscles of the diaphragm that supports breathing may also weaken, thereby affecting the breathing.

3. Blood flow may also reduce thereby not allowing enough oxygen to reach the tissues and organs to function optimally.

HBOT drives high concentrations of oxygen deep into the tissues thereby improving oxygenation in the body. This offers a multitude of benefits, such as improving immune function which enhances the body's ability to combat infections, including those caused by viral or bacterial agents, promote collagen formation, accelerating wound healing, enhancing neuroplasticity, and even mitigating symptoms of depression and anxiety by triggering the release of the body's natural "feel-good" chemicals like dopamine and serotonin.



Mechanisms by which HBOT promotes healthy aging are:

- It enhances angiogenesis that is formation of new blood vessels further increasing oxygenation throughout the body
- It reduces inflammation
- It enhances antioxidant defenses by modulating the balance between free radicals and scavengers.
- It inhibits cell death.
- It increases the number of circulating stem cells promoting regeneration of new cells.
- It delivers oxygen to the deepest layers of the skin helping cells to repair and
- Improves mitochondrial function and helps to produce more energy.

- Hyperbaric oxygen therapy (HBOT) has also shown to significantly increase telomere length in immune cells indicating potential benefits for cellular aging. This enhancement in telomere length may contribute to improved immune function and overall health in aging populations.

In November 2020 Hachmo et al published a study showing benefits of HBOT in 35 healthy adults aged 64 and older. This study reported a significant increase in telomere length across various immune cells, particularly in B cells, post HBOT. Additionally, there was a marked reduction in senescent cells after treatment. Their study suggested that HBOT may have senolytic effects, promoting healthier aging by enhancing telomere length and reducing cellular senescence.

How is the HBOT procedure done in KLS?



Hyperbaric oxygen is a closed chamber although the half of the chamber is made up of resilient glass. Prior to treatment, we conduct a thorough consultation to rule out contraindication for the treatment and tailor the session to each patient's needs. Before every session, we check vitals like blood pressure, pulse, temperature to ensure safety and well-being.

The patient is made to wear pure cotton scrubs for the session. The patient is made to lie on the hyperbaric stretcher which can be even reclined depending on the patient's comfort. During the session, patients can watch their favorite movie or television series on a screen above the chamber, listen to music, or simply relax and doze off.

As the atmospheric pressure inside the chamber increases, patients may feel a sensation of

fullness or pressure in their ears, similar to what one might experience during a flight or in a high-rise elevator. This is easily alleviated by swallowing, which helps equalize the pressure. Initially, patients might notice a slight warming sensation, but as the pressure stabilizes, they will quickly acclimate and feel more at ease.

Treatment Protocol:

On Day 1, the treatment begins with a therapeutic duration of 30 minutes at 1.3 ATA. The pressure is gradually increased each day until it reaches 1.8 ATA, where it is maintained for 60 minutes for the remaining sessions.

Our 1-week Anti-Aging Program includes a total of 10 hyperbaric oxygen therapy sessions. While this program offers significant benefits, 40 sessions are ideal for maximizing the therapeutic effects for each individual, which can be incorporated in our 2 nd program - 40 days Anti-Aging Program.

Contraindications for HBOT?

Ear surgeries or ear infection

- Uncontrolled and active seizures (daily / weekly / monthly) with or without medicine
- Adenoids/ Enlarged tonsils
- High fever
- Upper respiratory tract infection- cough and cold
- Metal implants outside the body
- Surgery of Chest / Lungs
- COPD/ Asthma
- Blood disorders like congenital spherocytosis
- Any pacemaker
- Epidural implants/ Epidural pain pumps
- Untreated Pneumothorax

What are the side effects?

Usually there are no major side effects of HBOT if done by experts with proper precautions. Some minor temporary side effects may include ear fullness, fatigue and lightheadedness. Very rarely if proper precautions are not taken then serious complications can occur which may include damage to the lungs, buildup of fluid or rupture of the middle ear, damage to the sinuses, myopia, oxygen toxicity or seizures.

Precautions before procedure

- Oxygen is not flammable by itself; however, it accelerates combustion. Thus, the chamber and whatever/whoever that goes into the chamber must be free from combustible materials such as oil, grease, alcohol or petroleum-based products, electrical appliances, or materials capable of creating static electricity. Oil-based cosmetics, deodorants, creams, vaseline and any type of hair spray should not be used. Combustible materials such as paper, magazines, and excess bedding (lint and dust are a fire hazard) should not be used.
- 100% cotton clothing should be worn inside the chamber.
- Electrical appliances in the chamber, except ECG, EEG and thermocouples should not be used
- Chemical warming devices (hand warmers), sparking toys, battery operated devices, and cigarette lighters or matches, etc., should not be used in the chamber.
- Unapproved ear plugs, hard or impermeable contact lenses, or dentures should not be used inside the chamber. Permeable contact lenses ('soft' lenses) may be worn.
- To avoid hypoglycemia have food ½ hr before HBOT

Summary

Hyperbaric Oxygen Therapy (HBOT) is a safe and noninvasive procedure which involves administration of pure 100% oxygen under pressure that is higher than atmospheric pressure. Under high pressure, greater amount of oxygen dissolves directly into the plasma and is carried more efficiently to the tissues throughout the body. It has anti-oxidant and anti-inflammatory properties. It promotes angiogenesis, stimulates stem cell circulation, improves mitochondrial function and inhibits cell death.

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CHAPTER

Six

Ozone Therapy

What is Ozone therapy?

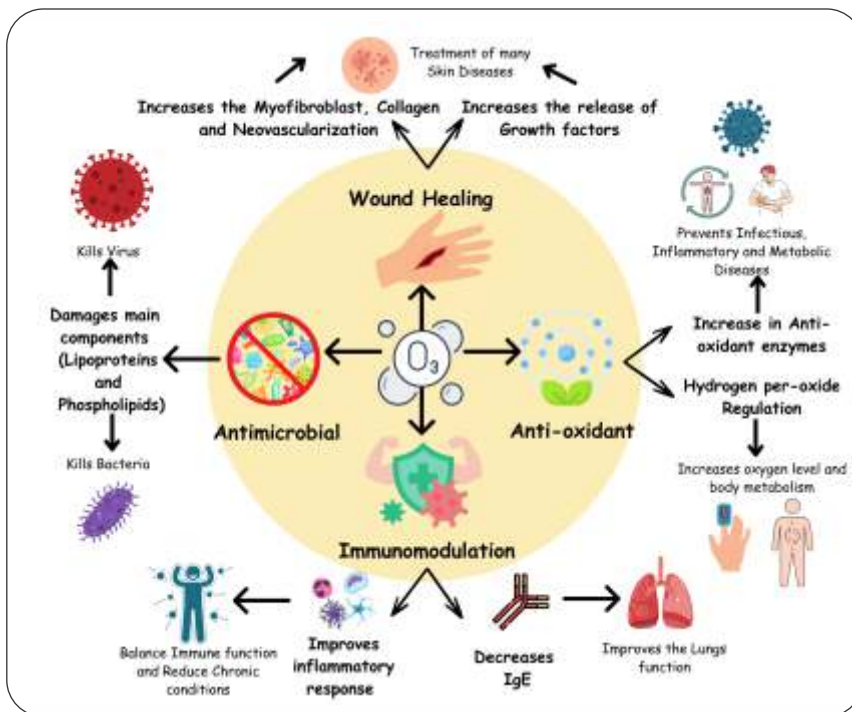
Ozone therapy is a safe, non-invasive treatment which has been used extensively for many years in several medical conditions. It harnesses the power of pure 100% medical grade oxygen-ozone blend to deliver an increased supply of oxygen at the cellular level.

Ozone (O₃) is a versatile and potent gas. It is the strongest naturally occurring oxidant. It is produced in nature when the ultraviolet sunlight breaks apart an oxygen molecule to form two separate oxygen atoms. Each atom then binds with another oxygen molecule to form an ozone molecule.

Medical grade ozone is a mixture of medical-grade oxygen and ozone (95% O₂: 5% O₃) that's used in ozone therapy to treat a variety of conditions. It plays a crucial role in fortifying the body's defenses against infections while enhancing cellular respiration. It was first used topically on the battlefields of World War I for disinfection and to treat gangrene in the wounded during the war and the doctors found out that ozone not only treated the infection but also had a systemic, anti-microbial and anti-inflammatory effect.

How does ozone therapy work?

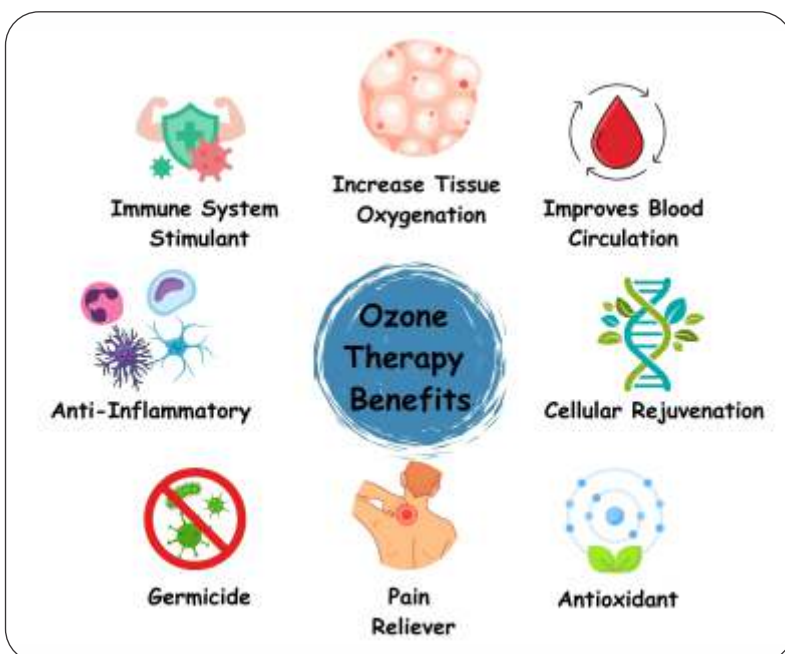
Ozone therapy primarily stimulates the body's antioxidant response, thereby augmenting



immune system functionality. This therapy also elevates tissue oxygenation at the cellular level, bolstering the blood's capacity to carry oxygen, which, in turn, enhances cellular metabolism and tissue function. This comprehensive approach alleviates hypoxia, reducing inflammation and facilitating the repair of damaged organs, both in the short and long term. Ozone therapy exhibits notable anti-inflammatory and anticoagulant properties, enhancing blood flow to hypoxic tissues within the body.

Furthermore, ozone demonstrates exceptional germicidal properties, making it effective against a spectrum of pathogens, including viruses, bacteria, fungi, and parasites. Ozone inhibits the tumor metabolism and destroys them using cell lysis and helps in activation of the immune system.

It is used to treat various bacterial, viral and allergic conditions. It is also used to manage exhaustion, nervous tension and pain.



What is the role of ozone therapy in anti-aging?

1. It improves overall cellular function by improving oxygenation to all tissues and organs of the body and helps maintain health and efficiency of various body systems, contributing to better health and increased longevity.
2. It modulates the immune system, reducing chronic inflammation often associated with aging.
3. It imparts anti-oxidant properties, reduces oxidative stress and protects cells from damage, preserving their vitality and reducing signs of aging.
4. Mitochondrial dysfunction is one of the main features of the aging process particularly in organs requiring a high-energy source such as the heart, muscles, brain, or liver. Ozone stimulates the energy production in the mitochondria.
5. It promotes a balanced gut microbiome, enhancing digestion and nutrient absorption while facilitating the elimination of harmful toxins. This detoxification process supports overall gut health, which is vital for maintaining youthful energy and vitality.
6. By increasing oxygen levels in the liver, ozone therapy improves the organ's ability to metabolize and eliminate toxins efficiently. This enhanced detoxification supports optimal liver function, which is essential for maintaining metabolic health and preventing age-related decline.
7. It enhances cerebral oxygenation and reduces oxidative stress, which can help improve cognitive performance and memory. By promoting neuroprotection, it supports brain health, helping to mitigate age-related cognitive decline.
8. Medical ozone therapy has been shown to reduce pain by enhancing oxygen delivery to tissues, which promotes healing and decreases inflammation. Additionally, its analgesic properties can help alleviate chronic pain conditions, improving overall mobility and quality of life.
9. It accelerates tissue regeneration by improving blood circulation and reducing inflammation, which aids in quicker recovery from injuries. This enhanced healing capacity not only rejuvenates the skin but also helps maintain its integrity as we age.
10. Ozone therapy enhances the skin's appearance by improving oxygen delivery to skin cells, which is crucial for maintaining a vibrant, youthful glow. Enhanced oxygenation ensures that skin cells function optimally, contributing to a healthier and more radiant complexion.
11. Collagen is vital for maintaining skin elasticity and structure. Ozone therapy stimulates collagen production by enhancing the release of growth factors and cytokines critical for tissue regeneration. This can improve skin tone and texture,

making it firmer and reducing wrinkles.

How is ozone therapy done at KLS?

At KLS Wellness Institute, ozone therapy is administered by trained medical practitioners through various external and internal methods to provide systemic and localized health benefits. Each patient undergoes a detailed consultation to determine the right dose, frequency, and course of treatment based on individual needs.



At KLS Wellness Institute, ozone therapy is administered through two main routes: external and internal.

External Ozone Therapy Methods:

1. **Sauna:** A method that combines ozone with steam sauna therapy for systemic benefits. This treatment is done for 15 to 20 minutes.
2. **Ozone water:** Medical Ozone is bubbled for 20 minutes in drinking water and given to the individual in 1 liter of glass bottle to improve gut health. The patient has to drink the entire bottle at regular interval the entire day.
3. **Ozonated Oil:** Medical ozone is infused in oil having dense viscosity at various concentrations to get anti-inflammatory or germicidal effect.
4. **Ozone Funneling or bagging:** This is indicated in cases of skin injury, non-healing ulcers or wounds, etc. A funnel or an ozone resistant bag is first placed on the treatment area. The medical ozone is then infused through a silicon tube in the funnel or the bag for a certain period of time approximately 15 minutes depending on the results the clinician wants to obtain. It works as germicidal, and has anti-inflammatory effects.
5. **Ozone cupping -** This method of application helps in improving blood circulation to the area where it is used and also improves the tone of muscles and skin over the area used. It is widely used for cosmetic purposes.

Internal Ozone Therapy Methods:

1. **Rectal Route:** A safe and systemic administration method suitable for individuals of all ages. It promotes cellular oxygenation, improves immunity, reduces inflammation and pain from the body, reduces pathogen load from the gut, improves metabolism and promotes overall wellbeing.
2. In this method, medical ozone is infused in the rectum through a silicon rectal tube after collecting a specific amount at a particular concentration of ozone in an ozone

resistant bag. It promotes cellular oxygenation, improves immunity, reduces inflammation and pain from the body, reduces pathogen load from the gut, improves metabolism and promotes overall wellbeing.

3. **Ear Route:** This method of medical ozone application is beneficial for addressing conditions related to the brain, eyes, and ears and safely effective for all age groups. The medical ozone gas is passed through a stethoscope where the earpiece is placed in the ears of the patient and chest piece is modified and used as a connector to pass ozone gas from the ozonator machine to the stethoscope.
4. **Breathing Ozone Through Oil (BOTO):** This method of medical ozone applications is effective for relieving symptoms related to the entire respiratory passage, including the nose, sinuses, throat, and lungs. The medical ozone is bubbled at a particular concentration and flow in the oil with high density (eg- sesame oil) and the fumes(polyunsaturated fatty acid) produced from the oil is inhaled by the patient through the nasal cannula. This application of ozone also helps in improving lung capacity.
5. **Vaginal Insufflation –** This method of medical ozone application is effective for various female related issues. It improves hormonal balance and helps to normalize monthly cycles. The Medical ozone is infused through vagina through a tube attached to the ozonator.
6. **Intravenous (IV) Saline:** This method of medical ozone is a systemic administration that provides an instant energy boost and possesses powerful germicidal effects, making it effective against systemic infections. Here, Medical ozone is bubbled in normal saline at particular concentration for 20 minutes and administered intravenously to the patient under aseptic precaution.
7. **Intramuscular:** This method of medical ozone applications is used to alleviate generalized body aches and also serves to provide anti-inflammatory and pain relief when given around the joints or capsules i.e paraspinal, periarticular, etc. In this medical ozone application a small quantity of medical ozone is collected in a BD syringe and injected at the localized pain area under aseptic precautions.
8. **Autohemotherapy –** This method of medical ozone is a systemic administration of ozone that provides an instant energy boost and is beneficial for immune boosting, detoxification, acceleration of wound healing, reduction of pathogenic load (viral bacterial, fungal, parasitic) from the system, etc. This method of application is an advanced method of ozone application and it is administered only after a few sessions of non-invasive ozone is administered.
9. **Prolozone therapy-** This is a non-surgical alternative for treating musculoskeletal and joint pain. It involves injecting a mixture of ozone gas and other substances, such as cortisone, directly into affected joints. This therapy enhances blood flow, reduces inflammation, and stimulates tissue regeneration, potentially regenerating cartilage and alleviating pain.

Prolozone is effective for conditions like degenerative spinal discs, chronic back pain,

rotator cuff injuries, shoulder and elbow joint pain, and arthritis or any of the hips and knees. It may also boost the body's antioxidants, supporting recovery from various health issues, including anti-aging effects and improved skin appearance. This procedure has to be in a completely sterile environment under aseptic precautions preferable a fumigated operation theater by a trained doctor only.

It is worth noting that none of these ozone therapy administration routes are painful or discomforting. Minimum of 10 sessions are required to get the desired result except for prolozone. At KLS wellness institute we give 20 sessions of non-invasive ozone session in Anti aging 2 weeks and 3 months program.

Contraindications to Medical ozone:

- G6PD deficiency,
- Hyper thyroid state,
- Thrombocytopenia, (deficiency of platelets in the blood)
- Bleeding disorders and during active menstrual days
- Acute hypoglycemic state.
- Ear insufflations are contraindicated in cases of Seizures, ear surgeries/implants, ear infections (ASOM).

Safety measures to be taken for Ozone therapy?

Safety measures to be taken:

- Check BP before ozone administration.
- Check blood sugar levels before ozone administration
- G6PD levels should be in the normal range.
- Check if hemoglobin and platelets are within acceptable ranges (hb above 10g/dl and platelets above 1.5 lac/mic l)
- Take probiotics after rectal ozone.

Are there any side effects of ozone therapy?

Ozone therapy when administered correctly is safe and does not have any major side effects. Minor side effects of ozone therapy include transient nausea, puckish feeling while taking ear ozone which is temporary, temporary headaches, bleeding from any orifices (only if there is any bleeding disorder, active bleeding), increased frequency of stools and hypoglycemia. If ozone is directly inhaled it can cause severe irritation to the eyes and respiratory passages and lungs further triggering asthma, choking, or shortness of breath. If ozone is accidentally inhaled then take vitamin C tablets.

Summary

Ozone therapy is a safe, non-invasive treatment which uses medical grade ozone to deliver an increased supply of oxygen to all the tissues of the body. It has anti-oxidant, anti-inflammatory, germicidal properties. It enhances cellular metabolism, blood flow to hypoxic tissues, and tissue function.

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CHAPTER

Seven

Hormone Therapy

What is hormone therapy?

Hormones are natural chemicals produced by the endocrine system of our body. They control the functions of all organs. However, if there is imbalance in the levels of hormones, it eventually affects the functioning of the target organs.

Hormone therapy helps maintain the hormonal balance in the body by supplementing the hormones whose production is reduced by aging. The hormones are introduced gradually to increase and balance hormone levels over time.

How does hormone therapy work?

Hormones are crucial in our bodily function and mechanism of action of them are as follows

1. **DHEA (Dehydroepiandrosterone):** DHEA serves as a precursor hormone for both testosterone and estrogen, supporting hormonal balance and promoting cellular regeneration. Its role in enhancing energy levels and mood can mitigate the effects of aging and improve overall mental well-being.
2. **Cortisol:** As the primary stress hormone, cortisol regulates metabolism and immune

response; however, chronic elevation can lead to cellular aging and stress-related disorders. Managing cortisol levels through lifestyle changes can enhance mental health and reduce the negative impacts of stress on the body.

3. **Estrogen:** Estrogen plays a vital role in women's health, particularly during menopause, by regulating mood, cognitive function, and maintaining skin elasticity. Its antioxidant properties also help protect cells from aging, contributing to overall health and mental clarity.
4. **Progesterone:** Known for its calming effects, progesterone helps regulate mood and sleep patterns, providing a sense of relaxation and well-being. Its role in counteracting estrogen's effects also supports hormonal balance during menopause.
5. **Testosterone:** This hormone is crucial for muscle maintenance, bone density, and overall vitality in both men and women. In the context of andropause, testosterone helps combat fatigue and improve mood, promoting a sense of well-being and vitality.
6. **Melatonin:** Melatonin regulates the sleep-wake cycle and has powerful antioxidant properties, protecting cells from oxidative stress. By improving sleep quality and duration, it enhances mental well-being and supports overall cellular health, which is crucial for anti-aging.
7. **Insulin:** Insulin is a vital hormone produced by the pancreas that plays a crucial role in regulating blood sugar levels and overall metabolism. It ensures that glucose is effectively utilized and stored, preventing excessive blood sugar levels and maintaining metabolic balance. Any abnormality associated with insulin production results in diabetes or metabolic disorders.
8. **Thyroid hormone:** Thyroid hormones play a crucial role in regulating various physiological processes in the body such as metabolism, growth, development, and cardiovascular functions. The primary thyroid hormones are thyroxine (T4) and triiodothyronine (T3), which are produced by the thyroid gland located in the neck. Dysregulation of thyroid hormone levels can lead to various health issues, including hypothyroidism (low thyroid hormone levels) and hyperthyroidism (excessive thyroid hormone levels), both of which can have significant impacts on overall health and well-being.

Hormone therapy can be administered via different routes such as:

- Oral Medication
- Through topical application of creams, gels or spray
- Implanting pellets subcutaneously
- Vaginal applications in the form of creams, rings or tablets
- Through intravenous injections

What is the role of hormone therapy in aging?

As we age, our body produces decreased levels of some hormones. These decreased

hormone levels coincide with various aging signs and symptoms. Hormones that have a noticeable impact on our body during the aging process include

- Testosterone
- Estrogen
- Progesterone
- Growth Hormone
- Dehydroepiandrosterone (DHEA)
- Cortisol
- Melatonin

These hormones fluctuate as we age and have widespread effects on energy levels, body composition, sex drive, skin, hair and nail health. The reduction in hormone production that commonly occurs with age can also influence a variety of metabolic processes thereby increasing risk of obesity, cardiovascular diseases, hypertension, diabetes, dementia

Hormone therapy introduces these hormones gradually in the body so the hormone levels increase and achieve balance over time. As this treatment balances the hormone levels, it counteracts many aging signs that occur with age .

After hormone therapy, improvements are usually noticed in the following areas

- Skin and hair health,
- Muscle mass,
- Bone health
- Sexual health
- Symptoms associated with menopause: skin dryness, Fewer hot flashes and night sweats.



- Stronger memory and focus.
- Confidence,
- Mood stability.
- More restful sleep.
- Improved weight management.
- Greater interest in activities and hobbies.

- Overall energy.

How is hormone therapy done at KLS?

At KLS Wellness, we take a comprehensive approach to hormone replacement therapy (HRT) to help our patients achieve optimal health and well-being. The process begins with a detailed consultation, during which we assess individual health goals and rule out any contraindications.

Step 1) Comprehensive Consultation

During the initial consultation, our healthcare professionals will discuss your symptoms, medical history, and health goals. This thorough assessment ensures we create a personalized treatment plan tailored to your unique needs.

Step 2) Hormonal Profile

We recommend a series of serum hormone tests to evaluate your hormonal status. These tests may include:

1. **Thyroid Profile:** Testing for Thyroid-Stimulating Hormone (TSH), Free Triiodothyronine (FT3), and Free Thyroxine (FT4) to assess thyroid function.
2. **Cortisol Levels:** Measuring cortisol to understand how stress may be affecting your hormone balance.
3. **DHEA-S:** Evaluating Dehydroepiandrosterone sulfate, a crucial hormone for vitality.
4. **Female Hormones:** Testing levels of Progesterone, Estradiol, and Prolactin, particularly for women experiencing pre-menopausal symptoms or those who have undergone oophorectomy.
5. **Male Hormones:** Assessing Testosterone and Prostate-Specific Antigen (PSA) to address issues such as sexual dysfunction and erectile dysfunction.

Step 3: Prescription

Based on the test results, our team will develop a customized hormone supplementation plan which includes either Oral Hormone supplement or topical applications like creams or gel directly in the skin. If the person is suffering from disturbances in sleep cycle, melatonin is added in the prescription.

Side effects

Using any type of hormone therapy is a decision made between the healthcare provider and the individual after carefully considering the risks and benefits of the treatment. The decision is accepted if benefits of hormone therapy outweigh the risks. Studies have shown that the risks of serious side effects from this treatment are very low. Risks of the treatment depend on the type of therapy one takes, how long it is taken for and an individual's own health risks.

Summary

Hormones are natural chemicals produced by our body which controls the functions of all organs. Hormone therapy helps maintain the hormonal balance in the body by supplementing the hormones whose production is reduced by aging. The hormones are introduced gradually to increase and balance hormone levels over time.

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CHAPTER *Eight*

Micronutrient Therapy

What is micronutrient therapy?

Micronutrient therapy is a treatment involving administration of essential vitamins and minerals in high concentrations either orally or intravenously to replenish the body with the ideal balance of the vital nutrients.

Micronutrients are vitamins and minerals that serve as the fundamental building blocks for our body. They are required in small amounts but play a crucial role in metabolism and maintenance of tissue function. An adequate intake therefore is necessary since their deficiency can cause severe and even life-threatening conditions. Micronutrient deficiency may also affect the immune system making individuals susceptible to infections. It can also affect energy levels, mental clarity and overall capacity of the deficient individual which further leads to reduced educational outcomes, reduced work productivity and increased risk from other diseases and health conditions. Deficiencies in iron, vitamin A, Vitamin D, Vitamin B12 and iodine are the most common around the world.

There has been a growing interest in the role of micronutrients in optimizing health and in prevention or treatment of diseases.

How does micronutrient therapy work?

Micronutrients can be given either orally or intravenously. However, the intravenous route is widely used for faster effect. Intravenous micronutrient therapy administers high concentrations of vitamins and minerals directly into the bloodstream, allowing rapid absorption of higher doses of the vitamins and minerals than if the person got them through food or supplements. Our body ordinarily absorbs nutrients slowly, whereas IV micronutrient therapy helps in rapid absorption of these nutrients at high doses into the bloodstream so they directly reach the cells and mitochondria, where they can be made available to be used readily and impart their beneficial effects.

Intravenous Micronutrient Therapy, includes options such as IV Myer's cocktail which consists of a mixture of different vitamins and minerals like IV Vitamin C, IV Vitamin B complex in varied concentrations. We also administer antioxidant drips consisting of IV Glutathione, IV N-Acetyl Cysteine, and more. These nutrients help maintain a robust immune system, aiding the body in its ability to ward off various infections. It is also a potential treatment for several conditions like fatigue, fibromyalgia, diabetes, asthma, depression and anxiety, migraines, withdrawals, hangovers, dehydration and cardiovascular diseases

Taking too much of certain micronutrients can cause toxicity and side effects of toxicity vary depending on the nutrient. Side effects include nausea, vomiting, constipation, gastric distress, fluid retention, anaphylaxis, low blood pressure and dizziness. Therefore the therapy has to be done by an expert professional.

What is the role of micronutrient therapy in Anti-aging?

Aging can be considered as a risk factor for micronutrient deficiency. With age, the absorption of nutrients is reduced due to lack of mobility, loss of appetite and changes occurring at a cellular level. Vitamins and antioxidants have crucial roles to play in maintaining bodily functions.

- (a) Vitamin C:** It acts as a powerful antioxidant that neutralizes free radicals, reducing oxidative stress, which contributes to cellular aging. It also aids in collagen synthesis, supporting skin elasticity and reducing the appearance of wrinkles.
- (b) Vitamin B:** Every Vitamin B constituent has an important role, like Vitamin B1 and Vitamin B2 supports energy metabolism and helps prevent cellular damage by boosting antioxidant activity and protecting cells from oxidative damage.. Vitamin B3 (Niacin) enhances DNA repair and reduces inflammation, promoting healthier, younger-looking skin. Vitamin B5 or Pantothenic Acid aids in skin barrier function and reduces signs of skin aging. Vitamin B6 or Pyridoxine supports protein metabolism, which is essential for maintaining healthy skin and cell regeneration. Vitamin B7 or Biotin is essential for healthy skin, hair, and nails, and plays a role in fat metabolism which affects skin health. Vitamin B9 or Methylfolate promotes DNA synthesis and repair, reducing the impact of aging at the cellular level. Vitamin B12 or Methylcobalamin supports nerve health and cellular energy, which can reduce feelings of fatigue and promote overall vitality.

- (c) **Vitamin D:** It supports immune health, helps in absorption of calcium , helps reduce inflammation, and protects against age-related diseases.
- (d) **Glutathione:** It is a key antioxidant that protects cells from oxidative damage, detoxifies harmful compounds, and supports DNA repair. It also helps maintain the health of skin cells, promotes an even skin tone, and supports immune function for overall anti-aging benefits.
- (e) **N-Acetyl Cysteine or NAC:** It boosts glutathione levels in the body, offering protection against oxidative damage and environmental toxins. It helps maintain cellular health and slows down the aging process by protecting tissues from free radicals

Suboptimal intake of micronutrients (vitamins and minerals) is linked to many age-related disorders including Cardiovascular diseases, some cancers and Alzheimer's disease. The initial effects of micronutrient deficiencies may be relatively mild and hence easily missed but in due course of time the deficiency has major effects at cellular levels. . For example, deficiencies in B vitamins may result in neuropathy, cognitive decline, depression , premature aging, wrinkles, dermatitis, weakened immunity and increased risk of cataract. Deficiencies in vitamin B12 and folate, are linked to cardiovascular disorders, deficiency in thiamine is linked to type 2 diabetes. Deficiency of vitamin D can lead to low bone density, osteoporosis, and increased risk of fractures, impairs immune function and is associated with higher risks of neurodegenerative disorders, including dementia and Alzheimer's disease. Vitamin C Deficiency leads to weakened collagen production, resulting in early signs of skin aging like wrinkles, sagging, and slower wound healing and contribute to degenerative diseases such as cardiovascular issues and weakened immunity. Deficiency of Glutathione reduces the body's ability to detoxify which accelerates cellular aging and increases the risk of degenerative diseases such as Parkinson's, Alzheimer's, and other neurodegenerative disorders. Depletion of glutathione impairs immune function, making the body more vulnerable to infections and chronic illnesses.

Hence, there is an urgent unmet need for adequate micronutrient supply to ensure healthy aging and prevent accelerated aging and age-related degenerative diseases.

The micronutrient therapy may have the following benefits in age related symptoms:

- Improve skin health. It boosts collagen supply, promotes cell turnover, reducing appearance of fine lines and wrinkles and helps the skin to firm up and look smoother.
- Improve hair and nail health by boosting hair shine, and volume, and combat thinning hair, while also helping to keep the nails strong.
- Improve immune system and reduce inflammation and lower the risk of infections
- At cellular level, it may help in maintaining DNA health and regulating cellular processes.
- Improve cognitive function

- Improve bone health, prevent bone loss and osteoporosis
- Maintain muscle function
- Improve heart health and lower the risk of cardiovascular diseases
- Maintain optimum blood pressure
- Improve colonic mobility
- Improve eyesight
- Improve emotional and mental wellbeing by managing irritability, depression, sleep, mood etc.
- Prevention of lifestyle diseases like Diabetes, Cancer, Etc.



How is it done at KLS Wellness Institute ?

At KLS Wellness Institute, IV vitamin therapy is administered in a safe and comfortable environment.

We conduct a detailed consultation where detailed history is collected and desired outcomes and health goals are discussed with each individual along with ruling out the contraindications.

After the consultation, a tailored IV vitamin blend is created, focusing on nutrients that support skin health, energy levels, and overall well-being. We prepare a blend of Myers cocktail and antioxidant infusion. This consists of Inj Vitamin C, Inj Magnesium chloride,

Inj optineuron, Inj Glutathione, Inj N acetyl cysteine.

The procedure is carried out in a dedicated treatment area, ensuring a relaxing atmosphere.

A trained healthcare professional inserts an IV catheter into a vein, allowing the micronutrient and anti-oxidant infusion to be delivered directly into the bloodstream. This method promotes faster absorption and effectiveness compared to oral supplements.

Throughout the infusion, the patient is monitored for comfort and any potential reactions. Sessions typically last between 30 to 60 minutes, during which patients can relax, read, or listen to music.

If the physician finds deficiency of Serum Vitamin D levels, then Vitamin D injection is also administered through an intramuscular route during the same session.

After the infusion, patients are provided with aftercare instructions. They may feel immediate benefits, such as increased energy or improved mood, with long term benefits observed over subsequent days.

Summary

Micronutrient therapy is a treatment involving administration of essential vitamins and minerals in high concentrations either orally or intravenously to replenish the body with the ideal balance of the vital nutrients. It helps in improving skin health, cardiovascular health, cognitive health, bone health, etc. that are affected due to aging.

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CHAPTER

Nine

Cryotherapy

What is Cryotherapy?

Cryotherapy literally means “cold therapy.” It is a non-invasive therapy where the body is exposed to extremely cold temperatures for several minutes. It is a fairly common in-office procedure and can be delivered to just one area, or whole-body. Localized cryotherapy can be administered in a number of ways, including through ice packs, ice massage, coolant sprays, ice baths, and even through probes administered into tissue. Cryotherapy can also be carried out in cryo chambers. There are two types of cryo chambers which differ in their mechanisms of action and their use. Partial-body cryotherapy makes use of liquid nitrogen to lower the temperature. The chamber used is an individual, tube-shaped enclosure that covers a person's body, but it has an open top to keep the head at room temperature. In whole body cryotherapy chamber contrast, the temperature is reduced electrically, and the user fully enters it, head excluded. The treatment typically involves exposing the individual to freezing, dry temperatures (at -40°C) for 2 to 4 minutes in one of these chambers.

Different substances including liquid nitrogen, liquid nitrous oxide or argon gas are used to create the intense cold used in cryotherapy.

How does cryotherapy work?

During cryotherapy, the body is exposed to very cold temperatures for a short time. Abnormal cells cannot survive this severe cold and die after treatment. The extreme cold temperature helps reduce inflammation in the body and reduces your pain or other symptoms. It also helps destroy abnormal tissues.

Cooling causes the blood vessels to constrict thereby reducing the blood flow to the areas of the swelling. Once the cooling is removed the blood vessels expand, and there is an increased presence of anti-inflammatory proteins in the blood. It lowers levels of inflammation and oxidative stress.

Blood flow being reduced in that injured area also reduces muscle spasms and soreness. This is important to activate the circulatory system to encourage healing and regenerate muscle fibers.

Cold therapy also reduces conduction of electrical signals that travel through our nerves, including pain signals thereby reducing pain. .

Cryotherapy finds its application in relieving muscle pain, sprains and swelling after soft tissue damage or surgery and can be used to treat a variety of conditions, especially skin conditions and cancers.

What is the role of Cryotherapy in Anti-aging

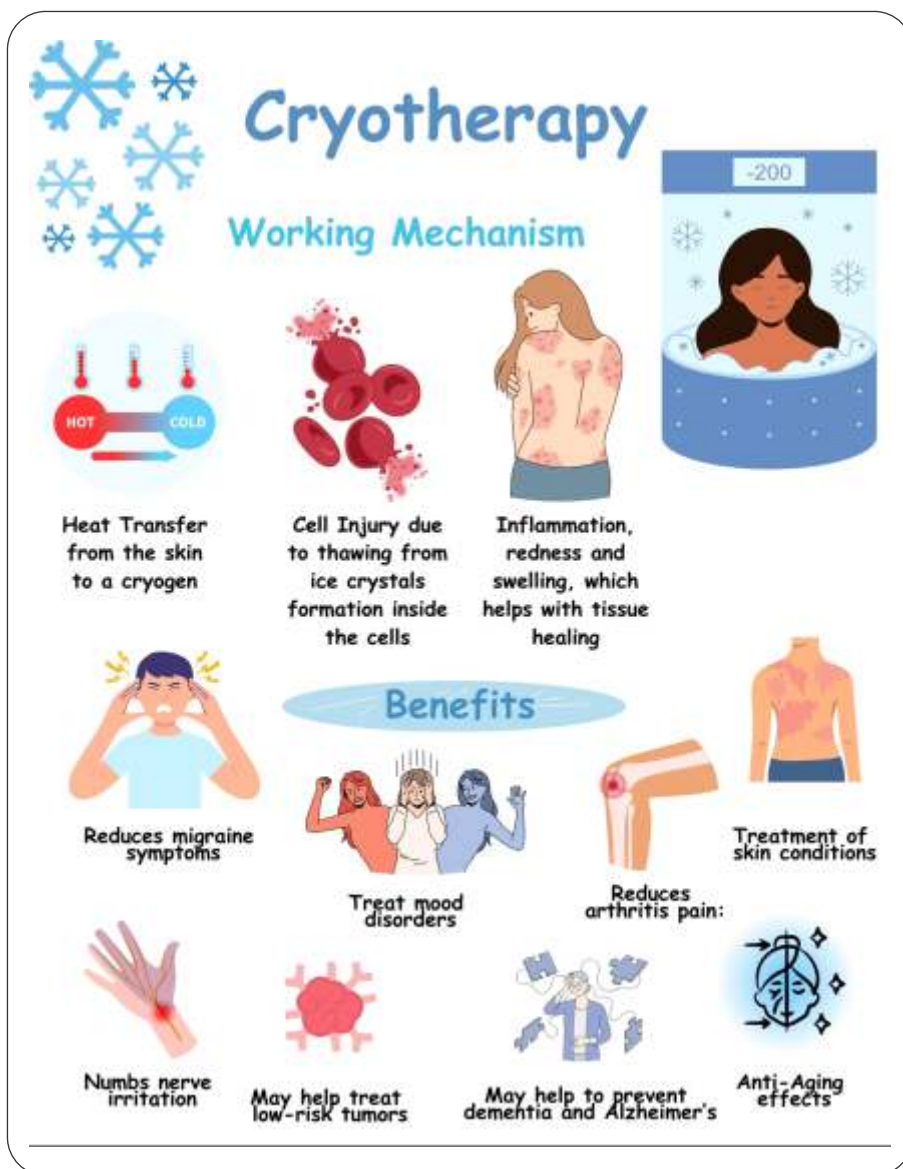
With aging, the metabolism slows down, circulation is affected, energy levels drop, there is toxin build up, reduced cellular regeneration, increased pain and inflammation. Cryotherapy helps mitigate these processes and aid in healthy aging.

Benefits of cryotherapy

There are many benefits of using cryotherapy across many areas. Some of them are mentioned as follows:

1. Enhances collagen production: Collagen is present in skin, bone, cartilage, ligaments and tendons. With age, collagen production slows down causing skin to loosen and bones to become fragile. Cold temperature in cryotherapy helps trigger production of more collagen. This enhances skin, bone and hair health.
2. Boost lymphatic system: Cryotherapy boosts the lymphatic system, enhances lymphatic drainage and works to flush harmful toxins out of the body. This further slows down aging
3. Boosts circulation: Cryotherapy helps boost blood pumping and thereby improves circulation. This helps in enhanced blood and oxygen supply to all the organs of the body improving their vitality.
4. Has antioxidant and anti-inflammatory effects : Cryotherapy has anti-oxidative and anti-inflammatory effects which helps combat the inflammatory and oxidative stress responses. This mechanism may help reduce the risk of age related diseases like Alzheimer's, Dementia and cancers.

5. Pain relief and muscle healing : Extreme cold temperatures numb the nerve irritation and reduces the pain in that area. It significantly reduces pain associated with arthritis. It also helps in muscle recovery.
6. Treats mood disorders: The ultra-cold temperatures in whole-body cryotherapy can cause physiological hormonal responses releasing adrenaline, noradrenaline, and endorphins. This has a positive effect on those experiencing mood disorders like anxiety and depression.
7. May help treat low-risk tumors: Targeted, localized cryotherapy can be used as a cancer treatment. In this context, it's called "cryosurgery." It works by freezing cancer cells and surrounding them with ice crystals. It's currently being used to treat some low-risk tumors for certain types of cancer, including prostate cancer.



Risks associated with Cryotherapy

Cryotherapy is a safe and non-invasive treatment. Side effects vary depending on the type of cryotherapy used. Having a cryotherapy treatment for any longer than a few minutes can be fatal.

If it is not administered under supervision, it may lead to frostbite. Other rare side effects include:

- Cerebral bleeding
- Dizziness
- Headache
- High blood pressure
- Frozen limb
- Long-lasting shivering
- Rash called cold panniculitis
- Sudden and temporary loss of memory

How do we do cryotherapy at KLS Wellness Institute?



The patient undergoes a thorough consultation and is assessed to check for contraindications before posting him for the whole body cryotherapy session. Vitals are checked to ensure it is within acceptable range. The patient is then sent to the changing room to change into minimal clothing. The whole-body cryotherapy machine is turned on, and the room temperature is set between 20-22°C.

Before starting, the nitrogen cylinder is loaded with liquid nitrogen and placed inside the chamber.

Before starting the session, cryo chamber is pre-cooled for 30 seconds to 1 minute, reaching a temperature of -50°C to -100°C. The patient, wearing minimal clothing and socks or specialized Cryo footwear, enters the chamber. Women can wear underwear and a bra, while men wear only underwear.

The floor of the unit is elevated so the patient's head remains outside and the shoulder aligns with the top of the chamber to allow breathing room air. The patient is instructed to place their hands on the padded ledge around the top of the chamber to protect their fingertips. The session lasts for 180 seconds, with temperatures dropping as low as -140°-160C.

During the session, the patient is asked to rotate over the lifted floor and asked to avoid placing hands on the surface inside the chamber to prevent frostbite. The ambient temperature in the chamber stays between -110 to -140 throughout the session.

Once the session ends, the floor descends down, and the patient steps out of the chamber to dress. After the session is completed, the patient's vitals are checked to ensure safety. Patient is asked to rest for a while and re-dress again.

Summary

Cryotherapy is a non-invasive therapy where the body is exposed to extremely cold temperatures for a short time. It enhances collagen production, boosts circulation, Has antioxidant and anti-inflammatory effects, relieves pain and helps in muscle healing.

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CHAPTER *Ten*

Gut Cleansing: Colon Hydrotherapy

What is colon hydrotherapy?

Hydrocolon Therapy, skillfully administered by trained technicians, involves the gentle irrigation of the gut with water through the insertion of a tube into the rectum. It is an ancient form of cleansing the colon (large intestine) and rectum with temperature and pressure controlled filtered water. It is a drug-free, safe and effective method of removing impacted fecal matter, retained gas, mucus and other waste materials from the colon. The procedure has definitely evolved with time, with modern technology ensuring both the safety and the sanitation of this popular cleansing practice.

How does colon hydrotherapy work?

A diet that lacks fiber combined with a sedentary lifestyle leads to a sluggish metabolism. The result is a slow moving intestine with weak peristalsis. Consequently, there is an increased incidence of constipation, gas, bloating and irregular bowel habits which further points out to the fact that waste products are not moving smoothly out of the body; there is more fermentation and putrefaction of undigested food by bacteria and yeast. These microbes produce toxic waste in the form of acids and gases, which in turn cause inflammation. The toxic substances damage the intestinal tissues, as well as the nerves and glands in and around the gut. Toxins are then absorbed through the walls into the blood and lymph and ultimately to other body cells, tissues and organs. Studies have shown that

these toxic substances can promote abnormal brain function, as well as cognitive, mood, and behavioural problems. Thus, although the human body is capable of detoxifying itself on a regular basis, at times, some toxins remain in the body due to a sluggish metabolism and thus require some external help to facilitate removal.

The water used to irrigate the colon hydrates its walls which helps loosen and wash out any old impacted fecal matter, mucus and other substances. Thus further production of toxins is inhibited and existing toxin build up eliminated. Water (sometimes mixed with additives such as vitamins, probiotics, enzymes, or herbs) is pumped into the colon .

What is the role of colon hydrotherapy in anti-aging?

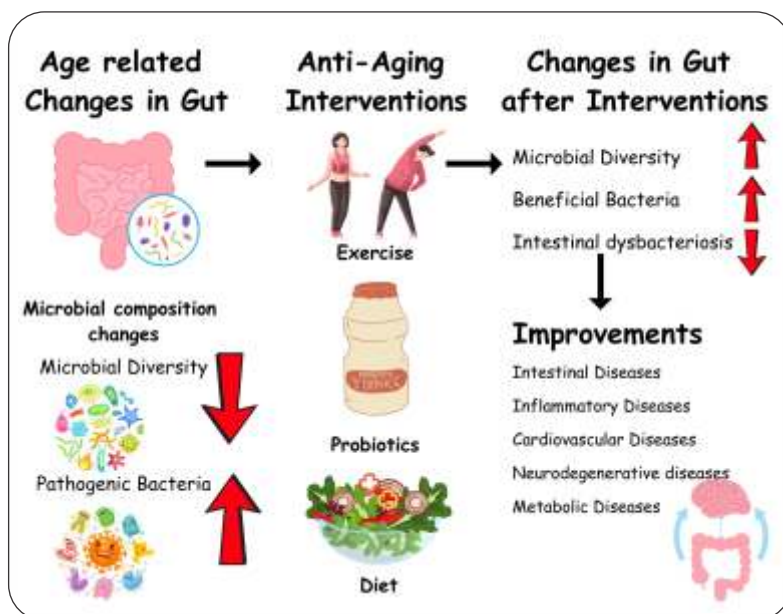
With aging, the digestion and gut motility becomes sluggish affecting the metabolism and waste removal. Since the toxins are not efficiently flushed out, they get accumulated within the gut disrupting its normal functioning.

The intestinal microbiota has become a key factor in the anti-aging process. As the intestinal microbiota also changes with aging, an imbalance in intestinal microorganisms can lead to many age-related degenerative diseases and unhealthy aging

Gut cleansing through Hydrocolon Therapy yields numerous benefits. It effectively rids the digestive tract of toxins, enhancing the absorption of vital nutrients, rejuvenating the gut flora, mitigating digestive issues, and promoting increased energy levels and mental clarity. The overall improvement in intestinal functions contributes to bolstering immunity and enhancing overall health.

Some Benefits of hydrocolon therapy include:

1. Improves Gut microbiota
2. Relieves Constipation, bloating, gas and indigestion



3. Helps with Irritable Bowel Syndrome
4. Treats Halitosis (Bad breath) and Constant coating over the tongue
5. Enhances energy and reduces lethargy
6. Helps in Weight management
7. Improves Mood disorders

Risks involved

Mild temporary side effects may include:

- Dehydration
- Stomach pain and cramping
- Fullness and Bloating
- Diarrhea
- Dizziness, nausea, and vomiting
- Anal irritation and soreness

Rare severe complications of hydrotherapy of the colon can include:

- Perforated Bowel
- Pancreatitis
- Kidney Failure
- Heart Failure

Contradictions-

Individuals with following conditions are advised not to undergo hydrocolon therapy:

- Anal Fissures And Fistulas
- Perforation Of The Intestine
- Acute Hemorrhoids
- Nonspecific Ulcerative Colitis
- Crohn's Disease
- Tumors Of Intestines And Rectum
- Recent Surgery On The Intestine And Abdominal Wall
- Bleeding Of The Gastrointestinal Tract
- Inguinal And Ventral Hernia
- Kidney Failure
- Severe Cardiovascular Diseases
- Pregnancy
- Uncontrolled Hypertension

How is it done at KLS wellness Institute?

At KLS Wellness, when a patient arrives, we start by evaluation. Afterward, the doctor conducts a thorough consultation, checking for any contraindications. Once that's done, we explain the entire procedure to the patient, including the dietary guidelines.



On day one, we administer an oil enema, followed by a herbal enema on day two. On the third day, the patient undergoes colon hydrotherapy. We ensure that both the pre- and post-procedure diets are clearly explained to the patient at each step.

Pre-procedure and post procedure Diet

Drink Plenty of fluids (Water, Soups, Lime juice, Coconut water 200ML) throughout the day.

Breakfast- 1 bowl of Papaya and Kiwi + Watermelon (any other fruits)

Lunch - 1 bowl of Mix Vegetable Soup

+ 1 Bowl of Green Salad (any soup or salad)

Dinner- 1 bowl of Tomato Soup + 1 Bowl of Mix Veg Salad (any soup or salad)

(If hungry then they can take plain khichdi/ plain dal rice- No spices, no chili, No tadka)

Day of The Procedure Diet

Breakfast - 1 bowl of Watermelon / papaya
(or any fruit)

Lunch - 1 Bowl Curd rice / bowl dal khichdi with curd

Dinner - 1 Bowl Curd rice / bowl dal khichdi with curd or Greek Yogurt

Preparation for the Procedure: During the session, you will be asked to change into a gown and lie comfortably on a treatment bed. A small, sterile tube called a speculum will be gently inserted into the rectum. This tube is connected to a device that controls the flow of purified water into the colon. Throughout the procedure, the water temperature and pressure are carefully regulated to ensure a gentle and safe process.

Water Infusion and Cleansing: Once the speculum is in place, warm water is slowly introduced into the colon in a series of controlled flows. As the water fills the colon, it

loosens and hydrates impacted waste and debris. The water and waste are then expelled through the tube, which is attached to a closed system to ensure hygiene and comfort. This process is repeated several times during the session to thoroughly cleanse the colon.

Massage and Stimulation: To enhance the effectiveness of the procedure, the therapist may gently massage your abdomen to help break up waste and improve the release of toxins. This also helps stimulate natural peristalsis, the muscular contractions that move food through the digestive tract.

Completion and Rest: Once the cleansing process is complete, the tube is carefully removed, and you will be given privacy to use the restroom. Afterward, the therapist will check on your comfort, offer hydration, and provide recommendations for post-treatment care, such as staying hydrated and consuming light, nutritious meals.

Summary

Hydrocolon Therapy involves the gentle irrigation of the gut with water. It is a drug-free, safe and effective method of removing harmful waste and toxins from the intestines, leading to improved intestinal function, better immune response, and a reduction in age-related diseases. By maintaining optimal gut health, the body can better manage oxidative stress and inflammation.

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CHAPTER *Eleven*

Naturopathy: Acupressure, Deep Tissue Mobilization, Shirodhara, Basti Treatment

Naturopathy is a holistic approach that uses natural remedies and physical means to improve overall health. It is a complementary therapy used alongwith other medical and therapeutic techniques. These therapies include herbal medicine, lifestyle changes, ayurvedic practices, massage, acupressure etc

The foundations of naturopathy are based on the importance of a healthy lifestyle, exercise and stress management. Its aim is to support the body's own capacity to heal and prevent any illness from occuring in the future.

Naturopathic treatments help slow down the process of aging and boost the immune system.

With aging, there is toxin build up in the body which may manifest into various health conditions. Naturopathic treatments aid in the cleansing process of the body, thereby enhancing the normal functioning and performance of the body.

Below are some naturopathic treatments offered at KLS wellness institute:

1. ACUPRESSURE:

Acupressure is a non-invasive treatment which consists of applying precise pressure to various pressure points present throughout the body. The pressure applied to these points is said to effectively clear lactic acid and other toxin build-up from the body. This helps in pain relief, reduced muscle tension, and enhanced circulation of blood, oxygen and vital nutrients to various tissues and organs promoting overall health and well being.

Acupressure could have the following benefits in managing and slowing down the signs of aging :

- Improved Blood Circulation
- Relaxation and Stress Reduction
- Improved Muscle Tone
- Skin Rejuvenation
- Overall Relaxation
- Reduces puffiness and swelling
- Reduces jaw tension
- Improves quality of life

Side Effects:

The side effects associated with acupuncture are considered mild and negligible. They include:

- Soreness.
- Bruising
- Lightheadedness
- Dizziness
- Nausea
- Tired feeling

2. DEEP TISSUE MOBILIZATION:

Deep tissue mobilization is a massage technique that targets chronic tension in the deeper layers of muscles. The physical pressure applied by the therapist helps in relaxing muscles, promoting healing and breakdown of scar tissue. The aim of deep tissue mobilization is to stretch and release the soft tissue of the body. It helps ease muscle tension in areas such as necks, back and shoulders, increasing flexibility and range of movement. During muscle injury or tension, there is formation of adhesions or knots which are bands of rigid tissue which cause pain, inflammation and limit movement. Deep tissue mobilization breaks down these adhesions, or knots relieving pain and restoring normal movement. It increases blood flow to the area being massaged, reducing inflammation and promoting healing. It also helps in removal of toxic waste thereby enhancing the body's healing process.

Unlike classic massage therapy, which is used for relaxation, deep tissue massage usually focuses on specific problems such as: chronic pain, osteoarthritis pain, limited mobility, recovery from injuries, repetitive strain injury, fibromyalgia, and muscle spasms

Benefits of Deep Tissue Mobilization include improvement in following areas:

- Muscle injury
- Muscle spasm
- Contractures
- Carpal Tunnel Syndrome
- Arthritis
- Scar tissue
- Fibromyalgia
- Sciatica

Side Effects

The side effects associated with this deep tissue mobilization are temporary and easily manageable.

- Soreness
- Fatigue
- Headaches
- Nausea
- Bruising
- Inflammation
- Redness or heat

3. SHIRODHARA:

It is a well-established Ayurvedic procedure which involves the gradual and consistent dripping of medicated oils or other liquids such as milk, buttermilk or water onto the forehead. “Shiro” means head and “dhara” means flow. The flow of the liquid is set at a controlled rate. It induces a state of alert calmness similar to the relaxation response observed during meditation.

Benefits of Shirodhara:

- Improves sleep quality
- Helps in anti aging
- Manage insomnia
- Reduces anxiety and nervousness
- Relieves headaches
- Treats fatigue
- Reduces stress and promotes relaxation and rejuvenation
- Manages hypertension

Side Effects

Rare and manageable side effects of Shirodhara include:

- Heaviness in the head after treatment:
- Lightheadedness

- Sluggishness for a short time.
- Redness or irritation
- Allergic reactions to the oils or herbal ingredients

4. BASTI TREATMENT:

Basti treatment, also known as medicated enema therapy, helps in cleansing and rejuvenation of the body. This therapy involves the introduction of herbal decoctions and oils into the rectum to eliminate toxins and promote overall well-being.

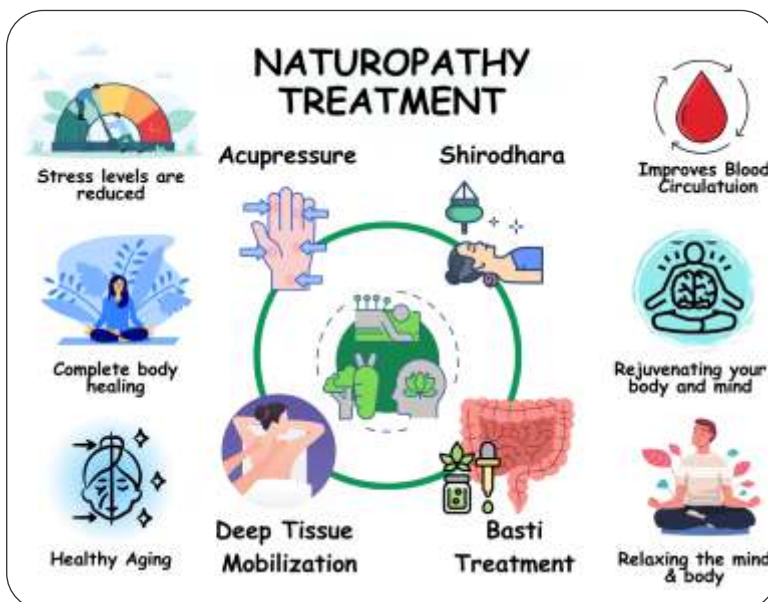
TYPES:

1. **Anuvasana Basti:** This type involves the administration of medicated oils into the rectum.
2. **Niruha Basti:** This is known as a decoction enema containing herbal decoctions along with oils.
3. **Uttara Basti:** Uttara Basti focuses on treating reproductive and urinary disorders and is administered through the urinary tract.
4. **Matra Basti:** When small amounts of oil or herbal preparations are given daily for a specific duration, this is referred to as Matra Basti.

The type of Basti treatment to be administered is carefully selected by the Ayurvedic expert as per the individual's condition.

Benefits of Basti Treatment:

1. Promote Detoxification by elimination of accumulated toxins from the body
2. Improves digestion, alleviates constipation, and enhances the absorption of nutrients
3. Rejuvenates the body, improves vitality, and enhances the quality of life.
4. It helps in slowing of aging processes and has anti-aging benefits



Side Effects

Basti therapy generally has minimal side effects. However, improper use or overdose may lead to:

- Dehydration:
- Electrolyte Imbalance:
- Allergic Reactions: Rare but possible reactions to specific herbal ingredients.
- Although rare, some individuals may experience mild discomfort, bloating, or temporary bowel irregularities after Basti treatment.

How are these treatments done at KLS Wellness Institute?



All the above mentioned treatments are administered by experts after analysing the risks and contraindications. These treatment sessions last between 30-60 minutes and are often combined with other treatments to enhance relaxation.

Summary

Naturopathy is a holistic approach that includes herbal medicine, lifestyle changes, ayurvedic practices, massage, acupressure etc which helps slow down the process of aging and boost the immune system.

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CHAPTER

Twelve

Yoga and Meditation

What is Yoga and Meditation?

Yoga is a holistic discipline that combines physical postures (asanas), breathing exercises (pranayama), and chanting to bring harmony between mind and body.

Meditation focuses on calming the mind and finding inner peace through techniques like mindfulness or visualization.

So, while yoga is more active and involves movement, meditation is about stillness and mental focus.

Yoga offers a holistic approach to enhancing both physical and mental well-being. Through its diverse range of poses, yoga improves flexibility, builds strength, and enhances balance, contributing to overall physical health. Additionally, the integration of mindfulness and meditation practices yields significant mental health benefits, including enhanced cognitive function, reduced stress, and improved mental clarity.

How does yoga and meditation work?

Chronic stress wreaks havoc on the body causing high cortisol levels, inflammation, and oxidative damage. These processes accelerate cellular as well as physical aging

impacting normal functioning of the organs. Stress weakens the immune system, and studies have shown that stress-prone individuals tend to experience a decline in organ function, reduced muscle mass, and decreased bone density at an accelerated rate.

Aging isn't solely about the body. Cognitive aging, often linked to neurodegenerative diseases, is equally important. Recent research suggests that mindfulness meditation can be a potent tool in preserving cognitive function. Meditation enhances brain plasticity, which is the brain's ability to adapt and learn. It safeguards against age-related cognitive decline. Studies have demonstrated the cognitive benefits of meditation in terms of memory improvement, attention enhancement, and reduced cognitive decline. Additionally, mindfulness meditation has shown promising results in reducing the risk of neurodegenerative diseases such as Alzheimer's

Studies have demonstrated that interventions incorporating classical yoga postures, breathing exercises, and meditation was associated with positive changes in the levels of biomarkers of cellular aging including 8-OH2dG, a product of DNA damage; oxidative stress markers; and telomeres, the cellular clocks that shorten with each cell replication

Benefits of Yoga and meditation in anti-aging

Both yoga and meditation have been around for centuries, but recent scientific research has confirmed that these practices offer a range of benefits for both the mind and body and helps in overall wellbeing.

The following are the benefits;

- Reduced Stress and Anxiety
- Improved Sleep Quality



- Increased Flexibility and Strength
- Enhanced Focus and Concentration
- Greater Self-Awareness
- Detoxification
- Improved Circulation
- Improved Skin Elasticity and hair health

Summary

Both yoga and meditation have been around for centuries as an holistic approach that benefits both the mind and body and helps in overall wellbeing. It reduces stress, improves sleep quality, improves flexibility and strength, helps in circulation and detoxification thereby helping in maintaining a healthy life.

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CHAPTER

Thirteen

Diet and Nutrition

Aging is an inevitable process, but the speed and manner in which we age are greatly influenced by our lifestyle choices, particularly what we eat and how we care for our body and mind. This chapter explores a holistic approach to anti-aging, with practical, science-backed tips that promote vitality, support mental and physical well-being, and enhance longevity.

Nutrition plays a significant role in how quickly or slowly we age. Eating the right foods can help keep our bodies functioning well, lower the risk of chronic illnesses, and support healthy aging.

The Science of Aging and Nutrition

As we age, the body undergoes numerous changes: metabolic processes slow, collagen production diminishes, muscle mass decreases, and oxidative stress increases. These natural processes contribute to visible signs of aging, such as wrinkles, and less visible effects, like reduced energy, weakened immunity, and cognitive decline. However, nutrition can play a pivotal role in mitigating these effects.

The key to an anti-aging diet is not only what you include but also what you avoid. By integrating nutrient-dense foods and adopting wellness practices, you can protect against aging from the inside out.

Key Nutrients for Anti-Aging

Several nutrients have been identified for their role in combating the adverse effects of aging. These include antioxidants, healthy fats, proteins, vitamins, and minerals. Let's explore some of the most effective nutrients for anti-aging, their physiological benefits, and the best food sources to incorporate into a daily diet.

Antioxidants: Protecting Cells from Oxidative Damage

Oxidative stress, caused by an imbalance between free radicals and antioxidants in the body, is one of the primary contributors to aging. Free radicals are unstable molecules that can damage cells, leading to accelerated aging and the onset of diseases like cancer and cardiovascular conditions. Antioxidants neutralize these harmful molecules, protecting cells and tissues.

➤ Vitamin C:

Vitamin C, also known as ascorbic acid, is a powerful antioxidant that supports collagen production, essential for maintaining skin elasticity and firmness. It also plays a role in repairing damaged skin and reducing wrinkles.

- Sources: Citrus fruits (oranges, lemons, grapefruits), strawberries, kiwi, bell peppers, and spinach.

➤ Vitamin E:

Vitamin E is a fat-soluble antioxidant that helps prevent lipid peroxidation in cell membranes. It protects the skin from damage caused by ultraviolet (UV) radiation and environmental pollutants.

- Sources: Nuts and seeds (almonds, sunflower seeds), spinach, avocado, and wheat germ oil.

➤ Selenium:

Selenium is a trace mineral that works synergistically with vitamin E to combat oxidative stress and inflammation. It helps support the immune system and prevent age-related cognitive decline.

- Sources: Brazil nuts, mushrooms, sunflower seeds, eggs, and poultry.

➤ Polyphenols and Flavonoids:

Polyphenols are bioactive compounds found in plant foods that exhibit strong antioxidant and anti-inflammatory properties. Flavonoids, a subclass of polyphenols, are known to support heart health and reduce the risk of neurodegenerative diseases.

Sources: Berries (blueberries, raspberries, and strawberries), green tea, dark chocolate, red wine, and olive oil.

Healthy Fats: Promoting Cellular Integrity and Cognitive Function

Healthy fats, particularly omega-3 fatty acids, play a critical role in maintaining cell membrane integrity and supporting brain health. They also possess anti-inflammatory properties that help reduce the risk of chronic diseases associated with aging.

➤ **Omega-3 Fatty Acids:**

Omega-3s, particularly eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA), are essential fats that support cardiovascular health, reduce inflammation, and protect against age-related cognitive decline.

-Sources: Fatty fish (salmon, mackerel, sardines), flaxseeds, chia seeds, and walnuts.

• **Monounsaturated Fats:**

Monounsaturated fats, such as those found in olive oil, are beneficial for heart health and help maintain skin elasticity and moisture.

-Sources: Olive oil, avocados, and nuts (almonds, hazelnuts).

Proteins and Amino Acids: Preserving Muscle Mass and Skin Health

Protein is vital for repairing tissues, building muscle mass, and maintaining overall body function. As we age, muscle mass tends to decline (a condition known as sarcopenia), which can impair mobility and quality of life.

➤ **Collagen:**

Collagen is a protein that provides structural support to the skin, connective tissues and bones. Supplementing with collagen or consuming foods that promote collagen production can improve skin elasticity and reduce the appearance of wrinkles.

-Sources: Bone broth, chicken, fish, and egg whites.

-foods that promote collagen production- Berries, leafy greens, garlic, Nuts and seeds.

➤ **Amino Acids (L-arginine and L-carnitine):**

Amino acids like L-arginine and L-carnitine support mitochondrial function and energy production. They are also linked to improved muscle strength and endurance.

-Sources: Meat, poultry, dairy products, and legumes, chickpeas, Nuts and seeds

Vitamins and Minerals: Supporting Cellular Health and Longevity

Vitamins and minerals are essential for various metabolic processes, including DNA repair, energy production, and enzyme function. A deficiency in these nutrients can accelerate aging and increase the risk of chronic diseases.

➤ **Vitamin D:**

Vitamin D plays a crucial role for bone health and immune function. It helps maintain calcium balance, reducing the risk of osteoporosis and fractures in older adults.

-Sources: exposure to sunlight, Fatty fish and fortified dairy products, mushrooms.

➤ **B Vitamins (B6, B9, and B12):**

B vitamins are important for DNA synthesis, energy production, and brain health. Deficiencies in these vitamins are associated with cognitive decline and an increased risk of cardiovascular disease.

-Sources: Whole grains, legumes, leafy greens, avocado, citrus fruits, eggs, and meat.

➤ **Magnesium:**

Magnesium is involved in many biochemical reactions in the body, including muscle function, nerve transmission, and energy production. Adequate magnesium levels support bone health and reduce the risk of age-related diseases.

-Sources: Dark leafy greens, nuts, seeds, whole grains, and legumes.

Dietary Patterns and Foods for Anti-Aging

While individual nutrients are essential, adopting specific dietary patterns can maximize their benefits. The Mediterranean diet, for example, rich in fruits, vegetables, whole grains, nuts, and olive oil, has been consistently associated with increased longevity and reduced risk of age-related diseases. The emphasis on plant-based foods, lean proteins, and healthy fats provides a broad spectrum of anti-aging nutrients.

Incorporating a variety of nutrient-dense foods into the daily diet, such as fatty fish, colorful vegetables, berries, nuts, seeds, and whole grains, ensures a comprehensive intake of vitamins, minerals, and antioxidants necessary for healthy aging.

Some Strategies to enhance diet:

Incorporating these practical dietary tips can help slow down the aging process, boost energy, and reduce the risk of age-related diseases.

1. Stay Hydrated

- Drink at least 8 glasses of water daily to keep your skin hydrated and support your body's detoxification process.
- Start your morning with a glass of warm water with lemon to boost hydration and digestion.
- Add herbal teas such as green tea, peppermint tea, chamomile tea which are high in anti-oxidants.

2. Eat the Rainbow

- Include a variety of colorful fruits and vegetables in your diet. These provide antioxidants that fight free radicals, reduce inflammation, and slow aging.
- Aim for at least 5 servings of fruits and vegetables per day, focusing on dark leafy greens, berries, and citrus fruits.

3. Incorporate Omega-3 Fatty Acids:

- Omega-3 fatty acids are essential for reducing inflammation, supporting heart health, and maintaining brain function.
- Include fatty fish like salmon, mackerel, and sardines, or plant-based options like chia seeds, flaxseeds, and walnuts, fish oil supplements.
- Include sources of healthy fats like olive oil, avocados, nuts, seeds, and fatty fish. Limit unhealthy trans fats found in fried and processed foods.

4. Prioritize Plant-Based Proteins:

- Plant-based proteins are easier on the body, reduce inflammation, and contain fiber, which is essential for gut health — a key factor in healthy aging.
- Replace some animal proteins with legumes, nuts, seeds, tofu, and quinoa.

5. Add Whole grains:

- Whole grains are rich in fiber, which promotes digestion, regulates blood sugar, and reduces inflammation.
- Replace refined grains (white bread, pasta) with whole grains like quinoa, brown rice, oats, barley, and farro.

6. Limit Sugar and Processed Foods:

- Excess sugar and highly processed foods contribute to inflammation, weight gain, and accelerate the aging process by increasing oxidative stress.
- Minimize consumption of processed and packaged foods high in sugar, unhealthy fats, and preservatives, which accelerate aging and promote chronic diseases.
- Opt for fresh, whole foods like vegetables, lean proteins, and whole grains whenever possible.

7. Add Fermented Foods for Gut Health:

- A healthy gut microbiome is linked to improved immune function, better digestion, and reduced inflammation — all critical for healthy aging.
- Add yogurt, kefir, sauerkraut, kimchi, and kombucha in your diet to promote good gut bacteria.

8. Consume More Fiber

- Eat fiber-rich foods like whole grains, legumes, fruits, and vegetables to support digestive health and reduce the risk of heart disease and diabetes.
- Start meals with a fiber boost: add chia seeds to your breakfast smoothie or enjoy a vegetable salad before your main meal.

9. Consume Curcumin (Turmeric):

- Curcumin, the active compound in turmeric, has potent anti-inflammatory and antioxidant properties that may help reduce the risk of age-related diseases.
- Add turmeric to your meals, smoothies, or teas. You can also consider curcumin supplements for a more concentrated dose.
- Combine turmeric with black pepper to enhance its absorption in the body.

10. Include Probiotic and Prebiotic Foods:

- Probiotics support the balance of good bacteria in your gut, while prebiotics (fiber-rich foods) nourish these beneficial microbes.
- Consume probiotic-rich foods like yogurt, kefir, and fermented vegetables. Add prebiotic foods like onions, garlic, bananas, and asparagus to feed healthy gut bacteria.

11. Reduce Sodium Intake:

- High sodium intake can lead to high blood pressure, increasing the risk of cardiovascular issues as you age.
- Limit processed and packaged foods, as these tend to be high in sodium. Opt for fresh herbs, spices, lemon juice, or vinegar to season your meals instead of salt.

12. Maintain Regular Physical Activity

- Engage in 30 minutes of moderate exercise (like brisk walking or swimming) most days of the week. Physical activity promotes circulation, supports mental health, and maintains muscle strength.

13. Prioritize Sleep

- Aim for 7-8 hours of quality sleep per night. Good sleep is essential for cellular repair, mental clarity, and overall well-being.
- Create a calming bedtime routine: reduce screen time, read, or practice relaxation techniques like deep breathing.

14. Manage Stress Effectively

- Incorporate stress-reducing practices such as meditation, yoga, or even simple

breathing exercises to lower inflammation and promote longevity.

- Take time each day for self-care or activities that help relax the mind, like spending time in nature or journaling.

15. Embrace a Balanced Lifestyle

- In addition to diet and exercise, mental well-being plays a crucial role in aging gracefully. Foster social connections, pursue hobbies, and find joy in everyday moments.
- Schedule regular health check-ups to monitor and maintain overall health as you age.

Tips for Vegetarians to increase protein intake

➤ Incorporate Legumes and Pulses

- Include lentils, chickpeas, kidney beans, and black beans in curries, salads, or soups. These are excellent sources of plant-based protein.
- Make hummus from chickpeas or dal from lentils a regular part of your meals.

➤ Use Protein-Rich Grains

- Replace regular rice or wheat with quinoa, millets, or amaranth—all of which are higher in protein.
- Prepare breakfast porridge or upma with these grains for a protein-packed start to the day.

➤ Include Dairy or Plant-Based Dairy Alternatives

- Opt for Greek yogurt, paneer (Indian cottage cheese), or low-fat cheese to add a rich source of protein to your diet.
- If you prefer plant-based options, choose soy milk or almond yogurt fortified with protein.

➤ Add Nuts and Seeds

- Include almonds, pumpkin seeds, chia seeds as a topping on salads, cereals, or smoothies to increase protein content.
- Prepare nut butters like almond butter or peanut butter for a protein-rich snack paired with fruits.

➤ Eat More Tofu or Tempeh

- Use tofu or tempeh in stir-fries, salads, or soups as a versatile and high-protein plant-based option.
- Marinate tofu for added flavor and grill or bake for a protein-rich dish.

➤ Use Protein Supplements

- Use whey protein to add more protein.
- Consider adding plant-based protein powders (like pea protein or soy protein) to smoothies or oatmeal

Some protein rich recipes

1. Turmeric Quinoa Khichdi:

- Ingredients: Quinoa, yellow lentils (moong dal), turmeric, ginger, cumin, and ghee.
- Benefits: High in protein, rich in antioxidants (from turmeric), and easy to digest. Helps in weight management and reduces inflammation.

2. Methi (Fenugreek) Thepla with Flaxseeds and chickpea flour:

- Ingredients: Whole wheat flour, chickpea flour, fenugreek leaves, flaxseeds, and a dash of turmeric.
- Benefits: Fenugreek is great for blood sugar control and reducing inflammation. Flaxseeds provide omega-3 fatty acids, boosting skin health and metabolism, addition of chickpea will help increase protein content.

3. Vegetable and Lentil Soup:

- Ingredients: Red lentils, spinach, carrots, tomatoes, ginger, garlic, and spices like cumin and turmeric.
- Benefits: Rich in protein, fiber, vitamins, and minerals, promoting both skin health and weight loss while improving gut health.

4. Sprouted Moong Salad with Lemon and Olive Oil:

- Ingredients: Sprouted moong beans, chopped cucumber, tomatoes, onions, lemon juice, and olive oil.
- Benefits: Rich in antioxidants, vitamins C and E, which help reduce aging signs. Low in calories and highly satiating.

5. Grilled Paneer with Mint Chutney:

- Ingredients: Paneer (low-fat), mint, cilantro, lime, and spices.
- Benefits: A good source of protein and calcium, supporting muscle health and skin elasticity. Mint improves digestion and metabolism.

6. Avocado and Quinoa Salad:

- Ingredients: Cooked quinoa, avocado, cherry tomatoes, cucumbers, olive oil, and lemon juice.

- Benefits: Quinoa is protein-rich and helps with weight loss. Avocado provides healthy fats, vitamin E, and antioxidants for glowing skin.

3. Chia Pudding with Almond Milk:

- Ingredients: Chia seeds, unsweetened almond milk, vanilla extract, and berries.
- Benefits: High in fiber and omega-3s, chia seeds promote weight loss and keep skin hydrated. Almond milk is low-calorie and rich in vitamins.

4. Spinach and Kale Smoothie:

- Ingredients: Spinach, kale, green apple, cucumber, and a spoon of flaxseeds.
- Benefits: This detoxifying smoothie is high in antioxidants, fiber, and vitamins that promote skin health and reduce inflammation, while being low in calories.

5. Roasted Sweet Potato and Lentil Salad

- Ingredients: Sweet potatoes, green lentils, baby spinach, olive oil, and balsamic vinegar.
- Benefits: Sweet potatoes are rich in beta-carotene, which improves skin elasticity, while lentils are high in protein and fiber, supporting weight loss.

Role of Curcumin in Anti-aging

Curcumin, a polyphenolic compound derived from turmeric, has gained significant attention for its role in anti-aging due to its potent antioxidant, anti-inflammatory, and neuroprotective properties.

Curcumin exhibits multiple mechanisms of action that contribute to its anti-aging effects:

- Antioxidant Activity:** Curcumin neutralises free radicals and enhances the activity of antioxidant enzymes (e.g., superoxide dismutase, glutathione peroxidase). By reducing oxidative stress, curcumin helps protect cells from damage caused by the free radicals, which are implicated in aging and age-related diseases.
- Anti-Inflammatory Properties:** Chronic inflammation is a hallmark of aging and is associated with various age-related diseases. Curcumin modulates inflammatory pathways thereby reducing systemic inflammation in the body.
- Cellular Signalling Pathways:** Curcumin activates key cellular signalling pathways,, which regulates the antioxidant and detoxifying activities. Additionally, curcumin has been shown to influence autophagy, a cellular process that removes damaged organelles and proteins, thereby promoting cellular health.
- Mitochondrial Function:** Mitochondrial dysfunction is a significant contributor to aging and age-related diseases. Curcumin has been shown to enhance mitochondrial biogenesis and function, leading to improved energy metabolism and reduced

oxidative stress within mitochondria.

Therapeutic role of Curcumin in Age-Related Diseases:

- (i) **Neurodegenerative Disorders:** Curcumin has demonstrated neuroprotective effects in conditions such as Alzheimer's and Parkinson's disease. Its ability to reduce inflammation, inhibit the aggregation of amyloid-beta plaques, and enhance neurogenesis supports cognitive function and protects against neurodegeneration.
- (ii) **Cardiovascular Health:** Curcumin improves endothelial function, reduces arterial stiffness, and lowers cholesterol levels. Its anti-inflammatory and antioxidant properties contribute to cardiovascular health, potentially reducing the risk of atherosclerosis and heart disease in aging individuals.
- (iii) **Metabolic Syndrome and Diabetes:** Curcumin helps regulate glucose metabolism and improves insulin sensitivity, making it beneficial in the prevention and management of type 2 diabetes. It also aids in weight management by promoting lipid metabolism and reducing fat accumulation.
- (iv) **Cancer Prevention:** Curcumin exhibits anti-cancer properties by inhibiting cell proliferation, inducing apoptosis in cancer cells, and preventing metastasis. Its ability to modulate various signaling pathways involved in cancer development makes it a promising agent in cancer prevention strategies, particularly in aging populations.

Bioavailability of Curcumin and Tips for Enhancing Curcumin Absorption::

Despite its therapeutic potential, curcumin's bioavailability is limited due to its rapid metabolism and poor absorption. However, Various strategies have been developed to enhance curcumin bioavailability such as:

- (a) Combining it with piperine (found in black pepper) significantly enhances its absorption by up to 2000%.
- (b) Combining with healthy fats, which can further improve its bioavailability. Curcumin is fat-soluble, meaning it is better absorbed when consumed with healthy fats such as olive oil, coconut oil, or avocado.

How to include curcumin in the diet:

Following are several practical ways to add curcumin (turmeric) into daily diet for its anti-aging benefits:

1. Turmeric Tea (Golden Milk)

Turmeric powder along with a pinch of black pepper in a cup of milk (or plant-based milk like almond or coconut milk). This has antioxidant and anti-inflammatory properties and also helps in relaxation.

2. Add Turmeric to Smoothies

Blend turmeric powder or fresh turmeric root into fruit or green smoothies. Combining it with ingredients like banana, spinach, and ginger enhances its flavor while supporting overall health. This is a quick and easy way to increase curcumin intake, especially in the morning, while getting additional vitamins and minerals from fruits and vegetables.

3. Curcumin Supplements

Curcumin supplements are available in capsule or tablet form, often combined with piperine (black pepper extract) for better absorption. Taking supplements is a convenient way to ensure a concentrated dose of curcumin daily. Supplements offer a consistent and higher intake than dietary sources alone.

4. Use Turmeric in Cooking

Incorporate turmeric into soups, salad dressings, roasted vegetables, dips, stews, curries, rice, and stir-fries. Combine it with black pepper and healthy fats for better absorption. Cooking with turmeric on a regular basis increases overall intake of curcumin without drastically changing the diet.

5. Turmeric-Infused Oils

Add turmeric powder to olive oil or coconut oil, heating it gently to create an infused oil. This oil can be used for sautéing vegetables, marinating meat, or drizzling over salads and grains. Combining curcumin with healthy fats enhances its bioavailability, making it more easily absorbed by the body.

Some diets which can be helpful during the antiaging journey.

It is very important to follow these diets under supervision of a professional so as to avoid any deficiencies.

1. Mediterranean Diet:

- Key Foods^{**}: Olive oil, fish, whole grains, fruits, vegetables, nuts, and legumes.
- Benefits^{**}: Rich in antioxidants and healthy fats, this diet reduces inflammation, improves heart health, and promotes longevity.

2. Plant-Based Diet:

- Key Foods: Vegetables, fruits, whole grains, legumes, nuts, and seeds.
- Benefits: High in fiber and antioxidants, supports weight loss, reduces the risk of chronic diseases, and promotes healthy skin and aging.

3. Intermittent Fasting:

- Method: Alternating between periods of eating and fasting (e.g., 16:8 method).
- Benefits: Improves metabolism, supports weight loss, and activates cellular repair

processes that slow aging.

4. Low-Carb Diet:

- Key Foods: Healthy fats (avocados, nuts, seeds), non-starchy vegetables, lean proteins.
- Benefits: Promotes fat burning, weight loss, and improves cognitive health while reducing inflammation.

5. Dash Diet (Dietary Approaches to Stop Hypertension):

- Key Foods: Fruits, vegetables, lean proteins, low-fat dairy, whole grains, and reduced salt.
- Benefits: Lowers blood pressure, promotes heart health, aids in weight loss, and reduces signs of aging by improving vascular health.

6. Paleo Diet:

- Key Foods: Lean meats, fish, fruits, vegetables, nuts, and seeds (avoiding processed foods and grains).
- Benefits: Encourages natural, whole foods rich in vitamins and antioxidants, supporting skin health and reducing weight.

7. Anti-Inflammatory Diet:

- Key Foods: Turmeric, green leafy vegetables, berries, nuts, fatty fish, and olive oil.
- Benefits: Reduces chronic inflammation, a major cause of aging and disease, while promoting heart health and weight control.

8. High-Protein Diet:

- Key Foods: Lean meats, eggs, legumes, tofu, quinoa, and Greek yogurt.
- Benefits: Helps build lean muscle, boost metabolism, and support weight loss while keeping skin firm and healthy.

10.*Blue Zone Diet:

- Key Foods: Beans, vegetables, whole grains, nuts, and olive oil (limited animal products).
- Benefits: Based on the eating patterns of the longest-living people, this diet promotes longevity and supports a healthy weight.

These diets are rich in whole, unprocessed foods that support overall wellness by promoting skin health, reducing inflammation, and maintaining a healthy weight—all essential components for anti-aging.

By making mindful dietary choices, individuals can not only extend their lifespan but also enhance their health span—the period of life spent in good health, free from chronic disease and disability. The key to using nutrition for healthy aging is to focus on a balanced and varied diet. Choosing foods rich in antioxidants, healthy fats, proteins, vitamins, and minerals can help slow down the aging process and keep you healthy for longer.

Summary

Diet and nutrition play a crucial role in aging by influencing longevity, health, and the prevention of age-related diseases. Nutrient-rich, balanced diets reduce oxidative stress and inflammation, slowing cellular damage. Consuming antioxidant-rich and protein rich foods supports healthy aging. Proper nutrition enhances overall vitality, promotes longevity, and improves quality of life as we age.

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CHAPTER

Fourteen

Rehabilitation Therapy

What is rehabilitation therapy?

Rehabilitation therapy is a multidimensional approach consisting of several forms of therapies which focus on improving the quality of life and functional abilities of an individual. These therapies improve overall wellbeing, promote good health, prevent diseases, and are used as treatment and palliative care. Which means incorporating these therapies can help in healthy aging and slowing down the discomforts of aging.

These therapies are namely, physiotherapy, occupational therapy, speech therapy, psychological therapy amongst others.

Role of rehabilitation therapy in anti-aging?

Aging is often associated with physical degeneration and functional limitations. Age related conditions like osteoporosis, injuries, surgeries, lack of mobility, frailty, muscle and joint stiffness often result in movement restrictions thereby affecting the functional independence.

Physical therapy manages these challenges and improves mobility, maintains bone density, improves endurance, strength and flexibility, reduces pain, and enhances overall quality of life. It helps one remain agile and physically strong.

Occupational therapy improves fine motor activities and grip which get affected with age. Therapists suggest modifications which can make daily activities easy and pain free.

Psychological therapies help improve mental health of individuals making them less susceptible to anxiety, depression and nervousness. With help of different tools, they help enhance the cognition and memory which often gets weaker with age. These therapies focus on improving overall emotional and mental wellbeing of the individuals. Psychological therapy can help people age well by providing a safe space to explore and respond to the many changes and losses that come with aging.

Speech therapy works extensively with individuals facing age-related progressive disorders such as Alzheimer's, Parkinson's, and Dementia, which often result in speech impairments. It can help with speech, language, communication, and swallowing disorders. Aesthetic speech therapy, also known as myofunctional speech therapy, is a type of treatment that can help with facial rejuvenation.



Spine and Joint Rehabilitation

Restricted spine and joint movements is one of the most common signs of aging. As we age, the skeletal system undergoes many changes including bone loss, decreased muscle mass, and flexibility, making adults more susceptible to conditions like osteoporosis, fractures, degenerative disc disease, and spinal stenosis. These age-related issues can result in pain, reduced mobility, and a decreased quality of life. Rehabilitation therapies focussing on joint and spine health have shown to help ease these issues.

1. Physiotherapy:

This therapy mainly focuses on improving movement and functional ability of the individuals. It consists of strengthening exercises, balance training, mobilizations, including slow stretches of ligaments and tendons, electrotherapy and muscle release techniques. The goal of physical therapy is to address pain, improve range of movement, posture correction, reduce risk of falls, improve functional mobility and accelerate healing.

Treatment Program Goals

- **Gentle Movement:** Specific gentle movements help to take pressure off the nerve root, which can help reduce pain.
- **Stretching and Range-of-Motion Exercises:** Specific exercises to improve mobility in the joints and muscles of spine and extremities help improve range of motion in a joint which is often the key to pain relief.
- **Strengthening Exercises:** strengthening abdomen and back muscles provide support for the spinal joints, and strong arm and leg muscles help take some of the workload off your spinal joints.
- **Aerobic Exercise:** Aerobic exercise movements increase tolerance for activities that might have been affected by spinal stenosis, such as walking.

Along with physical exercises, physiotherapists use a combination of treatments including

- Manual Therapy such as massage to improve the mobility of stiff joints
- Use of rehabilitation equipment such as a special harness device that attaches to a treadmill to help reduce pressure on the spinal nerves during walking.
- Postural Education to relieve pressure on the nerves by making simple changes in how you stand, walk, and sit.
- Interferential therapy, a non-invasive treatment that uses low-frequency electrical currents to treat pain and repair tissue. It's also known as transcutaneous electrical stimulation.
- Extracorporeal shockwave therapy which uses sound waves to stimulate blood flow,

break up calcium deposits, and speed up healing.

Electrical muscle stimulation (EMS) which uses low faradic currents to stimulate nerve endings and cause muscles to contract and relax.

Electrotherapy which can mitigate pain, stimulate blood circulation, and generate deep tissue congestion.

Occupational Therapy:

Occupational therapy is a type of rehabilitation therapy that mainly focuses on fine motor activities and assists individuals to become independent and suggests suitable modifications to enhance participation in everyday tasks. Through small adjustments to daily activities and the promotion of good ergonomics, many physical comorbidities, such as Arthritis, Low Back Pain, and fatigue associated with aging can be prevented.

Occupational therapists can help individuals with spine and joint pain by

- Improving their sitting, standing walking posture
- Modify activities to make them easier
- Suggesting use of assistive devices to make tasks easier and relieve pain
- Improve mobility and function by prescribing a range of adaptive strategies, such as joint protection techniques and work/rest routines
- Managing pain using different specialised strategies
- Therapists can teach people coping strategies and educate them about their condition
- Suggest strategies to improve ergonomics at work making it more comfortable and pain free.

Aquatic Therapy

Aquatic therapy is defined as use of water and its chemical and physical properties to perform specifically designed activity given by qualified personnel to aid in the restoration, extension, maintenance and quality of function for persons with acute, transient, or chronic disabilities, syndromes or diseases.” It is commonly known as Water Therapy and is a structured rehabilitation process performed in water under the guidance of trained and practicing therapists. It is one of the widely used treatment modalities for neurological and musculoskeletal conditions.

Aquatic therapy can help with joint rehabilitation in many ways, including:

- Reducing pain by increasing blood flow to sore muscles, which can help with pain relief.
- Improving range of motion. The buoyancy of water reduces the weight on your joints, making it easier to move and exercise.

- Increasing muscle strength. Water is more resistant than air, so moving your joints against the water can help strengthen muscles.
- Improving balance. The uniform pressure of water provides support, which can help you react without fear of falling.
- Reducing swelling. The hydrostatic pressure of water can help reduce swelling.
- Correcting muscle imbalances. Aquatic therapy can help correct muscle imbalances.
- Improving coordination

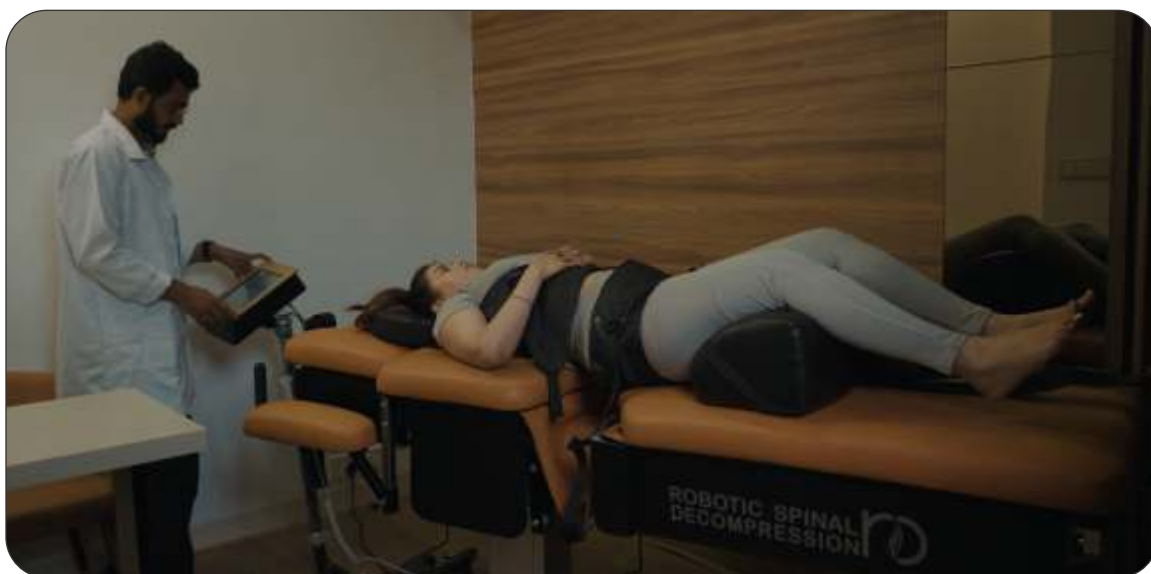
Some Rehabilitation modalities used in KLS Wellness Institute:



Robotic Spinal Decompression

Introducing the RSD-4D, the latest innovation in our spine rehabilitation unit, designed to transform how we approach spinal care. This groundbreaking robotic spinal decompression system is not just another treatment; it represents a true non-surgical, four-dimensional solution specifically engineered to alleviate pain and discomfort associated with various spine and disc issues in both the neck and lower back.

Imagine a treatment that targets specific conditions such as Herniated Discs, Bulging Discs, Degenerative Disc Disease, and protruding discs with unparalleled precision. The RSD-4D provides targeted spinal decompression that adapts to your unique needs. With separate programming for lumbar and cervical decompression, this system allows for adjustments in a three-dimensional plane—flexion, extension, side flexion, rotation, and distraction—ensuring that each session is tailored to provide optimal relief.



What sets the RSD-4D apart is its advanced motorized control combined with a computerized cockpit that guarantees precise and safe treatment. The integration of RFDT (Robotic Flexion Distraction Therapy) and RDMT (Robotic Dynamic Mobility Therapy) utilizes robotic control for both passive flexion-distraction and dynamic mobility therapy. This dual approach effectively addresses symptomatic relief while promoting therapeutic benefits.

The cockpit screen enhances repeatability of treatments while real-time digital tracking ensures every session is as effective as possible. User-defined settings allow practitioners to customize each experience further based on individual patient needs. Plus, setup is simple—no cumbersome ropes or pulleys are required—making it easier than ever to incorporate manual techniques alongside traction for comfortable therapy.

In a world where back pain can significantly impact quality of life, the RSD-4D offers hope through advanced technology that prioritizes patient comfort and recovery. Don't let spine issues hold you back any longer; consider how robotic spinal decompression could be your pathway to lasting relief!

Combining Virtual Reality And Robotic Technology

Blending Virtual Reality and robotic technology increases engagement and enhances the recovery journey. It integrates objective assessment for ROM, strength, speed and reaction time to precisely progress tracking. It offers various assistive modes, personalized rehabilitation experiences to individual needs, promoting active participation and accelerating transition to



active movements. It also provides versatile resistance settings like isotonic, isometric, isokinetic, and elastic settings. It caters to diverse rehabilitation needs, enabling clinicians to customize strength training programs effectively. It introduces gamification into exercises, elevating user engagement and compliance. This innovative approach makes rehabilitation enjoyable and motivating. Beyond physical recovery, It also contributes to cognitive training, recognizing the integral role cognition plays in overall well-being. It simulates real-life scenarios through 3D activity simulation, embedding activities of daily living (ADL) into exercises, promoting functional independence in users' day-to-day lives.

Pulse Wave Shock Therapy

Extracorporeal ShockWave, also called Acoustic Wave Therapy, is a radial shockwave device which uses the body's intrinsic repair mechanisms to regenerate the tissue. The application of the focused acoustic wave therapy results in transient cellular membrane permeability, increasing blood flow in all tissue layers, including the connective tissue, through vasodilation and vascularization. This device is used to treat a variety of medical conditions, primarily those involving musculoskeletal pain and soft tissue injuries like Plantar Fasciitis, Tennis Elbow (Lateral Epicondylitis), Calcific Tendonitis, Achilles Tendinopathy, Patellar Tendinopathy (Jumper's Knee), Non-healing Fractures, Greater Trochanteric Pain Syndrome, Myofascial Pain Syndrome and Erectile dysfunction.

ITECAR

I TECAR stands for the spanish acronym 'Transferencia Electrica Capacitiva Resistiva', meaning Capacitive Resistive Electric Transference. It is a diathermy therapeutic modality, therefore it increases local body tissue temperature, in combination with subthermal application to promote the body's healing response. It can work in two modes of energy transfer:

- Capacitive mode: affects tissues with higher electrolytic content (soft tissues and muscles)
- Resistive mode: affects tissues with higher resistance (joint, bone, tendon)

TECAR®'s main use in physiotherapy relates to the rehabilitation of musculoskeletal and pain disorders, and sport rehabilitation. It is used to treat Acute or chronic injuries / inflammation, Low back pain, Muscle spasms, Joint pain, Synovitis, Tendinopathy, Post-surgical, Osteoarthritis.

CLASS IV LASER

Class IV deep tissue laser therapy is a non-invasive, painless, and highly effective way to treat a variety of conditions. It uses a high-powered laser to penetrate deep into the tissue and stimulate healing at the cellular level. Class 4 laser therapy stimulates the production of ATP (adenosine triphosphate) which drives many of the processes within our cells. This increased production of ATP helps speed up the healing process within cells. Laser therapy uses specific wavelengths of light (red and near-infrared) to create therapeutic effects that

help provide relief to symptoms including pain, swelling, and limited range of motion. A class 4 laser increases tissue regeneration which helps in healing of the tissues and also accelerates soft tissue and bone repair. This kind of laser therapy can also improve nerve regeneration & function as well as impact your cells to increase cell metabolism, enzymatic responses, collagen production, and promote angiogenesis.

Combo Machine For Electrotherapy

COMBO UNIT features a Stimulator and Ultrasound in a portable unit. Chattanooga electrotherapy machines are considered a gold standard for clinical electrotherapy and are considered to be one of the best electrotherapy machines worldwide.

Waveforms available:

- (a) VMS: VMS (Variable Muscle Stimulation) is a type of waveform used in Chattanooga electrotherapy devices to stimulate muscles:

VMS uses a symmetrical biphasic waveform with adjustable frequency, phase duration, and inter-phase intervals.

Delivery: VMS can be delivered continuously or in bursts, depending on the therapeutic goals and target tissue.

Benefits: VMS can increase muscle contraction forces, reduce fatigue, enhance local circulation, and improve patient comfort.

Uses: VMS can be used for rehabilitation and performance enhancement.

(b) IFT

Interferential therapy utilizes two medium frequency currents, passed through the tissues simultaneously, the electrodes are placed in such a way that paths cross current interfere with each other. This interference gives rise to a beat frequency which has the characteristics of low frequency stimulation. IFT can be used to administer larger areas. It helps in pain relief, muscle stimulation, increase local blood flow and reduction of edema.

© TENS

TENS is a simple, non-invasive technique for pain relief. During TENS, pulsed currents are generated by a pulse generator (TENS machine) and delivered across the intact surface of the skin through electrodes. TENS selectively activates large diameter 'touch' fibers which helps in pain relief. It helps in acute and chronic pain.

(d) Ultrasound

Ultrasound refers to mechanical vibrations, which are essentially the same as sound waves but of a higher frequency. Such waves are beyond the range of human hearing and can therefore be called ultrasonic. The frequencies used in therapy are typically between 1.0 and 3.0 MHz.

Ultrasound is applied using the head of an ultrasound probe that is placed in direct contact with the skin via a transmission coupling gel. It is used for treatment of smaller or localized areas. It helps in tissue relaxation, tissue heating, local blood flow, healing rates and scar tissue breakdown.

Summary

Rehabilitation therapy in anti-aging focuses on incorporating physiotherapy, occupational therapy, psychological intervention, speech therapy, aquatic therapy, etc to improve strength, endurance, and flexibility, which counteracts age-related deterioration.

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CHAPTER *Fifteen*

Regenerative Medicine

What is regenerative medicine?

Regenerative medicine may be defined as the process of replacing or "regenerating" human cells, tissues or organs to restore or establish normal function. It is a field of medicine that uses the body's natural healing processes to repair and regenerate damaged tissues and organs. They mainly involve use of healthy cells to carry out the repair process. These cells are capable of proliferation and differentiation, regulating tissue repair and immune processes.

Role of Regenerative medicine in Anti-aging

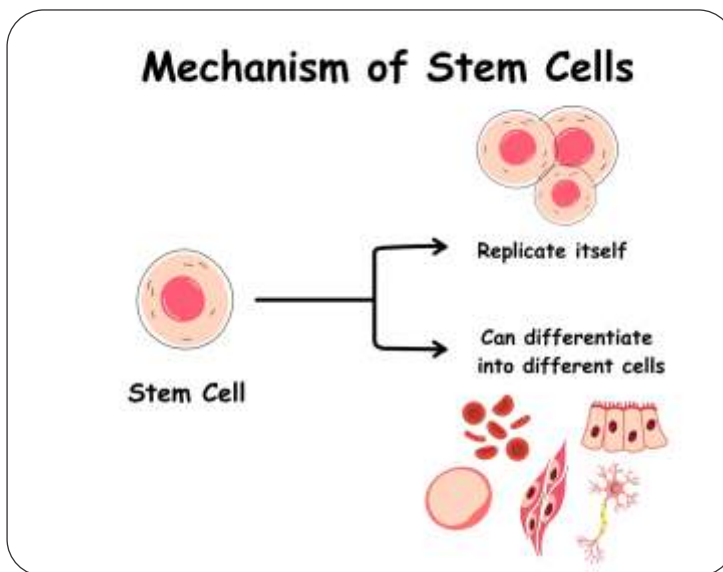
Aging is a natural biological process in which the structures and functions of organs decline over time. Cellular senescence is considered to be a potential contributor to the age-associated loss of regenerative potential of the body's cells. The main characteristics of senescent cell damage include mitochondrial dysfunction; impaired immune function; accumulation of damaged proteins (impaired proteostasis) and somatic and mitochondrial DNA mutations; aberrant intracellular communication; telomere shortening; and alteration of autophagy, epigenetics, and nutrient sensing. Together these contribute to

development of age related disorders such as including cancer, diabetes, osteoporosis, cardiovascular diseases, and neurodegenerative disease.

Recently, regenerative medicine has gained a lot of interest as an anti-aging modality. Some techniques of regenerative therapy include cell therapy and Platelet-rich plasma (PRP) therapy:

Cell therapy which includes use of undifferentiated cells has shown to slow or even reverse to some extent the physiological and pathological aging. These undifferentiated cells when injected into the body migrate to the damaged tissues, multiply, differentiate and replace the damaged cells. They also stimulate the nearby cells for cellular regeneration and delay cell death. They secrete several chemicals/ molecules such as growth factors and cytokines which help reduce inflammation, modulate the immune system, and protect against oxidative stress. All these mechanisms together help in rejuvenation and slowing down the natural process of aging where the cells lose their regenerative properties and eventually prevent age-related diseases.

Different cell types are used for cell therapy which include adult cells including bone marrow derived cells, adipose tissue derived cells, umbilical cord blood cells, etc. All these cells have unique regenerative potential. However adult cells are the most widely used owing to its safety, feasibility and easy availability.



Platelet-rich plasma (PRP) therapy

Cell Therapy for Age related disorders

Currently, the age related disorders for which adult cells especially bone marrow derived cells are used are Dementia and Brain Stroke.

(a) Role of Cell therapy in Dementia:

Bone marrow-derived cells are being used in dementia particularly due to their regenerative capabilities and ability to modulate inflammation. The main mechanism of action includes:

- **Neuroprotection:** cells may help protect neurons from damage through the release of neurotrophic factors, which support the survival and growth of neurons.
- **Inflammation Modulation:** cells have anti-inflammatory properties that could reduce neuroinflammation, a common feature in dementia, particularly Alzheimer's disease.
- **Neurogenesis:** Cells can differentiate into neuronal-like cells or support the regeneration of existing neurons, contributing to cognitive function improvement.

Scientific Studies have shown that cell therapy in dementia has a positive beneficial effect as it leads to improvement in cognition, memory, logical thinking, concentration, attention, reasoning and visuo-spatial skills such as perception, depth and mathematical calculations. It also helps slow down the natural progression of the disease and makes the patient independent in performing their activities of daily living.

(b) Role of Cell therapy in Brain Stroke:

Bone marrow-derived cells are being used in brain stroke for their therapeutic and regenerative potential. Their mechanism of action includes:

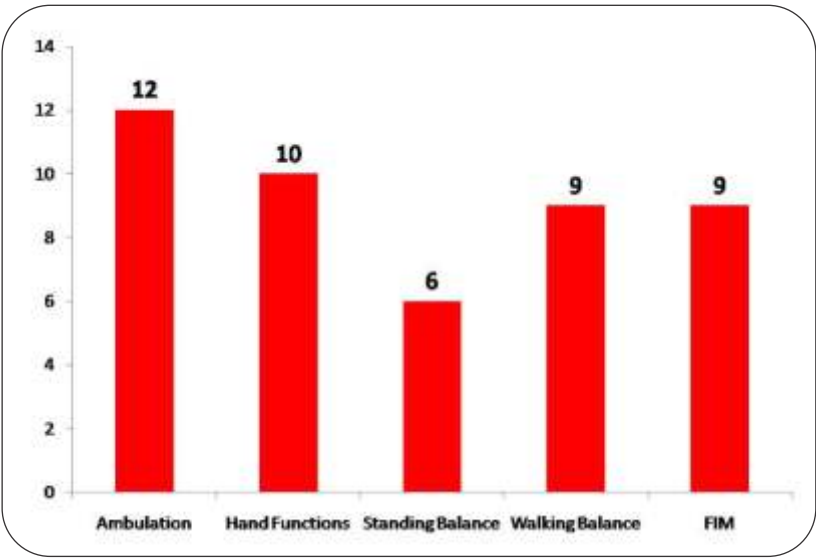
- **Neuroprotection:** bone marrow derived cells can release neuroprotective factors that help to safeguard neurons from damage during a stroke. This may reduce cell death and promote recovery.
- **Tissue Repair and Regeneration:** bone marrow derived cells can differentiate into neuronal and glial cells, potentially contributing to the regeneration of damaged brain tissue. They may also stimulate endogenous repair mechanisms.
- **Anti-Inflammatory Effects:** bone marrow derived cells have anti-inflammatory properties that may help to reduce secondary brain injury caused by inflammation following a stroke.
- **Angiogenesis:** These cells can promote the formation of new blood vessels (angiogenesis), which is crucial for restoring blood flow to ischemic areas of the brain.
- **Cell Signaling:** They can secrete a variety of cytokines and growth factors that promote cell survival, migration, and differentiation, aiding in the recovery process.

The therapeutic benefits of cell therapy in brain stroke include improvement in standing, sitting and walking balance, ambulation, speech and swallowing, muscle tone and voluntary control, cognition, memory and hand functions, Patients show significant improvement in functional independence and are able to perform daily activities.

Improvements are also recorded in the brain metabolism of the stroke patients after cell therapy.

Sharma et al published a clinical study consisting of 24 brain stroke patients who underwent intrathecal administration of autologous bone marrow mononuclear cells.

Out of 24 patients, 12 improved in ambulation, 10 in hand functions, 6 in standing balance, and 9 in walking balance. Patients with age less than 60 years showed a higher percentage of improvement in the areas of ambulation, hand functions, and sitting and standing balance, as compared to the patients with age more than 60 years. They also showed improvement in the Functional independence measure (FIM) scores. The percentage of improvement was higher in patients, whose stroke was less than 2 years old, as compared to those patients whose stroke was older than 2 years. Patients with ischemic type of stroke had better outcomes in all the mentioned areas, as compared to those with hemorrhagic stroke. Also, patients with right brain involvement showed higher percentage of improvement in area of ambulation, standing balance, and walking balance, as compared to the left brain. There was a statistically significant difference < 0.05 seen in FIM scores before and after the cell therapy.



Graph representing symptomatic improvements in patients with brain stroke after cell therapy. (N=24)

Use of Cell Therapy in Diseases that mimic accelerated aging

Several diseases and conditions can mimic accelerated aging, presenting symptoms and characteristics commonly associated with the aging process. Their symptoms are similar to those seen in normal aging, but are presented at an early age. These diseases include Amyotrophic Lateral Sclerosis and Duchenne Muscular Dystrophy. Below we'll discuss in detail how cell therapy using bone marrow derived cells have beneficial effects in treatment and slowing down of progression of these conditions

(a) Amyotrophic Lateral Sclerosis (ALS)

Amyotrophic Lateral Sclerosis (ALS) is a form of Motor neuron disease (MND) which is

characterized by fast progression, weakness of the muscle, and presence of both Upper and Lower Motor Neuron symptoms in the trunk, limbs and bulbar regions (wherein speech, swallowing and respiratory functions are affected). The life expectancy of patients with ALS is very poor of up to 3 to 5 years since the onset of the disease. The onset of the disease may be from weakness in the limbs or bulbar region. As the disease progresses the weakness spreads to all the regions of the body. The terminal symptoms of the disease are caused due to weakness of respiratory muscles leading to respiratory insufficiency and eventually respiratory failure. ALS significantly hampers the quality of life of patients due to increased dependence for performing activities of daily living as the disease progresses.

Role of cell Therapy in ALS

Neuroprotection: Bone marrow cells may release neurotrophic factors that help protect motor neurons from degeneration. These factors can promote cell survival, reduce apoptosis, and enhance neuronal health.

Anti-Inflammatory Effects: Bone marrow cells can modulate the immune response and reduce neuroinflammation, which is often present in ALS. By dampening inflammation, stem cells may create a more favorable environment for neuron survival.

Cell Replacement: Bone marrow cells have the ability to differentiate into motor neurons which may replace lost or damaged neurons directly. This could restore some function in the affected motor pathways.

Support of Endogenous Repair Mechanisms: These cells may enhance the body's natural repair mechanisms by promoting the activity of resident neural stem cells and facilitating tissue regeneration.

Angiogenesis: These cells can promote the formation of new blood vessels, improving blood supply to damaged areas and supporting neuronal health.

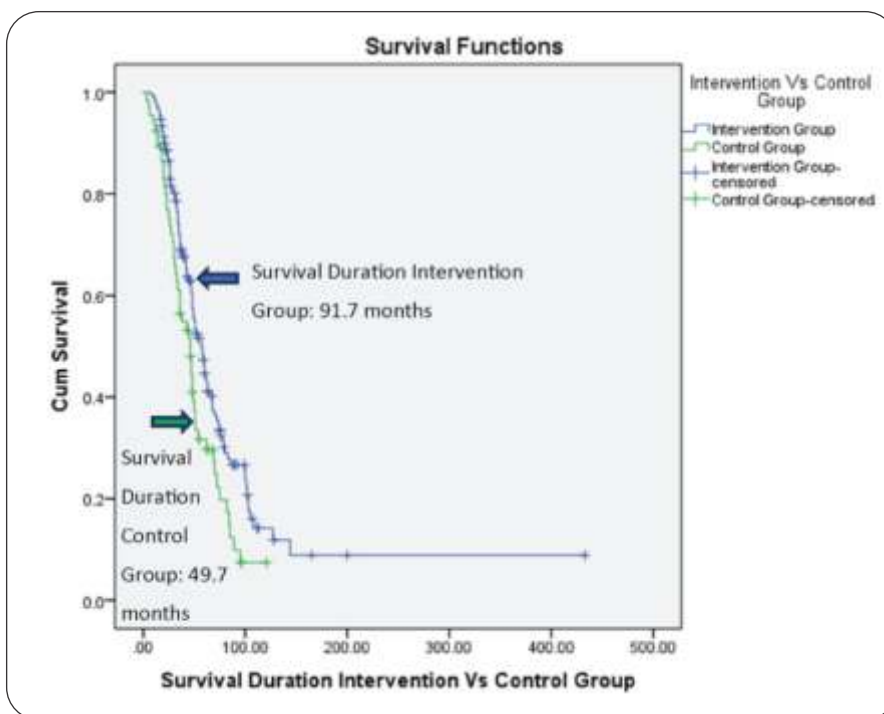
Secretion of Paracrine Factors: They can secrete a variety of chemicals that promote tissue repair and regeneration, influencing surrounding cells and the local microenvironment.

Modulation of Glial Cells: They may interact with glial cells (such as astrocytes and microglia), which play critical roles in supporting neurons and regulating inflammation. This interaction can help restore balance in the neuroinflammatory processes associated with ALS.

Sharma et al has published a series of clinical studies with long term follow up to demonstrate the positive effect of autologous bone marrow mononuclear cells in ALS. They reported that after treatment the patients survive for a longer duration as compared to the patients who have not received treatment.

In their retrospective, controlled study which evaluated the effect of cell therapy over a span of 10 years 5 months, 216 patients of ALS were included. Out of these 150 received cell therapy while 66 were in the control group who received only standard treatment. None of the patients reported any major adverse events related to cell administration or the

procedure. Survival duration in the intervention group was 91.7 months while 49.7 months in the control group, i.e. there was a difference of 42 months. Within the intervention group, estimated survival was significantly higher in patients with limb onset (102.3 months) vs. bulbar onset (49.9 months); premenopausal women (93.1 months) vs. postmenopausal women (57.6 months); and preandropausal men (153.7 months) vs. postandropausal males (56.5 months). They concluded that autologous BMMNCs along with standard treatment offers a promising and safe option for ALS with the potential of long term beneficial effect and increased survival.



Kaplan–Meier graph showing comparison of the estimated survival duration in intervention and control groups. Mean estimated survival duration was 91.7 months in the intervention group while in the control group it was 49.7 months.

Duchenne muscular dystrophy (DMD)

Duchenne muscular dystrophy (DMD) is a genetic disorder characterized by rapid progressive muscle degeneration and weakness. It affects approximately 1 in 3,500-5,000 live male births. There are deletions and duplications in the gene on the X chromosome that makes dystrophin which is responsible for muscle functions. In DMD, the lack of functional dystrophin leads to muscle degeneration, weakness, and eventual loss of mobility. The absence of dystrophin disrupts the protective mechanism of muscle fibers, resulting in damage during physical activity.

Repeated cycles of degeneration and regeneration also cause the muscle stem cell pool to be either exhausted or to lose their capacity to regenerate and result in the muscles to be

replaced by adipose and fibrotic tissue. Affected children become wheelchair dependent by 10-12 years of age and their life span is not more than 20 years.

Role of cell therapy in DMD:

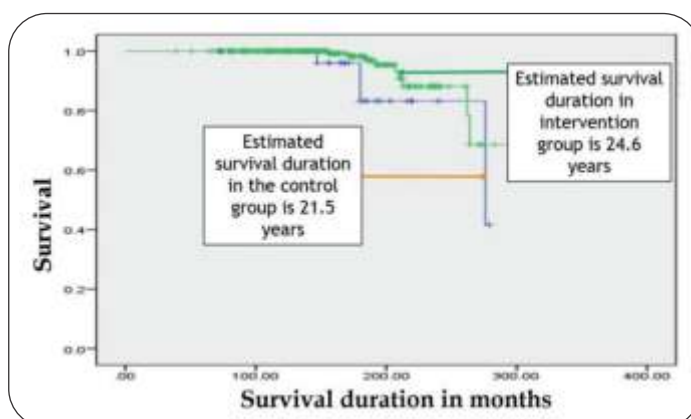
Cell therapy has shown promising results in not improving the symptoms in DMD but also slow down the disease progression and extend the child's ambulation.

Their mechanism of action involves:

- Bone marrow cells have the ability of self-renewal and migration to the site of damage/injury and carry out repair and restoration processes.
- They divide and differentiate to replace the damaged and dead cells.
- They restore dystrophin expression in duchenne-skeletal muscle cells.
- They halt further muscle damage by exerting paracrine mechanisms and stimulate endogenous cells to carry out repair processes.
- They secrete various cytokines and chemokines exerting anti-inflammatory, anti-apoptotic, angiogenic and immunomodulatory effects.

Sharma et al, conducted a study on 296 patients with DMD who underwent autologous transplantation of bone marrow mononuclear cells by intrathecal and intramuscular routes. There were no major side effects. 55 patients formed the control group who only received standard treatment for DMD. On a follow-up of an average 18 months, 76% patients showed symptomatic and functional maintenance and/or improvements. They also reported increased survival duration of DMD patients who underwent the treatment by 37 months as compared to the control group. Patients in the cell therapy group retained their ambulation for 13 months more than the control group.

The increase in survival duration, time to loss of ambulation, time to lose the ability to self-feed and slower deterioration of muscle strength, indicate decline in the rate of disease progression due to cell therapy.



Kaplan Meier graph showing comparison of estimated survival duration of the intervention and control group. There is a difference of around 3.1 years (37 months)

Platelet Rich Plasma Therapy:

PRP therapy involves injecting a patient's own plasma into specific areas to regenerate cells and reverse signs of aging.

PRP is a mixture of the patient's own blood plasma with a high concentration of platelets. Platelets naturally circulate in the blood and help blood to clot as well as release growth factors and proteins that promote healing. PRP injections help combat senescence and inflammation, reduce pain as an analgesic, promote tissue regeneration and repair via angiogenesis. PRP has been used as an anti-aging treatment option for many dermatological applications. It helps in reducing wrinkles, skin sagging and improved skin complexion. It also helps in hair growth. Along with skin and hair applications, PRP is also used to treat osteoarthritis as it can reduce pain, inflammation and improve joint function without being too invasive.

At KLS Wellness Institute PRP is used as anti-aging modality for skin and hair.

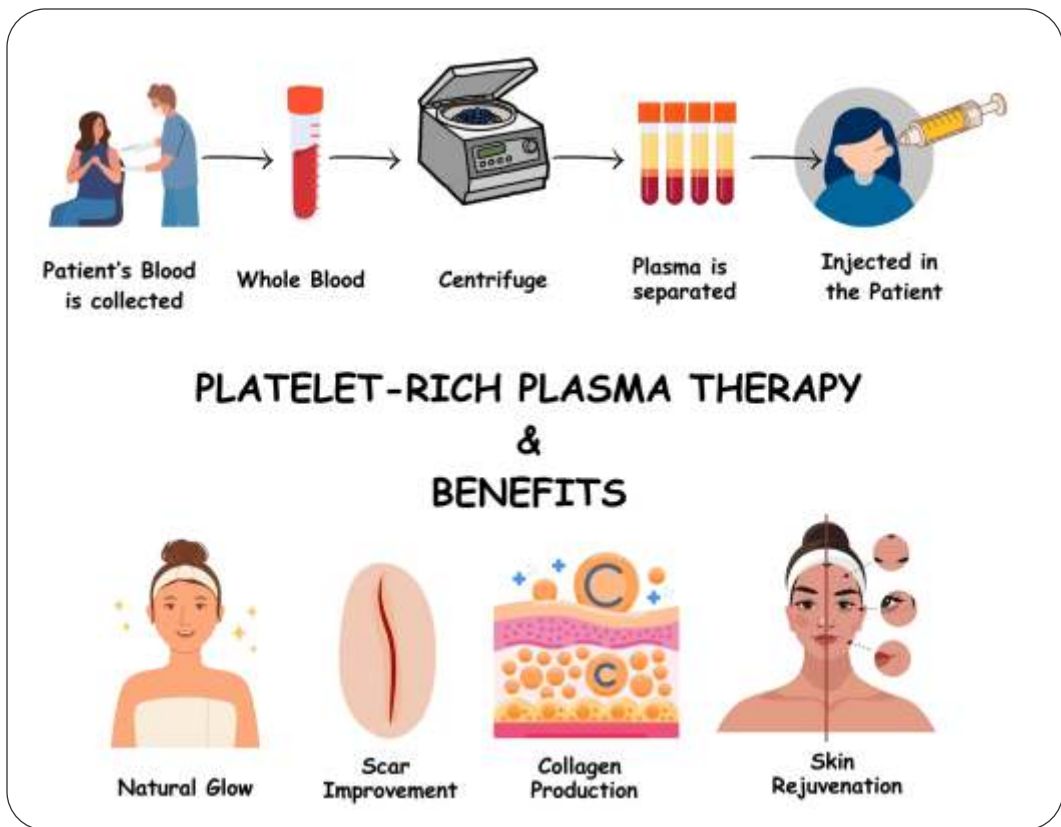
- (a) **For Skin:** PRP facial triggers collagen production and, via micro-needling, it improves skin tone and texture. PRP is prepared from the individual's own blood by processing it in a centrifuge.

There are several ways to get the PRP facial. It can be done by either spreading the plasma on the face, after which micro-needling is performed across the face or by simply injecting PRP at various areas of the face at 1 cm distance. Both the micro-needling and the PRP stimulate collagen growth. Hence it is effectively used to treat wrinkles, fine lines, crow's feet, sun damage, open pores, post inflammatory or post acne scars, pigmentation, etc. This facial is also called a vampire facial.

The PRP procedure is safe but may have temporary side effects that include pain, swelling, or bruising after the procedure that goes away in a few days. Other possible side effects may be a result of incorrect handling. The facial involves drawing blood and pricking the skin, so serious complications like infection, scarring, and bleeding can occur if done incorrectly. The PRP facial equipment needs to be sterile to reduce the risk of contracting blood-borne illnesses.

- (b) **Hair PRP therapy:** It is a non-surgical treatment offered at KLS Wellness Institute that promotes hair growth and addresses hair thinning by using the body's own healing properties. The procedure involves drawing a small amount of the patient's blood, which is then processed to separate and concentrate the platelets. These platelets, rich in growth factors, are injected into the scalp at targeted areas to stimulate hair follicles, improve hair density, and enhance overall hair health. Hair PRP is commonly used to treat conditions like androgenic alopecia (pattern baldness) and hair thinning due to stress or hormonal changes.

While generally safe and minimally invasive, the treatment may have mild side effects such as temporary scalp tenderness, swelling, or redness. However, it is considered a low-risk procedure with no downtime, making it an effective and convenient solution for those seeking natural hair rejuvenation.



Summary

Cell therapy mainly involves use of healthy cells to carry out the process of repair and regeneration. It helps in treating age related diseases like Dementia and Brain Stroke and diseases that mimic accelerated aging like Amyotrophic Lateral Sclerosis (ALS) and Duchenne Muscular Dystrophy.

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CHAPTER

Sixteen

Therapies for Microcirculation

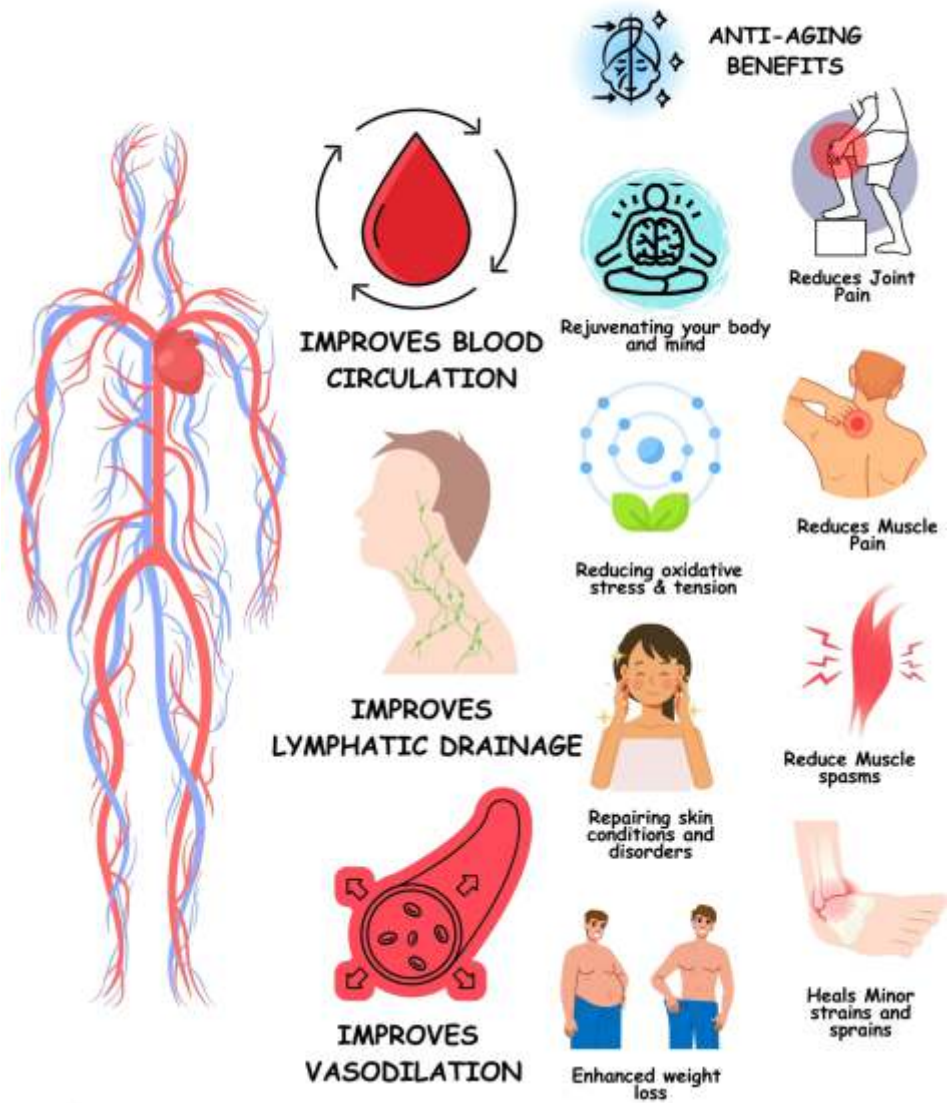
Apart from the treatments discussed in the previous chapters there are other therapies which work alone or in combination for slowing the process of aging and improving overall wellness. These treatments aid in improving microcirculation, lymphatic circulation, detoxification and aid in relaxing and rejuvenation.

At KLS Wellness Institute, specialised treatments such as AVACEN therapy, Prism Light Pad, Flow Presso Lymphatic Drainage Therapy, Infrared Sauna are advised to patients as a part of the anti-aging treatment

AVACEN® therapy:

AVACEN stands for Advanced Vascular Circulation Enhancement. It is a drug-free, noninvasive, over-the-counter heat therapy system which enhances the microcirculation in the body. It utilizes a unique medical device that combines heat therapy with negative pressure to enhance microcirculation. Microcirculation is crucial to the functioning of the whole body. Its primary goal is to facilitate the delivery of oxygen and nutrients to the tissues, adjust blood flow and to remove byproducts of metabolism. It balances between the oxygen delivery and demand. This delicate balance can play an important role in the

Therapies for Microcirculation



progression of critical illnesses and has a role in the development of organ dysfunction.

Microcirculation impairment begins in adulthood and worsens with age. This can lead to internal organs and tissue systems being unable to function normally, which contributes to aging.

How does AVACEN work?

The procedure involves placing the hand in an enclosed special patented mitt, which is placed inside the vacuum chamber, negative pressure and heat are applied to safely

increase the temperature and blood volume flowing through high volume arteriovenous anastomoses (AVAs). This enhances microcirculation. An increase in microcirculation enhances oxygen delivery and nutrition to the skeletal muscles while carrying away carbon dioxide and waste. The result of this is healthier, more relaxed muscles throughout the entire body. It improves local circulation in muscle tissue in as little as 20 minutes of treatment, facilitating and improving microcirculation throughout the entire body.

Benefits of AVACEN in age related symptoms:

- Reduced muscle and stiffness
- Reduced Joint pain and stiffness
- Relief from Muscle spasms
- Relief from strains and sprains
- Muscle relaxation
- Temporary increase of local circulation

(2) Flow Presso Lymphatic Drainage Therapy

FLOWpresso® is a breakthrough non-invasive natural therapy that delivers a 3 in 1 sensory treatment; compression, far infrared heat and deep pressure therapy. It is used to enhance blood and lymphatic flow, improve cellular function and energy, as well as support relaxation and sleep.

Lymphatic system is a group of organs, vessels and tissues that protects us from infection and maintains a healthy balance of fluids throughout the body. Fluid that is forced out of the bloodstream during normal circulation is filtered through lymph nodes to remove bacteria, abnormal cells and other matter. This fluid is then transported back into the bloodstream via the lymph vessels. Lymph only moves in one direction, toward the heart. When this system is compromised, there is a collection of fluid causing swelling and edema.

Aging induces changes in structure and function of lymphatic networks affecting the process of lymphatic drainage. Lymphatic-related diseases are prevalent in elderly, such as lymphedema, inflammation, cancer, etc which are caused due to age-related tissue dysfunction and deterioration. Aging associated alterations affect the pump efficiency of the lymphatic vessels which result in excessive retention of tissue fluid within interstitial spaces. Reduced responsiveness to inflammatory stimuli in aged lymphatic vessels decreases the normal capacity to react against foreign organisms.

Lymphatic drainage is essential for detoxification, immune function, maintaining fluid balance, nutrient absorption, and reducing swelling and pain. Its efficiency is directly linked to overall health. Since lymphatic drainage is impaired with age these functions are eventually affected.

How does Flow Presso Lymphatic Drainage Therapy work?

Flowpresso harnesses the power of unique sequential compression, expertly designed to replicate the natural function of the lymphatic system. This innovative approach not only enhances lymphatic drainage but also promotes a harmonious balance within, unlocking a



myriad of health benefits. Flow Presso therapy is designed to promote deep relaxation, detoxification and rejuvenation. The Flow Presso cuffs are applied to targeted areas like both legs, both arms, abdomen, and back, using inflatable garments that provide gentle, rhythmic compression. It employs lower pressure and slower cycles of compression and decompression along with imparting infrared heat to the applied area. This soothing approach encourages lymphatic drainage, reduces stress, helps alleviate muscle tension and promotes relaxation. Sessions typically last for 40 minutes.

Benefits of Flow Presso Lymphatic Drainage Therapy:

Patients and clinicians have reported the following benefits:

- Increased relaxation
- Improved sleep quality
- Improved energy
- Decreased stress response

- Reduced swelling of arms and legs
- Faster recovery in sport
- Faster healing in health
- Better endurance in sport
- Weight loss
- Better mobility

(3) Infrared Sauna



An infrared sauna uses infrared heaters to emit infrared light experienced as radiant heat which is absorbed by the surface of the skin. This raises the core body temperature. While traditional saunas use heating elements such as hot stones and steam to raise the temperature of the air, infrared saunas use infrared light to generate heat. The infrared light penetrates the skin, deep into the muscles, cells, and tissue, raising body temperature and promoting detoxification.

The idea of a sauna is that this process mimics the effects of exercise and provides similar health benefits. The invisible infrared light waves emitted by these saunas gently heats the

body, allowing them to operate at lower, more comfortable temperatures than traditional saunas while still providing the same detoxifying, relaxing, and rejuvenating benefits. It is a safe and profoundly therapeutic experience.

How does Infrared Sauna work?

In an infrared sauna, infrared lamps emit radiant heat which penetrates the skin, muscles and tissues. This is effective because the human body, composed of about 70% water, can absorb infrared radiation efficiently. The interaction between the infrared wavelengths and the body's water molecules raises the core temperature, leading to sweating and detoxification.

This method of heating is significantly faster and more targeted than traditional saunas because it focuses on warming the body directly, rather than the surrounding air. This direct approach allows one to experience the benefits of heat therapy at lower temperatures, making the experience more comfortable.

Infrared saunas harness the power of radiant heat, delivered through infrared heaters using electromagnetic wavelengths ranging from 760 to 100,000 nanometers (nm). These wavelengths are designed to directly warm the body, targeting skin and underlying tissues for a more efficient and comfortable experience.

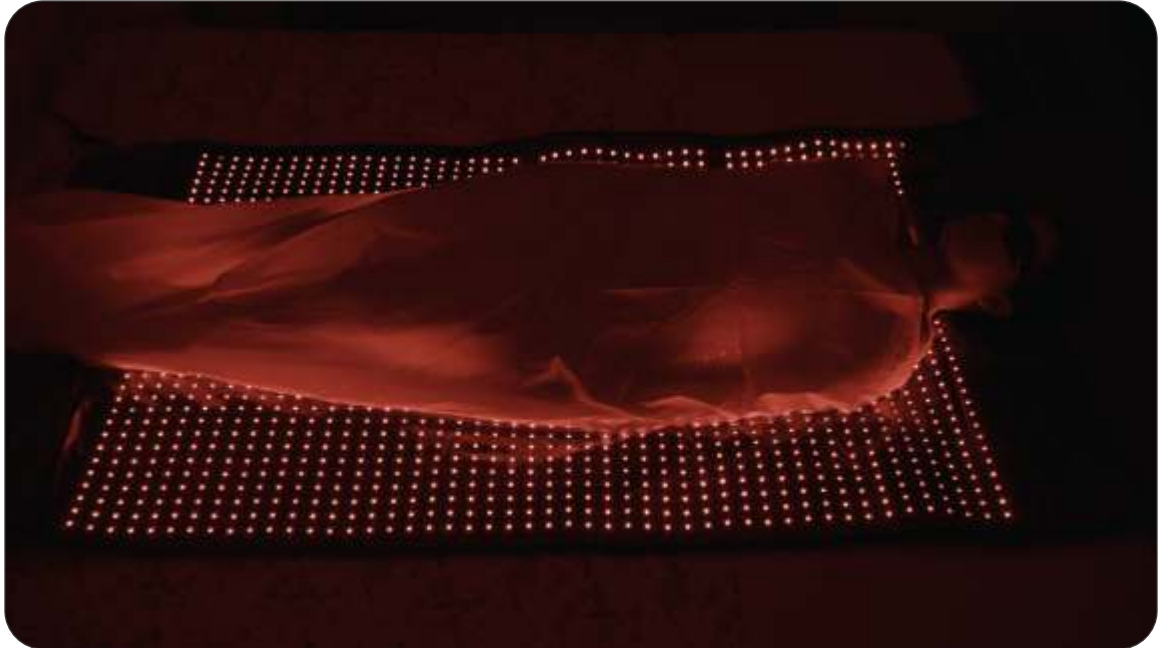
Benefits of infrared sauna in anti-aging:

- **Skin rejuvenation:** Infrared heat may also benefit people with certain skin conditions like psoriasis. It helps improve skin complexion by increasing production of collagen and elastin.
- **Detoxification:** It stimulates sweat glands, which helps the body eliminate heavy metals, chemicals, and other impurities.
- **Immunity:** It raises body temperature temporarily which can help body ward off infections.
- **Pain relief:** Infrared sauna therapy may ease the pain that comes with some musculoskeletal conditions, like low-back pain, osteoarthritis (degenerative joint disease), myofascial pain (pain within the musculoskeletal system), and fibromyalgia (pain throughout the body).
- **Stress reduction:** The improved circulation from dry heat therapy may promote relaxation and lower stress levels.
- **Cardiovascular health:** Increased body temperature helps dilate blood vessels and improve circulation. This can help reduce blood pressure and improve heart health.
- **Lung function:** One study suggests using a sauna might help improve breathing and reduce pneumonia risk, though more conclusive evidence is needed [4].

- Weight management: it speeds up the metabolism resulting in caloric loss and fat burn

(4) Prism Light Pad Therapy

The Prism Light Pad is a portable, full-body red light therapy device that uses red and near-infrared LED wavelengths to interact with the body's tissues, muscles, nerves, and ligaments and to promote wellness.



How does Prism Light Pad Therapy work?

Prism Light Pad therapy uses red light waves which penetrate into the body's cells, reducing inflammation and pain while speeding up the body's natural healing process up to 5 times. The red lightwaves target the mitochondria that is the powerhouse of cells in the body. By generating more energy cells can work more efficiently and improve cellular functions. It activates cellular healing to reduce inflammation and neuropathy throughout the entire body.

Benefits of Prism Light Pad Therapy

- Promote rejuvenation and relaxation
- Relieve muscle tension & pain
- Stimulating the lymphatic system
- Boosting the immune system and reduce inflammation
- Increase blood circulation to the tissue.
- Improve recovery,

- Improve skin health by increasing collagen production, skin repair, boost new cell growth and enhance skin rejuvenation.
- Treat skin conditions skin cancer and psoriasis, acne and warts, and other types of cancer.
- Promote anti-aging
- Improve aesthetics, help in weight management and whole body wellness.
- Provide relief from chronic conditions such as rheumatoid arthritis, osteoarthritis, multiple sclerosis, fibromyalgia, scleroderma, migraines, PTSD, and other conditions.

Precautions:

All the above mentioned treatments are safe and non-invasive. However, it is advised to take these therapies under supervision of experts and after discussing with the healthcare professionals in case of existing comorbidities.

Summary

Microcirculation is crucial to the healthy functioning of the body. Therapies like AVACEN therapy, Prism Light Pad, Flow Presso Lymphatic Drainage Therapy, Infrared Sauna help in improving microcirculation by facilitating oxygen delivery and nutrients to the tissues, adjust blood flow and to remove byproducts of metabolism. This further helps in better detoxification, relaxation and rejuvenation.

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CHAPTER

Seventeen

Other Innovative Approaches To Anti-Aging

As the quest for longevity intensifies, many other innovative strategies are being explored to combat the effects of aging. In this chapter, we will discuss in brief some of these promising approaches including enhancement of natural killer (NK) cells, peptide bioregulators, hormone oxytocin, plasmapheresis, taurine supplementation, and the benefits of epicatechin-rich cocoa. Each of these components offers unique mechanisms that may contribute to healthier aging and improved quality of life.

1. Enhancement of Natural Killer (NK) Cells

Natural killer (NK) cells are a type of lymphocyte in the immune system that play a crucial role in the body's defence against tumors and viral infections. They have the ability to identify and destroy abnormal cells, such as cancerous or virus-infected cells. They are part of the innate immune system, which means they provide a rapid response to pathogens and abnormal cells without the need for prior sensitization. Human ageing is associated with a decline in NK cell function.

Therefore, enhancement of NK cells can play a significant role in anti-aging through by contributing to immune function, tumor surveillance, and overall health. Some of the mechanisms are:

- **Immune Surveillance:** As we age, the risk of cancer increases due to the accumulation of mutations. NK cells help monitor and eliminate malignant cells, thus acting as a natural defense against cancer.
- **Infection Control:** The elderly often experience a decline in immune function, leading to increased susceptibility to infections. Maintaining robust NK cell activity can help control viral infections and other pathogens.
- **Regulation of Inflammation:** Aging is often accompanied by chronic low-grade inflammation (inflammaging). NK cells can produce cytokines that either promote or regulate inflammation, helping to balance immune responses and potentially reducing the harmful effects of chronic inflammation.
- **Tissue Repair and Regeneration:** Emerging research suggests that NK cells may have roles in tissue repair and regeneration, releasing growth factors that promote healing and recovery in damaged tissues.

Strategies to enhance NK cell function include lifestyle modifications such as exercise, nutrition or innovative therapies such as immunotherapies, cytokine treatments, help improve immune health and combat age-related decline.

2. Peptide Bioregulators

What Are Peptide Bioregulators?

Peptide bioregulators are small peptides that play essential roles in cellular communication, growth, and repair. They have been shown to influence various physiological processes, including hormone regulation and immune function. Certain peptide bioregulators may promote tissue repair and enhance the regenerative capacity of cells, making them promising candidates in anti-aging therapies.

(a) Cerebrolysin:

Cerebrolysin is a mixture of neuropeptides. It has been used for the treatment of stroke, brain injuries and various forms of dementia. Its potential role in anti-aging is being explored due to its ability to enhance neuroplasticity and neurorecovery and its neuroprotective and cognitive-enhancing properties. Here are some key aspects of cerebrolysin's role in anti-aging:

1. **Neuroprotection:** It has antioxidant properties that may help protect neurons from oxidative damage.
2. **Cell Survival:** It promotes cell survival pathways, which can be beneficial in combating age-related neurodegeneration.
3. **Cognitive Enhancement:** Cerebrolysin may improve cognitive functions, such as memory and learning in aging individuals.
4. **Neurogenesis:** Cerebrolysin may stimulate neurogenesis (the formation of new

neurons), which could help maintain cognitive function as we age.

5. **Restoration of Neurotransmitter Balance:** Cerebrolysin may help restore balance in neurotransmitter systems (like acetylcholine), which often decline with age, contributing to cognitive decline.
6. **Improvement in Blood Flow:** Cerebrolysin has been shown to improve cerebral blood flow, which is crucial for delivering oxygen and nutrients to brain tissue. Enhanced blood flow may support overall brain health and function in aging.

(b) Vesugen

Vesugen is a peptide that may help reduce the rate of aging by improving the activity of the central nervous system and other vital organs. Its mechanism involves:

- **Neuroprotection:** Vesugen is designed to support the repair and regeneration of nerve cells, potentially protecting against age-related neurodegeneration.
- **Cognitive Enhancement:** Research indicates that Vesugen may improve cognitive functions such as memory, attention, and learning, which can decline with age.
- **Support for Neurodegenerative Diseases:** It has been studied for its potential benefits in conditions like Alzheimer's and other forms of dementia, where cognitive decline is a major concern.
- **Reduction of Oxidative Stress:** Vesugen may help mitigate oxidative stress, a key factor in the aging process, by supporting cellular repair mechanisms.
- **Relieve coronary heart disease symptoms:** It decreases cardiac arrhythmia and reduces frequency of angina attacks.
- **Stimulation of immune cells and stem cells**

© Pinealon

Pinealon is a peptide associated with the pineal gland. Its function in anti-aging involves:

- **Regulation of Melatonin:** It may influence melatonin production, which plays a crucial role in sleep regulation. Improved sleep quality is linked to better cognitive function and overall health in aging.
- **Cognitive Function:** Pinealon is believed to enhance cognitive abilities, potentially counteracting age-related cognitive decline and supporting memory and learning.
- **Cellular Health:** It may promote cellular longevity and health by enhancing neuroendocrine functions, which are vital for maintaining homeostasis as we age.
- **Potential Anti-Inflammatory Effects:** Pinealon may have anti-inflammatory properties, helping to reduce chronic inflammation often seen in aging.

(d) Lysine-proline-valine (KPV):

- **KPV is a peptide consisting of three amino acids:** lysine, proline, and valine.
- **Role of KPV Peptide in Anti-Aging**
- **Anti-Inflammatory Properties:** KPV has shown to modulate inflammatory responses by influencing cytokine production. Chronic inflammation is a significant factor in the aging process, contributing to various age-related diseases.
- **Gut health:** It helps Improve leaky gut by lowering gut inflammation and helps in management of inflammatory bowel disease and ulcers
- **Skin Health:** KPV may enhance wound healing and skin repair, making it potentially beneficial for maintaining skin integrity as it ages. It limits skin conditions such as dryness, redness, peeling, etc
- **Regulation of Melanogenesis:** KPV is associated with the regulation of melanin production, which could be relevant for skin health and protection against UV damage, a contributor to skin aging.
- **Potential for Neuroprotection:** KPV may have neuroprotective effects, supporting brain health and function, which is crucial as cognitive decline can occur with aging.
- **Muscle Preservation:** KPV may help preserve muscle mass, which tends to decline with age. Maintaining muscle strength is essential for overall health and mobility in older adults.

(e) Collagen Peptides:

Collagen peptides are short chains of amino acids derived from collagen, a key protein that provides structure to skin, bones, muscles, and connective tissues. They have gained popularity as a supplement for their potential anti-aging benefits, particularly for skin health. Their role in anti-aging includes:

Role of Collagen Peptides in Anti-Aging

- **Skin Elasticity and Hydration:** Collagen peptides may help enhance skin elasticity, reducing the appearance of fine lines and wrinkles. They can boost skin hydration levels, contributing to a more youthful and plump appearance.
- **Reduction of Wrinkles:** Supplementing with collagen peptides may stimulate the body's own collagen production, helping to reduce the depth and appearance of wrinkles over time.
- **Support for Skin Structure:** Supplementing with collagen peptides can help reinforce the skin's structure, promoting overall skin health.
- **Wound Healing:** Collagen peptides may aid in the healing of wounds and improve skin recovery after injuries, contributing to overall skin health as we age.

- **Joint and Bone Health:** Collagen peptides can benefit joint health by supporting cartilage integrity, which is important for mobility and reducing joint pain associated with aging. They may also contribute to improved bone density.
- **Hair and Nail Health:** Collagen peptides can promote stronger hair and nails, helping to prevent brittleness and breakage, which can be common with aging.
- (f) **Other peptides:** Thymosin Beta-4 (TB-500), BPC-157 (Body Protection Compound), Epitalon, Arginine Vasopressin (AVP), GHRP-6 (Growth Hormone Releasing Peptide-6), Cyclic GMP Peptides, Melanotan II are being explored for their promising role in anti-aging. They have anti-inflammatory and neuroprotective properties, promote tissue repair and regeneration, promote healing of muscles, improve blood flow and stimulate melanin production.

3. Oxytocin:

Oxytocin is the Longevity Hormone also referred to as the "love hormone,". It is known for its role in social bonding and emotional regulation. However, its potential benefits also extend to anti-aging

Role of in Anti-Aging

- **Stress Reduction:** Oxytocin can help reduce stress and anxiety levels which help in improving overall health and longevity, as chronic stress is linked to various age-related diseases.
- **Social Bonds and Emotional Well-Being:** Oxytocin promotes social bonding and trust, which are important for mental health and emotional well-being. Strong social connections have been shown to positively impact longevity.
- **Impact on Cardiovascular Health:** Oxytocin may help lower blood pressure and improve cardiovascular health, which is crucial for reducing the risk of heart disease as one ages.
- **Anti-Inflammatory Properties:** Oxytocin has been associated with anti-inflammatory effects, which can help mitigate chronic inflammation often seen in aging. Chronic inflammation is a significant contributor to many age-related diseases.
- **Pain Relief:** Oxytocin may have pain-relieving properties, which can help with chronic pain conditions.
- **Support for Reproductive Health:** Oxytocin plays a role in reproductive health and may help maintain hormonal balance, which is important for overall well-being as one ages.
- **Potential for Cognitive Enhancement:** Oxytocin may enhance certain cognitive functions, including memory and learning, potentially helping to counteract age-related cognitive decline.

4. Taurine supplementation:

Taurine is a sulfur-containing amino acid found in various foods and is crucial for numerous biological functions, including bile salt formation, osmoregulation, and antioxidant activity.

Research has shown that taurine can improve cardiovascular health, support metabolic function, and reduce oxidative stress—all important factors in the aging process. Supplementation may enhance the body's resilience to age-related decline.

Role of Taurine in Anti-Aging

- **Antioxidant Properties:** Taurine has antioxidant properties that help protect cells from oxidative stress, a significant contributor to aging and age-related diseases.
- **Cellular Health:** It is essential for maintaining cell membrane integrity and function, which is crucial for overall cellular health as we age.
- **Cognitive Function:** It may help protect against neurodegenerative diseases and support cognitive function, potentially mitigating age-related cognitive decline.
- **Cardiovascular Health:** Taurine is known to support heart health by regulating blood pressure and improving lipid profiles, reducing the risk of cardiovascular diseases associated with aging.
- **Anti-Inflammatory Effects:** Taurine may help modulate inflammatory responses, which can contribute to various age-related conditions and diseases.
- **Metabolic Health:** Taurine has been linked to improved glucose metabolism and insulin sensitivity, important factors for metabolic health as one ages.
- **Muscle Health:** It is involved in muscle function and may help preserve muscle mass and strength, which can decline with age.

6. Epicatechin-Rich Cocoa

Epicatechin-rich cocoa is gaining attention for its potential health benefits, and its role in anti-aging and overall wellness. Epicatechin is a type of flavonoid found in high concentrations in cocoa and dark chocolate, known for its antioxidant properties. Here's an overview of its role in promoting health and longevity:

- **Antioxidant Properties:** Epicatechin acts as a potent antioxidant, helping to neutralize free radicals that contribute to oxidative stress—a key factor in the aging process and the development of age-related diseases.
- **Cardiovascular Health:** Epicatechin may improve blood flow and vascular function supporting heart health and reducing the risk of cardiovascular diseases. Some studies have also indicated that epicatechin-rich cocoa can help lower blood pressure, which is crucial for overall cardiovascular health.
- **Cognitive Function:** Epicatechin has been linked to improved cognitive function and

may help protect against neurodegenerative diseases. Its ability to enhance blood flow to the brain could support mental clarity and memory.

- **Anti-Inflammatory Effects:** Epicatechin may help modulate inflammatory responses, which can contribute to various age-related conditions. Chronic inflammation is a common factor in many diseases associated with aging.
- **Metabolic Benefits:** Epicatechin has been linked to improved insulin sensitivity and may help regulate blood sugar levels, which is important for metabolic health as one ages.

Regular consumption of epicatechin-rich cocoa has been linked to improved cardiovascular health, enhanced cognitive function, and reduced inflammation

7. Plasmapheresis:

Plasmapheresis is a medical procedure that involves the removal and separation of plasma from the blood, allowing for the removal of certain substances and the reinfusion of the remaining components back into the body. In recent years, it has gained attention in the context of anti-aging and longevity research.

Studies indicate that plasmapheresis may rejuvenate the circulatory system by reducing inflammation and improving overall health markers. As a therapeutic intervention, it offers a novel approach to mitigating the negative effects of aging and promoting longevity.

Role of Plasmapheresis in Anti-Aging

- **Elimination of Toxins and Inflammatory Markers:** Plasmapheresis can help remove circulating toxins, inflammatory cytokines, and other age-related biomarkers that may contribute to cellular aging and chronic diseases.
- **Reduction of Inflammation:** By reducing the levels of pro-inflammatory substances in the plasma, plasmapheresis may help lower chronic inflammation, which is often linked to various age-related diseases.
- **Potential Improvement in Blood Composition:** The procedure may improve the overall composition of the blood, potentially enhancing nutrient delivery to tissues and organs, supporting overall health.
- **Influencing Hormonal Levels:** Some studies suggest that plasmapheresis may influence the levels of certain hormones, which can play a role in aging and metabolic processes.
- **Cognitive Benefits:** By reducing inflammation and removing harmful substances from the blood, plasmapheresis may help protect against neurodegenerative conditions, potentially supporting cognitive function as one ages.
- **Potential Role in Disease Management:** Plasmapheresis has been used in managing various conditions, including autoimmune diseases, and may offer benefits for older

adults facing chronic health issues.

Plasmapheresis shows promise in anti-aging by potentially reducing inflammation, removing age-related biomarkers, and improving overall blood composition.

Summary

Innovative anti-aging strategies such as enhancement of natural killer (NK) cells, peptide bioregulators, hormone oxytocin, plasmapheresis, taurine supplementation, and the benefits of epicatechin-rich cocoa may combat the effects of aging . Each of these components offers unique mechanisms that may contribute to healthier aging and improved quality of life.

SECTION C

**Weight Management and
Cosmetic Treatments**



CHAPTER

Eighteen

Weight Management

Weight management is an important part of anti-aging treatment, as it can help improve physical function and reduce the risk of other health problems associated with obesity or being underweight.

As age increases, changes in metabolism often result in weight gain. Keeping your weight in the normal range is an important part of healthy aging. However, obesity and elevated body mass index (BMI) can accelerate aging and increase the risk of age related diseases such as cardiovascular diseases, high blood pressure, stroke, arthritis, osteoporosis and diabetes. Lack of movement, less physical activity, reduced motivation and mental health issues associated with aging can further lead to weight gain. Additionally, it can lead to decreased muscle mass and bone density, contributing to a lower quality of life and increased risk of falls and fractures. Effective weight management helps mitigate these risks, promoting healthier aging.

Being underweight or low BMI is also not healthy. It increases the risk of nutritional deficiency, anemia and osteoporosis, weakens immunity and impacts energy levels.

Maintaining healthy weight thus decreases the risks of development of diseases and helps in healthy aging.

At KLS Wellness, we offer a comprehensive weight management program tailored to address the unique challenges faced by individuals struggling with weight gain, using a holistic approach that includes consultations, physical assessments, targeted treatments, and lifestyle interventions.

Comprehensive Treatment Approach at KLS Wellness Our program at KLS Wellness involves a detailed, multi-step approach to weight loss:

- **Consultation and Assessment:**

- A thorough consultation is conducted to understand the individual's eating habits, lifestyle, and any chronic diseases that may be resisting weight loss.
- Physical assessments are combined with blood investigations to identify parameters like thyroid function, insulin resistance, and hormonal imbalances that can contribute to weight gain.

- **Cardiovascular Screening and BMI Analysis:**

- Cardiovascular screening is performed to assess vascular health, heart health, as excess weight can put strain on the cardiovascular system.
- Body Mass Index (BMI) is calculated to determine the degree of overweight or obesity, helping to customize the treatment plan.

Treatment Components for Weight Management

- **Detoxification :**

- **Gut cleansing and Hydro Colon Therapy:** This is a gentle and safe procedure that helps to cleanse the colon, removing toxins and waste that can impede metabolism and contribute to weight gain. An oil enema is given 2 days before colon therapy to lubricate the gut and decrease bloating and a herbal enema is administered a day prior to the colon therapy to cleanse a mug accumulated in the rectum . Colon cleansing process serves as a first step to the weight management journey.
- **Detox Massages:** Specialized massages are used to stimulate the lymphatic system, aiding in the removal of toxins, reducing bloating, and improving digestion.
- **Infrared Sauna :** An infrared sauna uses infrared light to generate heat, which penetrates deep into the skin and warms the body from within. This process induces a profuse sweat, helping to expel toxins such as heavy metals, chemicals, and other impurities stored in fat cells. The heat also increases the heart rate and metabolic rate, mimicking the effects of a moderate workout and aiding in calorie burning. Incorporating Infrared sauna in our weight management program supports detoxification, enhancing circulation, and improving the body's overall metabolic function, leading to gradual and sustainable fat loss.
- **Ozone Light Sauna :** An ozone light sauna combines the benefits of light therapy

with the healing properties of medical ozone. When ozone is introduced to the skin, it helps stimulate the lymphatic system, enhancing the body's ability to detoxify and eliminate toxins. The heat from the sauna promotes sweating, which assists in flushing out impurities, while the ozone penetrates the skin, improving oxygenation and boosting metabolism. This combination can accelerate fat loss, improve skin texture, and enhance overall well-being by removing waste products more efficiently and promoting healthy cellular function.

- **Weight Management Machines:**

- **Cellulite Deep Heat:** Cellulite deep heat therapy helps in mobilization of fat cells, reducing the appearance of cellulite and improving skin elasticity. It emits heat at pre-selected temperatures to ensure penetration into deep tissues. The heat applied during therapy along with burning the targeted fat cells in the body also increases blood circulation and enhances metabolism. This therapy can burn more calories than conventional forms of physical exercise.
- **12-Channel Electrical Stimulation:** This machine stimulates muscle contractions, helping to tone and strengthen muscles while promoting fat loss.
- **Cryolipolysis (Fat Freezing):** A non-invasive procedure that targets fat cells by freezing them, leading to their gradual reduction and elimination from the body. It focusses on removal of fat deposits from a specific area. Cryolipolysis can be beneficial for those who are in need of removing lumps and stubborn fat residues in the body which cannot be removed by exercising.
- **Cool Sculpting:** CoolSculpting is a non-invasive fat reduction treatment that works by using controlled cooling to target and freeze stubborn fat cells beneath the skin. This process crystallizes the fat cells, causing them to break down and gradually be eliminated by the body's natural metabolic processes over several weeks. Unlike traditional weight loss, which reduces the size of fat cells, CoolSculpting physically removes them, leading to a noticeable and long-lasting reduction in fat in treated areas. This method is especially effective for contouring body shape, as it can precisely target problem areas such as the abdomen, thighs, flanks, and arms, resulting in a slimmer, more sculpted appearance without the need for surgery or downtime.
- **Radio Frequency (RF):** Radio frequency (RF) is a nonsurgical treatment that uses heat to reduce fat and skin tightening. This benefits out patients who have flabby , loose or sagging skin It uses an electrical current to heat the dermis, to temperatures above 60° C. This disrupts the fat cell membrane, causing the fat cells to shrink. RF can be used to treat stubborn fat deposits in areas like the thighs, buttocks, lower stomach, double chins, and love handles and also reduce cellulite.

- **Diet in Weight Loss Program**

Diet plays a crucial role in effective weight management. Our program emphasizes a

balanced, nutrient-dense eating plan that helps to regulate metabolism, reduce cravings, and ensure steady, sustainable weight loss.

Key aspects include:

- **Portion Control:** Managing portion sizes to prevent overeating without feeling deprived.
 - **Balanced Macronutrients:** A well-rounded intake of proteins, healthy fats, and complex carbohydrates to fuel the body and maintain energy levels.
 - **Increased Fiber:** Including fiber-rich foods like vegetables, fruits, and whole grains to support digestive health and maintain satiety. At KLS wellness we provide a meal plan which is not only healthy and nutritious but delicious at the same time.
 - **Hydration:** Ensuring adequate water intake to aid digestion and metabolism, while also helping to curb unnecessary snacking.
- Role of Exercise in Weight Management

Regular physical activity is essential for effective weight loss and long-term weight maintenance. Exercise not only burns calories but also improves muscle tone, boosts metabolism, and enhances cardiovascular health. At KLS Wellness, we encourage incorporating a mix of aerobic activities (like walking, cycling, or swimming) and strength training exercises to build lean muscle, which helps in burning more calories even at rest. A customized workout plan ensures individuals can follow a routine that aligns with their fitness levels and goals.

Weight management is not just about losing excess pounds; it's about improving overall health, especially as we age. At KLS Wellness, our comprehensive treatment approach addresses the root causes of weight gain, providing individuals with the tools they need for effective, sustainable weight loss. With a combination of medical assessments, targeted treatments, personalized diet plans, and exercise routines, in combination with detoxification and weight reduction medical devices, we strive to help individuals lead healthier, more active lives.

Summary

As age increases, changes in metabolism often result in weight gain. Obesity can accelerate aging and increase the risk of age related diseases such as cardiovascular diseases, high blood pressure, stroke, arthritis, osteoporosis and diabetes. Weight management is an important part of anti-aging treatment that can help improve physical function and reduce the risk of other obesity related health problems.

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CHAPTER

Nineteen

Aesthetic Medicine

While aging of internal organs is masked, signs of aging on skin and hair are quite inevitable. Skin and Hair health are considered one of the principal factors representing overall “well-being”. Presentation of aging of the entire face is associated with the gravity impact, muscles action, loss of volume, diminishing and redistribution of superficial and deep fat, loss of bony skeleton support, loss of collagen all together lead to the face sagging, changes in shape and contour, wrinkles, discolouration, etc. Whereas, signs of aging on hair may include greying, thinning of hair, hair becoming dry, very slow or no regrowth.

Aesthetic medicine is a branch of modern medicine that focuses on enhancing a person's appearance through non-surgical and minimally invasive procedures. Healthy youthful skin and hair with growing age are considered a sign of healthy aging. From this perspective, preventative aesthetic medicine for skin and hair might fulfill the need for healthy aging and delay skin aging by combining local and systemic methods of therapy, instrumental devices and invasive procedures.

Some of the procedures used to improve skin and hair health are described below:

- **Chemical peels**

A treatment used to improve the texture of the skin and smoothen it. Chemical peels are

intended to remove the outermost layers of the skin to induce an even and tight skin as a result of the regeneration and repair mechanisms after the inflammation of the epidermis and dermis layers of the skin. This process leads to smoother skin, can improve fine lines, minimize wrinkles, reduce scars, and pigmentation. Peels are often used to treat the skin on the face but can be performed on other parts of the body.

Three types of chemical peels are used:

- **Light chemical peel:** A light or superficial chemical peel removes only the outer layer of skin (epidermis). The target area for this chemical peel is to treat fine wrinkles, acne, uneven skin tone and dryness. A light peel can be done every two to five weeks.
- **Medium peel:** A medium chemical peel removes skin cells from the epidermis and slightly deeper portions of the upper part of your middle layer of skin (dermis). The target area is also wrinkles, deeper acne scars and uneven skin tone.
- **Deep chemical peel:** A deep chemical peel removes skin cells from even deeper layers. This procedure might be recommended for deeper wrinkles, scars or precancerous growths.

Superficial peels can also result in residual temporary post-inflammatory hyperpigmentation, whereas the deeper peels produce an initial hyperpigmentation followed by hypopigmentation. Hence at KLS wellness institute chemical peels is done by dermatologist and aesthetic practitioners only.

• Microneedling

Microneedling is a minimally invasive procedure which uses thin sterile needles to make tiny holes in the top layer of your skin. The damage helps stimulate skin's healing process, so it produces more collagen and elastin. These proteins keep the skin firm and smooth. Most people get microneedling on their face, but it can also be done on the hair, legs, back, neck or other areas where damaged or aging skin is prominent. It is effective to reduce the appearance of scars, dark spots, wrinkles, and large pores. It is also combined with other anti-aging procedures to give a better outcome.

Microneedling is a safe procedure, but some minor risks may include Bruising, Scarring and Skin infection. Hence should be done by an aesthetic doctor and dermatologist under sterile precautions.

• Specialised Facials

- Hydrafacial

The Hydrafacial is a multistep facial treatment typically performed with a proprietary machine (Hydrafacial MD) manufactured by Edge Systems. Aestheticians can use the Hydrafacial device to cleanse, exfoliate, extract, and deliver a variety of rejuvenating serums. Hydrafacial uses an exfoliating tip paired with suction to remove dead skin cells from the surface of the face. After the exfoliation, serums are infused into the skin. The

Hydrafacial treatment takes only as little as 30 minutes. The treatment can increase hydration, radiance, skin texture, pore size and appearance of fine lines.

➤ **PRP facial**

Plasma-rich protein (PRP) facial triggers collagen production and, via micro-needling, it improves skin tone and texture. PRP is prepared from the individual's own blood by processing it in a centrifuge.

There are several ways to get the PRP facial. It can be done by either spreading the plasma on the face, after which micro-needling is performed across the face or by simply injecting PRP at various areas of the face at 1 cm distance. Both the micro-needling and the PRP stimulate collagen growth. Hence it is effectively used to treat wrinkles, fine lines, crow's feet, sun damage, open pores, post inflammatory or post acne scars, pigmentation, etc. This facial is also called a vampire facial.

The PRP procedure is safe but may have temporary side effects that include pain, swelling, or bruising after the procedure that goes away in a few days. Other possible side effects may be a result of incorrect handling. The facial involves drawing blood and pricking the skin, so serious complications like infection, scarring, and bleeding can occur if done incorrectly.. The PRP facial equipment needs to be sterile to reduce the risk of contracting blood-borne illnesses.

• **Hair PRP (Platelet-Rich Plasma) therapy**

It is a non-surgical treatment offered at KLS Wellness Institute that promotes hair growth and addresses hair thinning by using the body's own healing properties. The procedure involves drawing a small amount of the patient's blood, which is then processed to separate and concentrate the platelets. These platelets, rich in growth factors, are injected into the scalp at targeted areas to stimulate hair follicles, improve hair density, and



enhance overall hair health. Hair PRP is commonly used to treat conditions like androgenic alopecia (pattern baldness) and hair thinning due to stress or hormonal changes.

While generally safe and minimally invasive, the treatment may have mild side effects such as temporary scalp tenderness, swelling, or redness. However, it is considered a low-risk procedure with no downtime, making it an effective and convenient solution for those seeking natural hair rejuvenation.

- **Botox**

The most exciting breakthrough in anti aging therapy has been botulinum toxin (Botox) injections. Botox injections are shots that use a neurotoxin which blocks nerve signals to muscles and causes muscle weakening which prevents a muscle from contracting temporarily. These shots are often used to treat fine lines and dynamic wrinkles on the face that form due to facial movements when you make expressions, such as frowning, smiling, and squinting. The effect of Botox lasts for several months. Side effects from botulinum toxin injections vary depending on the area receiving treatment. Most issues are mild and improve in a day or two.



Possible Botox side effects include: Pain, swelling, redness or bruising at the treatment site, Flu-like symptoms, Headache, Neck pain, Upset stomach (indigestion), Temporary drooping eyelids (ptosis). Hence KLS this treatment is done by an expert dermatologist

- **Fillers**

As the body ages, it starts to lose collagen. Collagen is an important substance that exists all over your body, including in your skin, muscles, bones and connective tissues. Decreased amounts of collagen in your skin causes skin laxity (looseness) and loss of volume. Skin becomes thinner, loses its elasticity and starts to sag. Dermal filler injections are a type of nonsurgical cosmetic procedures that use fillers or products which plump up wrinkles, smooth lines and restore volume in the face thereby improving skin laxity. The filler is made up of mainly Hyaluronic Acid, Cross-Linking Agents, etc

This procedure is performed by injecting these substances under the skin layer or deeper inside depending on the requirement of the facial features to gain a more youthful appearance. This elective treatment usually takes less than half an hour, and recovery time is minimal. Results are seen immediately and last months to years depending on the type of filler and the location.

Risks of using dermal fillers: Serious complications are rare, and some of these side effects are only temporary like Asymmetrical appearance, Bleeding, bruising, redness, pain and swelling, Lumps or bumps under your skin, Numbness, Pimples that look like acne, Rash and itching, rarely scar formation and infection. Rarely, people have vision problems following dermal filler injections. Hence at KLS this procedure is administered by an expert dermatologist only.

- **Radio frequency device**

The radiofrequency (RF) device is a cutting-edge technology used for non-invasive facial

treatments aimed at skin tightening and rejuvenation. Radiofrequency energy works by delivering controlled heat to the deeper layers of the skin, stimulating collagen and elastin production while tightening existing collagen fibers. The treatment typically begins with an application of a conductive gel to enhance the effectiveness of the RF waves. The RF device is then moved across the targeted areas of the face, delivering gentle heat that promotes cellular regeneration and improves skin texture. Radiofrequency treatments are used to address various skin concerns, including fine lines and wrinkles, sagging skin, and uneven texture. They are particularly effective for individuals looking to achieve a more youthful appearance without the need for surgical interventions. The procedure is generally safe, with minimal downtime, allowing patients to return to their daily activities immediately.

However, potential risks include mild redness, superficial burns, swelling, or discomfort at the treatment site, which typically resolves quickly. Hence at KLS wellness institute this treatment is done by trained aesthetic practitioners.

- **Laser skin resurfacing**

Laser skin resurfacing, also known as laser peel, laser vaporization or lasabrasion, removes skin layer by layer with precision. The new skin cells that form during healing give the skin a tighter, younger looking surface. It also effective in counteracting photoaging

The procedure can be done alone or with other cosmetic surgeries on the face. This treatment is often carried out as part of anti-aging therapies.

Laser skin resurfacing can be broadly divided into ablative skin resurfacing (ASR), which can be accomplished by the use of pulsed carbon dioxide and erbium or non-ablative, which can be achieved by non-ablative neodymium-YAG system, intense pulsed light, fractional photo-thermolysis or light emitting diode photomodulation. Different types of laser treatments available at KLS wellness institute are :

- **CO2 Laser Resurfacing**

CO2 laser resurfacing (fractionated CO2) uses very short pulsed light energy (known as ultrapulse) or continuous light beams that are delivered in a scanning pattern to remove thin layers of skin with minimal heat damage. Recovery takes up to two weeks.

This method has been used for years to treat different skin issues, including wrinkles, scars, warts, enlarged oil glands on the nose, and other conditions.

- **Neodymium Yag Laser**

This type of laser has a longer wavelength that goes deeper into the skin, effectively bypassing the melanin in the upper layers of your skin. It is particularly effective in facial or body hair removal, tattoo removal, birthmark removal, inflammatory acne, hyperpigmentation, vascular reduction.

- **High-intensity focused ultrasound (HIFU)**

High-intensity focused ultrasound (HIFU) is a minimally invasive procedure that uses ultrasound waves for facial treatments. This focused energy heats up the cells and causes cellular damage which actually stimulates the cells to produce more collagen that results in tighter, firmer skin with fewer wrinkles. It helps also in tightening sagging skin on the neck (sometimes called turkey neck), lifting the cheeks, eyebrows, and eyelids, enhancing jawline definition, tightening of the décolletage.

Since the high-frequency ultrasound beams are focused on a specific tissue site below the skin's surface, there's no damage to the upper layers of the skin and adjacent tissue. HIFU may not be appropriate for everyone. In general, the procedure works best on people older than 30 with mild-to-moderate skin laxity. People with photodamaged skin or a high degree of loose skin may need several treatments before seeing results. HIFU isn't recommended for people with infections and open skin lesions at the target area, severe or cystic acne, and metallic implants in the treatment area.

Risks of Laser Treatment

There are some risks to be considered before opting for laser treatment which include, Burns from the laser's heat, Scarring due to burns from the laser, Changes in skin pigmentation can cause darker or lighter areas on the skin, It can reactivate Herpes cold sores. The injury or burn caused from the laser can be a site of bacterial infection. Hence before opting for any aesthetic procedure a thorough consultation is done with the patient, a dermascope is used and seeing the skin quality only laser therapy is planned for the patient.

KLS Wellness Institute is a specialized hospital dedicated to anti-aging, offering comprehensive treatments that target both cellular and visible signs of aging. Alongside advanced cellular anti-aging therapies that work at the biological level to slow down the aging process, the institute also provides aesthetic skin treatments designed to reduce visible signs of aging, such as wrinkles, fine lines, and skin laxity. Treatments are also available for acne, blemishes, uneven skin tone, post inflammatory pigmentation, melasma, warts, moles, unwanted hair growth, hair loss, etc. Through a combination of cutting-edge technology and personalized care, KLS Wellness Institute helps clients achieve a more youthful appearance and improved overall well-being.

Summary

Skin and Hair often show first visible signs of aging. Aesthetic medicine offers treatment strategies which combat these signs and helps slow down the aging process and or reverse the aging signs like skin sagging, wrinkles, fine lines, skin dryness, hair thinning, etc.

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SECTION D

**Age Related Conditions
and Preventive Care**



CHAPTER

Twenty

Cancer

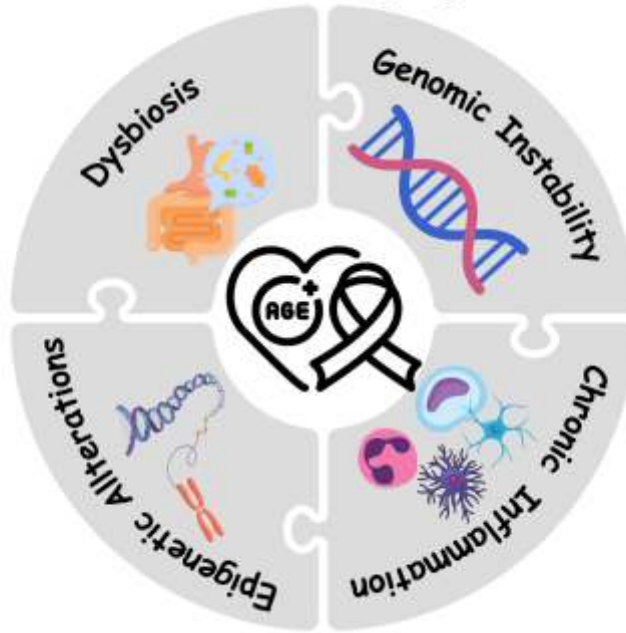
Disclaimer: All types of cancers should be treated with standard conventional treatments such as surgery, chemotherapy, radiation, or immunotherapy, etc. Treatments mentioned in this chapter are only palliative and they are not substitutes for the conventional treatments. Always consult a qualified healthcare provider, oncologist, or specialist before making any changes to your cancer treatment plan.

Cancer can be considered as an age-related disease because the incidence of most cancers increases with age. Aging and cancer are highly interrelated as some of the biological mechanisms involved with aging such as deregulated nutrient sensing, genomic instability, telomere shortening, mitochondrial dysfunction, cellular senescence, aberrant epigenetic alterations, intestinal dysbiosis, imbalance of protein homeostasis, loss of proteostasis, stem cell exhaustion, altered intercellular and intra-cellular communications, and inflammation are similar to those reflected in the process of carcinogenesis.

Prevention

Cancer does not have to be an inevitable consequence of growing older. Midlife is a period in one's life when the prevalence of multiple cancer risk factors is high and incidence rates begin to increase for many types of cancer. There are many interventions that one can start in midlife to prevent or delay the occurrence of cancer at old age. These interventions

Inter-relation of Aging and Cancer



include a healthy environment, lifestyle changes, appropriate screening, management of other chronic conditions, etc. These might help people make a healthier transition from midlife to older age and reduce the likelihood of developing cancer.

Commonly recommended lifestyle changes to prevent cancer

- Stop use of tobacco and smoking
- Limit alcohol consumption
- Consume plant based diet and avoid red meat
- Maintain healthy weight and increase physical activity
- Manage stress
- Avoid exposure to environmental carcinogens.

Some of the therapeutic modalities explained in the previous section which have the ability to slow down aging at the molecular level, such as HBOT, ozone therapy, Micronutrient therapy, naturopathy treatments, Lymphatic drainage and treatments improving microcirculation can help a great deal in prevention or delay of cancer.

Palliative care

The goal of palliative care for cancer is to improve the quality of life of the affected individual. It is essential for the physical, mental, and psychosocial health of patients.

Palliative care can be a part of the comprehensive treatment designed for the patient. Early integration of palliative care shows marked improvement in patient satisfaction, mood, quality of life, health care utilization, and overall survival.

Palliative care for cancer mainly involves:

Prevention and treatment of symptoms mainly pain, fatigue, loss of appetite, nausea, vomiting, shortness of breath, and insomnia.

Addressing emotional problems such as psychological, social, and spiritual problems caused by the disease or its treatment.

Family and caregiver support

Complementary therapies that may support overall well-being by providing valuable support for cancer patients by reducing symptoms, improving emotional well-being, and enhancing the quality of life during treatment are:

- (i) Ozone therapy
- (ii) HBOT
- (iii) Infrared Sauna
- (iv) Cryotherapy for some cancers
- (v) Yoga and meditation
- (vi) Acupuncture
- (vii) Massage Therapy
- (viii) Nutritional support

Summary

Integrative treatments such as HBOT, Ozone therapy, Infrared Sauna, cryotherapy, yoga and meditation, massage therapy, micronutrient therapy, etc may support overall well-being by providing valuable support for cancer patients by reducing symptoms, improving emotional well-being, and enhancing the quality of life during cancer treatment

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CHAPTER

Twenty One

Neurodegenerative Conditions

Disclaimer: All neurodegenerative conditions should be treated with standard conventional treatments. Treatments mentioned in this chapter are only palliative and they are not substitutes for the conventional treatments. Always consult a qualified healthcare provider, or specialist before making any changes to your treatment plan.

Neurodegenerative disorders are chronic conditions that occur when nerve cells in the brain or peripheral nervous system lose function over time and ultimately die. As the body ages, the brain and nervous system go through natural biological changes.

These changes mainly include:

1. Loss of neuronal cells in the brain and spinal cord
2. Changes in the brain regions such as hippocampus, prefrontal cortex, etc
3. Atrophy of the brain
4. Decline in Hormone and protein production that protect and repair the brain cells and stimulate nerve growth
5. Decreased blood flow

6. Accumulation of waste products such as beta amyloid in the brain tissue as nerve cells break down which can further lead to plaque formation in the brain.

These physiological changes in the brain cells can eventually affect crucial functioning of aging individuals. It may result in:

- Loss of reflexes or sensation
- Problems with movement
- Loss of balance
- Increased incidences of falls
- Difficulty carrying out daily tasks
- Cognitive decline
- Slowing of thoughts
- Recalling information becomes difficult
- Brain fog
- Memory loss
- However, they can also lead to more severe neurological conditions such as Dementia and Alzheimer's disease.

(a) Dementia

Dementia is a syndrome that can be caused by a number of diseases which over time destroy nerve cells and damage the brain, typically leading to deterioration in cognitive function beyond what might be expected from the usual consequences of biological aging. It develops when the parts of the brain involved with learning, memory, decision-making or language are affected by infections or diseases. A person with dementia has two or more of these specific difficulties, including a decline in memory, reasoning, coordination, mood, language and behaviour.

Types of dementias include:

- **Vascular dementia:** This type of dementia is caused by damage to the vessels that supply blood to the brain.
- **Lewy body dementia:** Progressive dementia with presence of Lewy bodies. Common symptoms include visual hallucinations, tremors, slow movement, etc
- **Frontotemporal dementia:** This is a type of dementia characterized by the breakdown of nerve cells and their connections in the frontal and temporal lobes of the brain. These areas are associated with personality, behavior and language.

Mixed dementia: Dementia with a combination of presentations of vascular dementia, Alzheimer's, etc

(b) ALZHEIMER'S DISEASE

Alzheimer's disease is a neurodegenerative condition characterized by the presence of certain protein deposits. It occurs when abnormal amounts of amyloid beta ($A\beta$), accumulates extracellularly as amyloid plaques and tau proteins, or intracellularly as neurofibrillary tangles in the brain, affecting neuronal functioning and connectivity. This results in a progressive loss of brain function. This altered protein clearance ability is age-related, regulated by brain cholesterol, and associated with other neurodegenerative diseases. This results in progressive impairment of behavioral and cognitive functions such as memory, comprehension, language, attention, reasoning, and judgment. While Alzheimer's disease does not directly cause death, it substantially raises risk of other complications, which can eventually lead to a person's death.

Age is the biggest known risk factor for Alzheimer's. Most people with Alzheimer's develop the disease when they are 65 or older, with less than 10% of cases occurring before that. These age-related changes include:

- Shrinking of certain brain regions
- Inflammation
- Blood vessel damage
- The production of free radicals
- Decreased energy production within cells.

Prevention of age related neurodegenerative conditions:

These age-related neurodegenerative disorders are incurable therefore there is great importance given to prevention of onset and progression of these conditions.

Few preventive measures that can be taken early in life are:

- Increasing physical activity and exercise
- Following a healthy diet
- Increasing brain activities
- Getting enough vitamins
- Managing cardiovascular risk factors such as blood pressure, etc
- Getting optimum vitamins and minerals
- Quit smoking and limiting alcohol

Anti-aging treatments have shown promising results in prevention and delaying the onset of neurodegenerative disorders. Treatments such as HBOT, ozone therapy can help improve oxygenation, blood flow, decrease the risk of plaque formation and decrease inflammation thereby prolonging the occurrence of dementia and Alzheimer's.

Palliative care:

Palliative care for these conditions includes a multidimensional approach to not only improve symptoms but also the quality of life of the affected individual. It involves a team of clinicians including physicians; mental health professionals; occupational, speech and physical therapists; nutritionists and others to help manage the disease.

The palliative care approach involves:

- Treatment of neuropsychiatric symptoms such as depression or agitation.
- To design structured day to day routines with the help of experts.
- Optimum nutrition.
- Physical activity.
- Maintain a safe environment.

Complementary therapies that may promote overall well-being of individuals living with neurodegenerative diseases by managing symptoms, reducing stress, improving emotional well-being, and enhancing the quality of life alongside conventional treatment are:

(I) HBOT

(ii) Hydrocolon therapy

(iii) Rehabilitation therapy

(iv) Shirodhara

(v) Micronutrient therapy

(vi) Yoga and meditation

(vii) Infrared Sauna

(viii) Massage Therapy

(ix) Nutritional support

Summary

Complementary therapies such as HBOT, Ozone therapy, Hydrocolon therapy, Shirodhara, Micronutrient therapy, infrared sauna, massage therapy, etc promote overall well-being of individuals living with neurodegenerative diseases by managing symptoms, reducing stress, improving emotional well-being, and enhancing the quality of life alongside conventional treatment.

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CHAPTER *Twenty Two*

Cardiovascular Diseases

Disclaimer: All cardiovascular diseases should be treated with standard conventional treatments. Treatments mentioned in this chapter are only palliative and they are not substitutes for the conventional treatments. Always consult a qualified healthcare provider, or specialist before making any changes to your treatment plan.

Aging is associated with a progressive decline in the health of the cardiovascular system that is the heart, arteries, veins and capillaries which leads to increase in risk of cardiovascular diseases including atherosclerosis, hypertension, myocardial infarction, and stroke. Cardiovascular disease is one of the major causes of disabilities in the aging population which can limit activity and affect their quality of life.

Changes that occur in the heart and blood vessels are

- Slowing of heart rate due to development of fibroid tissue and fat deposits in the heart.
- Degeneration of heart muscles
- Thickening of heart walls which affect the blood flow and increase risk of stroke.
- Thickening of heart valves limit the flow of blood out of the heart or become leaky, both of which can cause fluid to build up in the lungs or in the legs, feet, and abdomen.

- Abnormal heart rhythm or irregular heartbeat is common in the older population..
- Blood capillary also thickens with age, slowing the rate of exchange of nutrients and wastes.
- The main artery from the heart (aorta) becomes thicker, stiffer, and less flexible which raises the blood pressure and forces the heart to work harder, which may lead to thickening of the heart muscle (hypertrophy). The other arteries also thicken and stiffen. As a result, most older people have increased blood pressure.

PREVENTION

Even if aging is a major risk factor for cardiovascular diseases in older adults, it is absolutely possible to prevent it or delay its onset.

Some preventive measures that one can take from the young age are:

- To Stay physically active and incorporate strength training and aerobic exercises which benefit the heart.
- Quit Smoking as it damages the arterial walls
- Consume healthy diet
- Maintain healthy weight
- Avoid alcohol
- Manage stress
- Get enough sleep
- Manage hypertension and diabetes
- Medicines like statins can be prescribed by the healthcare expert to reduce risk of heart disease.

Along with simple lifestyle changes, many anti-aging modalities can be used which improves microcirculation in the body, slows down cellular aging and prevents the organs from getting damaged because of aging processes.

Palliative care

Palliative care for cardiovascular diseases is a multidisciplinary approach that focuses on improving the quality of life of patients. Followed by the medical treatment of the condition, palliative care focuses on symptom management. It also includes empowering the patients to make decisions regarding their treatments and providing support to the caregivers.

HBOT improves cardiovascular functions, ozone therapy protects from ischemic heart diseases, reduces oxidative stress and improves blood circulation and oxygen flow to the tissues.

Summary

Integrative therapies such as HBOT improves cardiovascular functions, ozone therapy protects from ischemic heart diseases, reduces oxidative stress and improves blood circulation and oxygen flow to the tissues thereby offering palliative care for individuals with cardiovascular diseases.

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CHAPTER

Twenty Three

Orthopedic Conditions

Disclaimer: All orthopedic conditions should be treated with standard conventional treatments. Treatments mentioned in this chapter are only palliative and they are not substitutes for the conventional treatments. Always consult a qualified healthcare provider, or specialist before making any changes to your treatment plan.

As people age, they are at a higher risk of suffering from orthopedic conditions due to reduced bone density, degeneration of ligaments and joints, limited movement and physical activity. Hormonal imbalance is also responsible for bone loss. Commonly occurring age related orthopedic conditions are:

(I) Osteoporosis:

It is a bone disease where bone mass and bone mineral density decreases, leading to an increased risk of fractures. With age, there is more bone loss as compared to regeneration. Tiny holes within bones get bigger, and the solid outer layer becomes thinner making the bones less dense. Hard bones become spongy, and spongy bones turn spongier. When this loss of bone density goes too far, it's called osteoporosis. It's a common condition in aging adults, affecting both men and women. However, it's more prevalent in women because after menopause, levels of estrogen decrease in women. Estrogen helps to make and rebuild bones therefore reduced levels of estrogen leads to accelerated bone loss. The hip is

a common site for osteoporosis, and hip fractures can lead to severe disability and loss of independence amongst older adults. Osteoporosis is also common in the wrist and the spine.

(ii) Osteoarthritis (OA):

It is an age related chronic degenerative disease and one of the most common sources of pain and disability in the elderly. In OA, the tissues that cushion the ends of the bones within the joints break down over time due to wear and tear. It mostly occurs because of age-related loss in the ability of cells and tissues in the body to repair and restore. These changes usually develop slowly and worsen gradually, causing pain, stiffness, and swelling. In some, it causes severe disability where people are unable to perform daily tasks. Risk factors associated with OA are obesity, history of injury or surgery to a joint, overuse from repetitive movements of the joint, incorrect formation of joints and family history of osteoarthritis. Knee, hips and hands are the common joints which get affected due to OA.

(iii) Cervical spondylosis:

It is the most common age related chronic degenerative condition caused due to wear and tear of the bone and tissues around the neck. It affects the vertebral bodies and intervertebral disks of the neck, and may progress into disk herniation, bone spur formation and compression of the spinal cord.

It is believed that more than 85% of adults above 60 years of age suffer from cervical spondylosis. The prevalence of cervical spondylosis is similar for both sexes, although the degree of severity is greater for males.

Risk factors of cervical spondylosis involve repeated occupational trauma such as carrying heavy loads on the heads or shoulders, dance and gymnastics. It can also occur due to congenital bony anomalies, blocked vertebrae, malformed laminae that place undue stress on adjacent intervertebral discs.

Prevention:

There's a lot you can do to lower your risk of orthopedic problems such as

- Getting sufficient calcium and vitamin D through diet and supplementation
- Exercise and physical movement, especially weight-bearing exercise, such as jogging, walking, tennis, and dancing.
- Maintain healthy weight
- Control diabetes
- Prevent injury to the joints
- Improve posture

- Avoid Smoking and alcohol
- Several medications can also help fight bone loss.

Screening tests are also performed to check the bone mineral density from time to time. Most common test is the DEXA scan which measures the strength and thickness of bones by using low-dose X-rays to measure the amount of calcium and other minerals in them.

Anti-aging treatments which slow down cellular aging can be used to maintain bone health and prevent bone loss.

Palliative care

- Physical therapy, occupational therapy are advised to patients suffering from age related orthopedic conditions
- Treatments like HBOT which have an anti-inflammatory effect are also beneficial in treating these conditions when combined with clinical treatments.

Summary

Orthopedic conditions are the most common in aging. Integrative treatments can be used for prevention as well as palliative care for orthopedic conditions. Rehabilitation treatments including physiotherapy, occupational therapy, aquatic therapy, HBOT are beneficial in treating these conditions when combined with clinical treatments.

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CHAPTER

Twenty Four

Diabetes Mellitus

Disclaimer: Diabetes Mellitus should be treated with standard conventional treatments. Treatments mentioned in this chapter are only palliative and they are not substitutes for the conventional treatments. Always consult a qualified healthcare provider, or specialist before making any changes to your treatment plan.

Diabetes is one of the most common age related conditions. Presently, the world is facing a diabetes epidemic due to the growing adult population as a result of long life expectancy and lifestyle modifications. Diabetes occurs when a person's blood glucose levels are too high. Our body derives most energy from glucose that can be made within the body and also from the food that is consumed. To use this glucose, we need insulin that is a hormone required to help glucose get into the cells. However, in individuals with diabetes, the insulin production is not enough and/or it is not used in the right way which caused excess glucose to stay in the bloodstream which further leads to health problems over time. The process of aging of the human body leads to impairment of energy homeostasis and abnormalities in carbohydrate metabolism. Aging is also responsible for deficiency of insulin secretion and growing insulin resistance.

The prevalence of both Type 2 diabetes and prediabetes increases with advancing age. There is deficiency of insulin secretion and growing insulin resistance caused by a change

in body composition and sarcopenia. The body's cells are not able to use insulin properly. The risk of this type of diabetes increases with obesity, inactive lifestyle, family history of diabetes, or a history of gestational diabetes. Diabetes in elderly people is often diagnosed with delay due to atypical symptoms (dementia, urinary incontinence) and occurrence of mainly postprandial hyperglycemia. They are also at more risk of cardiovascular disorders and kidney disease.

Symptoms

Diabetes in the elderly can be asymptomatic or have nonspecific symptoms. Symptoms of diabetes may include feeling tired, increased hunger or thirst, losing weight without trying, urinating often, and numbness or tingling in hands or feet. Blurred vision and skin infections, and the body may heal more slowly from cuts and bruises. In people with type 2 diabetes, symptoms often develop slowly and may go unnoticed for a long time. Some people with type 2 diabetes have no symptoms, and they only find out that they develop diabetes-related health problems.

Complications associated with diabetes

- **Comorbidities and geriatric syndromes:** Diabetes is associated with increased risk of multiple coexisting medical conditions in older adults. In addition to the classic cardiovascular and microvascular diseases, a group of conditions termed geriatric syndromes occur at higher frequency in older adults with diabetes and may affect self-care abilities and health outcomes including quality of life
- **Cognitive dysfunction:** Hypoglycemia is linked to cognitive dysfunction in a bidirectional fashion: cognitive impairment increases the subsequent risk of hypoglycemia and a history of severe hypoglycemia is linked to the incidence of dementia
- **Functional impairment:** Aging and diabetes are both risk factors for functional impairment. People with diabetes are less physically active and have more functional impairment. The etiology of functional impairment in diabetes may include interaction between coexisting medical conditions, peripheral neuropathy, vision and hearing difficulty, and gait and balance problems, limiting physical activity and increasing the risk of falls. Other medical conditions that commonly accompany diabetes such as coronary artery disease, obesity, degenerative joint disease, stroke, depression, and visual impairment also negatively impact physical activity and functionality.
- **Falls and fractures:** Normal aging and diabetes are associated with the higher risk of falls and fractures. Women with diabetes have a higher risk of hip and proximal humeral fractures after adjustment for age, BMI, and bone density. Physical therapy should be encouraged in patients who are at high risk or who have experienced a recent fall.
- **Depression:** Diabetes is associated with a high prevalence of depression. Untreated depression can lead to difficulty with self-care and with implementing healthier lifestyle choices associated with a higher risk of mortality in patients with diabetes.

- **Vision and hearing impairment:** Sensory impairments should be considered when educating older adults and supporting their self-care. Hearing impairment involving both high- and low/mid-frequency sound is about twice as prevalent in people with diabetes, and may be linked to both vascular disease and neuropathy.
- **Other commonly occurring medical conditions:** Persistent pain from neuropathy or its inadequate treatment is associated with adverse outcomes in older adults including functional impairment, falls, slow rehabilitation, depression and anxiety, decreased socialization, sleep and appetite disturbances, and higher health care costs and utilization. Urinary incontinence is common in older patients, especially women, with diabetes. In addition to standard assessments and treatments for incontinence, clinicians should remember that uncontrolled hyperglycemia can increase the amount and frequency of urination.

PREVENTION

People who are at a high risk of diabetes can prevent or delay its onset by making some lifestyle changes. This is important as diabetes often leads to various other complications. Some of the changes suggested to prevent diabetes are

- Maintain a healthy weight
- Eat a healthy diet
- Stay active
- Get regular screenings

Supportive care:

Care for diabetes in older adults involves a combination of lifestyle changes, medication, and monitoring for complications:

- **Lifestyle changes:**
 - Avoid large carbohydrate loads at a single meal
 - Gradually increase your physical activity, such as walking, aerobic exercise, and resistance training
 - Improve your dietary protein intake
- **Medication:** You may need to take diabetes pills or insulin injections, or other medications to manage other conditions like high blood pressure and high cholesterol.
- **Monitoring:** You should track your blood sugar and monitor for cognitive impairment.
- **Complications:** You should take steps to prevent microvascular and macrovascular complications.

- **Physical activity:** You should be periodically evaluated for your ability to perform physical activity.
- **Cognitive impairment:** You should be screened annually for cognitive impairment, especially if you have problems with self-care activities

Many studies have shown that adjunctive therapies like hydrocolon therapy and acupuncture are beneficial in management of diabetes. Treatments like HBOT, ozone therapy, lymphatic drainage can help in managing the complications associated with diabetes.

Summary

Diabetes is one of the most common age related conditions. Treatments like HBOT, ozone therapy, lymphatic drainage can help in managing the complications associated with diabetes.

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CHAPTER

Twenty Five

Menopause

Disclaimer: Treatments mentioned in this chapter are only palliative and they are not substitutes for the conventional treatments. Always consult a qualified healthcare provider, or specialist before starting any treatment.

Menopause is the permanent cessation of menses resulting from estrogen deficiency that is not associated with a pathologic process. It is a natural part of aging in women. It is the end of a woman's reproductive, childbearing time. This occurs between the ages of 45 and 56 years in most women. average being around age 51.

Menopause is caused by the loss of ovarian follicular function and a decline in circulating blood estrogen levels. The menopausal transition can be gradual, usually beginning with changes in the menstrual cycle. As women enter the late 30s, their ovaries make less of the hormones that control menstruation (estrogen and progesterone) thus making it harder to become pregnant. In their 40s, menstrual periods may get longer or shorter, heavier or lighter, and happen more often or less often. Over time, ovaries stop releasing eggs and eventually menstruation stops. Menopause can also be a consequence of surgical or medical procedures.

‘Perimenopause’ refers to the period from when the first signs of changes in the menstrual cycle are observed and ends one year after the final menstrual period. This can last for

several years.

Changes associated with menopause

The hormonal changes associated with menopause can affect physical, emotional, mental, and social well-being. The symptoms experienced during and following the menopausal transition vary substantially from person to person. For some, these symptoms can be severe and affect daily activities and quality of life. Some can experience symptoms for several years.

Symptoms associated with menopause include:

- Hot flushes and night sweats
- Changes in the regularity and flow of the menstrual cycle, culminating in cessation of menstruation
- Vaginal dryness
- Sexual dysfunction
- Urinary incontinence
- Difficulty sleeping/insomnia
- Changes in mood, depression, and/or anxiety
- Change in body composition
- Increase in risk of other age related diseases such as cardiovascular disorders and osteoporosis, developing certain types of cancer, including breast and endometrial cancer.

Preventive measures and lifestyle changes for complications of menopause

- Exercise regularly to sleep better and prevent conditions like heart disease, diabetes, and osteoporosis.
- Strengthen your pelvic floor muscles with Kegel exercises to prevent bladder leaks.
- Stay socially and mentally active to prevent memory problems.
- Avoid smoking. Tobacco might cause early menopause and increase hot flashes.
- Limit alcohol consumption, to lower your chance of getting breast cancer and help sleep better.
- Eat a variety of foods and keep a healthy weight to help with hot flashes.
- Practice relaxing techniques like yoga, deep breathing, or massage.

Making these changes can ease the transition to menopause and reduce the risk of complications such as osteoporosis and cardiovascular diseases associated with menopause.

Supportive care:

Menopause is an inevitable process that a woman's body goes through. Therefore, care is about treating the symptoms of menopause that disrupt life.

These treatments can include hormonal replacement therapies and non hormonal treatments like lifestyle changes, seeking psychological help, medications to ease anxiety, depression and sleep better.

Summary

Menopause is a part of a woman's natural aging process. It cannot be prevented but can ease the symptoms that make the menopausal transition challenging. Integrative therapies including hormone therapy, shirodhara, massage therapy, micronutrient therapy, etc work effectively as palliative care for menopausal women.

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CHAPTER *Twenty Six*

Sexual Dysfunction

Disclaimer: Treatments mentioned in this chapter are only palliative and they are not substitutes for the conventional treatments. Always consult a qualified healthcare provider, or specialist before starting any treatment.

Sexuality is an important component of emotional and physical intimacy that men and women experience through their lives. However with advancing age and functional decline, sexual functions may also get affected in both males and females and present in the form of male erectile dysfunction and female sexual dysfunction. These can be caused due to several factors associated with aging such as hormonal changes, changes in neurological and circulatory system, changes in physical abilities, etc. Also, medical conditions that can interfere with sexual function, such as diabetes, atherosclerosis, urinary tract infections, and arthritis, become more common. The extent to which aging affects sexual function depends largely on psychological, pharmacological, and illness-related factors.

Men may be more affected than women by sexual dysfunction.

(A) Sexual Dysfunction In Males

Aging invariably affects sexual activity and sexual dysfunctions in men and is likely to be multifactorial with the development and/or progression of various medical comorbidities

including metabolic, cardiovascular and marital problems. In the aging male, the most common dysfunctions described are lack of desire and erectile problems. These can be due to hormonal changes as part of normal aging or due to underlying conditions such as late-onset hypogonadism, or neurological and vascular disease processes. It should also be recognised that conditions which affect the elderly may have a bearing on sexual activity. For example, chronic illnesses often affect sexual enjoyment indirectly, typically through anxiety and depression; moreover, general disabilities such as pain and stiffness may lead to changes in sexual repertoires.

A good physical health, regular sexual partner and active sexual lifestyle earlier in life often predict the maintenance of sexual activity in old age.

Many medical conditions linked to sexual dysfunction in males:

1. **Cardiovascular disease:** In cardiovascular disease there is endothelial dysfunction leading to changes in the structure of the penile tissues and impaired vascular supply. In cardiac failure, erectile dysfunction may affect up to 80% of men. In patients with hypertension, there is increased prevalence of erectile dysfunction due to endothelial dysfunction, along with structural changes to blood vessels decreasing the flow to the area.
2. **Diabetes mellitus:** Erectile dysfunction is more common in those with a long duration of diabetes, poor glycaemic control, high BMI, smokers and those with diabetic complications. Mechanisms for erectile dysfunction in diabetic men include neuropathy, endothelial dysfunction and smooth-muscle changes. Low levels of Nitric oxide (NO) is common in aging diabetic men and is important for relaxation of penile smooth-muscle, necessary for engorgement of the penis during erection.
3. **Urological conditions:** Those with lower urinary tract symptoms may have an increased smooth-muscle tone, reduced NO in nerves and fibrosis of penile tissue. Treatment of lower urinary tract symptoms may increase the prevalence of ejaculatory disorders. Low desire is a common feature of renal failure.
4. **Depression:** Common types of sexual dysfunction present in aging depressed patients are low desire, delayed ejaculation and erectile dysfunction due to a change in limbic neurotransmitters. They are known to delay ejaculation, and indeed have commonly been used as a treatment for premature ejaculation.
5. **Neurological disorders:** Conditions affecting the neurological system can have a huge effect on sexuality at all ages. decrease in sexual desire due to changes in the brain and spinal tract damage can reduce the ability for sexual arousal, erection and ejaculation. e.g. of these disorders include Stroke and Parkinson's disease.

Prevention of sexual dysfunction in aging males:

Strategies to prevent sexual dysfunction in aging males are as follows:

- Manage chronic health conditions like diabetes, heart disease, and high blood pressure.

- Get regular checkups
- Maintain a healthy lifestyle by eating a healthy diet, exercise regularly, and maintain a healthy weight.
- Avoid smoking and excessive drinking which increases the risk of erectile dysfunction (ED)
- Manage stress
- Take psychological therapy for mental health

Treatment strategies for male sexual dysfunctions in the ageing male

- Screen for chronic medical conditions such as hypogonadism, depression, cardiovascular and metabolic diseases; exclude iatrogenic or reversible causes; and optimise existing medical comorbidities.
- Psychosexual counseling to set realistic outcome goals.
- Clinically manage Erectile dysfunction:
- Testosterone replacement therapy for Sexual libido and hypoactive sexual desire

(B) Sexual Dysfunction In Females

A variety of biological and psychosocial factors are associated with women's sexual health in midlife and older age. Evidence suggests there is a decline in sexual functioning with increasing age and menopausal transition. However, not all women in midlife and older age experience such a decline

Two common changes that older adults experience are that the vagina can shorten and narrow, and the vaginal walls can become thinner and stiffer. For most, there will be less vaginal lubrication. These changes could make certain types of sexual activity, such as vaginal penetration, painful or less desirable. Menopause is another change that may affect sexuality and intimacy in older adults. During a woman's menopausal transition, the desire to have sex may increase or decrease.

Common disorders related to sexual dysfunction and increasing age include cardiovascular disease, diabetes, lower urinary tract symptoms, and depression.

Causes of sexual dysfunction in females

- Age
- Menopause
- Uterine fibroids: Urinary incontinence
- Pelvic floor disorders (eg, childbirth, uterine prolapse)

- Surgery (eg, hysterectomy, oophorectomy, gastric bypass)
- Substance abuse (tobacco, alcohol)
- Diabetes
- Psychosocial issues: Depression, Anxiety
- Cardiovascular disease
- Neurologic or vascular dysfunction
- Obesity
- Hypertension
- Hyperlipidemia
- Multiple sclerosis
- Osteoarthritis
- Pulmonary disease: Renal failure, Liver failure
- Hypothyroidism
- Endometriosis
- Cancer (eg, breast)

Prevention of sexual dysfunction in aging females:

There are many ways to reduce the likelihood of sexual dysfunction in aging females, including:

- Lifestyle changes: Avoid smoking and excessive alcohol, and try to get enough sleep, eat well, and exercise regularly.
- Improve Communication with the partner.
- Decrease stress and relax.

TREATMENT

- **Medication:** People with hormone deficiencies may benefit from hormone shots, pills or creams. Medications can help increase sexual desire or libido. Hormone therapy can help people experiencing low sexual desire due to menopause.
- **Mechanical aids:** Aids such as dilators may help people who experience narrowing of their vaginas due to menopause. Devices like vibrators can be helpful to help improve sexual enjoyment.

- **Sex therapy:** Sex therapists can help people experiencing sexual problems that their primary care provider can't address.
- **Psychotherapy:** Therapy with a trained counselor can help address anxiety, fear, guilt and poor body image.

Some treatments that can help with sexual dysfunction are:

- Hormone therapy
- HBOT
- Ozone therapy
- Pulse shock wave treatment
- Shirodhara
- Yoga and Meditation
- Massage therapy
- Sauna
- Psychological Counselling

Summary

Aging invariably affects sexual functions in both males and females because of hormonal changes, changes in neurological and circulatory system, changes in physical abilities, etc. Sexual dysfunction can be addressed using simple integrative therapies like Hormone therapy, HBOT, ozone therapy, shirodhara, massage therapy, Pulse shock wave treatment, Yoga and Meditation, Massage therapy, Sauna Psychological Counselling, etc.

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SECTION E

**Anti-Aging Treatments
at KLS Wellness Institute**



CHAPTER

Twenty Seven

Our Treatment Program and Protocols

At KLS Wellness, we take pride in offering a range of transformative programs designed to enhance well-being and promote longevity. Our most acclaimed offerings are

- **Anti-Aging & Wellness Integrative Program**, available in both one- and two-week formats
- **Anti-Aging Integrative Program-40 days**

These programs are meticulously crafted to reverse the length of telomeres, slow down aging symptoms and provide a subjective feeling of rejuvenating the body and mind, helping the patient achieve a vibrant, youthful state.

In addition to our anti-aging initiatives, we provide a variety of specialized programs, including:

- **Detox Program:** Purify your body and restore balance.
- **De-Stress Program:** Relieve tension and rejuvenate your spirit.
- **Spine Program:** Focus on spinal health and mobility.

- **Knee Pain Program:** Alleviate discomfort and enhance mobility.

Each program is designed with a unique need in mind, ensuring a holistic approach to wellness that empowers us to live our best life.

To evaluate the beneficial outcome of our anti-aging programs, we use telomere length testing as a biological marker. The telomere length is measured before initiating the treatment and it is measured again at the end of the treatment protocol. Telomere length denotes the biological age of an individual. By comparing the length of telomere before and after the treatment, we can determine if the anti-aging treatment protocol has helped in reducing the biological age. Increase in telomere length indicates decrease in biological age which signifies slowing down of the aging process.

Our clinical results are published in a peer reviewed medical journal which show increased telomere length after the anti-aging program. This positive change reflects improved cellular health, suggesting that our program effectively slows down or even reverses some of the natural processes of aging.

Anti-Aging & Wellness Integrative Program - 1 Week And 2 Week

In today's world, aging is often seen as a negative process. However, with the right approach, we can embrace aging gracefully and maintain a youthful vitality.

The anti aging program at KLS Wellness institute offers a holistic approach that combines the best of modern science with ancient wisdom to help patients look and feel their best at every age. This program focuses on slowing down the aging process thereby reversing the symptoms of aging, rejuvenating cellular health, and enhancing vitality. The best results are obtained in a 40 days anti aging integrative program.

Benefits of Our Program

Participants in our Anti-Aging Program can expect a host of benefits, including:

- Increased energy levels and vitality
- Enhanced cognitive function and memory
- Improved gut health
- Better sleep quality and reduced insomnia
- Strengthened immune system
- Reduced joint pain and improved muscle tone
- Enhanced mood and overall well-being
- Improved skin health and elasticity
- Enhanced sexual function

- **Reduced risk of chronic diseases**

The treatments that we offer at KLS wellness institute are Hyperbaric Oxygen Therapy; Ozone Therapy; Deep tissue mobilization, Different set of naturopathy practices like various kriyas , different set of massages, pain management basti's, shirodhara, etc.; Infrared and Light Sauna sessions; Prism Light Pad treatments; Colon Hydrotherapy with gut cleansing enemas; Flow Presso; Avacen Microcirculation; IV Micronutrient Therapy; Rehabilitation including physiotherapy, Occupational therapy, Psychological counseling; Pain Management modalities; Aquatic Therapy; Yoga and Meditation; complemented by creative and delightful healthy food.

Our dedicated team of physicians and therapists conducts a thorough evaluation of every individual and design a personalized week-long program tailored for their optimal health and fulfillment.

Program Overview

Day of Admission and Initial Evaluation

It begins with a comprehensive pre-treatment assessment, including basic blood investigations like (CBC, ESR, CRP, Renal Function Test, Liver Function Test, Diabetic profile, Lipid profile, Micronutrient levels like Sr Iron levels, SR calcium, Sr magnesium, Sr Vit B12, Sr Vit D, Sr Vitamin folic acid; Sr Homocysteine; hormone levels like Thyroid profile, Sr DHEAs, Sr Cortisol, Female hormones like Sr estrogen, Sr progesterone, Sr Prolactin; Male hormones like Sr Testosterone and Sr PSA. Urine Routine analysis with X Ray imaging of Chest, ECG, 2D ECHO, etc are also done. If the patient has pain in a specific joint we take imaging of that particular region.

Specialized tests like serum telomere analysis, which serves as a biological marker of aging are done to know biological age. A detailed consultation follows, featuring an aging-related questionnaire, a full physical assessment, cardiovascular stress screening, and a cardiac consultation to gauge the overall health of the patient. Body Mass Index (BMI) will also be calculated. Based on these findings, we craft a personalized therapy plan for each of our patients.

Days 2 to Final Day: Therapy Sessions

Over the next five days, the patient is engaged in therapies specifically chosen during their initial consultation and reports received after detailed assessment.. Each treatment is carefully administered daily to maximize its benefits.

Day of Discharge: Post-Therapy Evaluation and Discharge

On the final day (either 7th day or 14 th day), the aging questionnaire is again re-evaluated to assess subjective improvements. We conduct basic investigations (CBC, ESR, LFT, Sr creat, Sr electrolyte, urine RM) and serum telomere analysis once again. The patients are provided with a comprehensive discharge summary detailing their progress, key findings from their tests, and a recap of the therapies experienced throughout the week.

Program Day 1 - Individualized for each patient



Registration



Physiotherapy



Blood and other investigation



Back Massage



Medical Consultation



Infrared Sauna



Hyperbaric Oxygen Therapy



Psychological Counselling



Breathing Ozone through oil



Naturopathy Kriya's



Gut Cleansing with enema



Weight Loss Treatment



Foot Reflexology



Prism Light Pad



Rest in Room



Flow presso



Anti-Ageing Cosmetology



Avacen

Program Day 2 - Day 7



Similar to Day 1 with the additional inclusion of the following



Rehabilitation



**Gut Cleansing
with Hydrocolon
Therapy**



**Full Body
Detox Massage**



Laughter Therapy



Ozone Sauna



Head Massage



Group Activity



Relaxing Massage



Yoga



Shirodhara



Meditation



Face Yoga



**Ozone
through Ear**



Dance Therapy



**Acupressure
Therapy**



**Physiotherapy
Modalities**



Mud Pack



**Robotic Spinal
Decompression
System**

Additionally, we offer recommendations for necessary supplements based on any deficiencies identified, along with lifestyle modification advice and a personalized diet plan to help maintain their progress after their discharge.

PROTOCOL

1-Week Anti-Ageing Program Protocol

Day 1: Comprehensive Assessment and Initial Therapies

- **Medical Consultation:** A thorough examination to evaluate general health, medical history, and any specific conditions that may need attention. A comprehensive health questionnaire is administered to assess symptoms across all bodily systems.
- **Physical Assessment:** To evaluate physical condition, mobility, posture, and muscle tone with vitals check
- **Physiotherapy Assessment:** A detailed analysis of musculoskeletal health, including flexibility, strength, and areas needing rehabilitation.
- **Psychological Assessment:** A session with a psychologist to assess mental well-being, mood, and stress levels.
- **Cardiovascular Screening:** ECG, 2 ECHO, CSS Screening, with cardiologist consultation if required
- **BMI Calculation:** Body Mass Index measurement to assess weight in relation to height and establish any weight-related goals.
- **Investigations:** including basic blood investigations like (CBC, ESR, CRP, Renal Function Test, Liver Function Test, Diabetic profile, Lipid profile, Micronutrient levels like Sr Iron levels, Sr calcium, Sr magnesium, Sr Vit B12, Sr Vit D, Sr Vitamin folic acid; Sr Homocysteine; hormone levels like Thyroid profile, Sr DHEAs, Sr Cortisol, Female hormones like Sr estrogen, Sr progesterone, Sr Prolactin; Male hormones like Sr Testosterone and Sr PSA. Urine Routine analysis with X Ray imaging of the Chest is checked. Specialized test like serum telomere analysis, which serves as a biological marker of aging is also done.

Day 1 - 7 Therapies:

- **Hyperbaric Oxygen Therapy (HBOT):** 10 sessions throughout the week
- **Ozone Therapy:**
 - Rectal: 7 sessions over the week
 - Ear: 7 sessions over the week
 - Breathing through oil: 7 sessions over the week
- **IV Micronutrient Therapy:** One session on day 6 to provide a boost of essential vitamins,

minerals, and antioxidants -

- **Enemas & Colon Hydrotherapy** with dietary modification for 5 days
 - **Oil Enema:** Scheduled 2 days before colon hydrotherapy for lubrication and detoxification.
 - **Herbal Enema:** Administer a day before colon hydrotherapy to cleanse and prepare the colon.
 - **Colon Hydrotherapy:** Scheduled after the enemas to cleanse the intestines.
 - **Diet modification:** The patient is asked to follow a gut detox diet from the day of oil enema for 5 days consisting of fruits, vegetable soups, salad consisting of vegetable, pulses and lentils . Cereals, eggs, chicken , meat, and ham are restricted in this diet plan. The patient is asked to restrict milk tea too as far as possible. Cereals like rice can be added after colon therapy . Patient is asked to have cooked vegetables post colon therapy for the next 2 days post colon therapy.
- **Prism Light Therapy:** 7 sessions throughout the week
- **Avacen :** 7 session throughout the week
- **Infrared Sauna:** One session during the week
- **Ozone Sauna:** One session during the week
- **Naturopathy Therapy:**
 - **Kriyas :** Initiation of daily kriyas, including Jal Neti and eye cups, ect
 - **Daily Massage Therapy:** A rotating schedule for massages to address stress, muscle tension, and detoxification:
 - Day 2: Relaxation Massage
 - Day 3: Deep Tissue Massage
 - Day 4: Acupressure Massage
 - Day 5: Potli Massage
 - Day 6: Hot Stone Massage
 - Day 7: Salt Glow Massage
 - **Shirodhara:** 1 session to balance the mind and body, promoting mental clarity and deep relaxation.
 - **Head Massage & Foot Reflexology:** Alternate day sessions to stimulate nerve endings, improve circulation, and enhance relaxation.

- **Pain basti's (spine basti, janu basti) :** 7 sessions of this therapy are done throughout the week to alleviate joint related pain. This therapy for each patient is decided after initial consultation.
- **Physiotherapy & Rehabilitation:**
 - **Physiotherapy Sessions:** 6 sessions focused on musculoskeletal health as per the initial physiotherapy assessment. We Incorporate physical therapy modalities (such as Ultrasound, TENS, IFT, Pulse shock wave, I Tecar, Class 4 laser, MOBI-L- Robotic and Virtual reality rehab, Robotic decompression system) as needed for pain relief.
 - **Rehabilitation:** Tailored exercises to improve strength, flexibility, and functional ability.
 - **Occupational Therapy:** Sessions as planned by the occupational therapist based on initial assessment.
 - **Psychological Counseling:** Daily mental health support through 5 sessions over the week, focusing on stress management, emotional well-being, and cognitive health.

Yoga & Meditation:

- **Yoga & Meditation:** 3 sessions to promote flexibility, mental clarity, and stress reduction.

Weight Loss (If Applicable):

- **Weight Management Program:** If the initial consultation identifies weight loss as a goal, 6 sessions focusing on physical exercises, dietary modifications, and other strategies like cellulite deep heat therapy, 12 channel, cryolipolysis ect are implemented throughout the week.
 - **Completion and Follow-Up:** on 7 th day, a re assessment is conducted to review progress, adjust any future recommendations, and provide ongoing lifestyle suggestions for maintaining anti-ageing benefits.

ANTI AGEING - 40 days Program

40 days Cellular Anti-Aging Program at KLS Wellness Hospital, consisting of 1-week IPD (In-Patient Department) stay and the remaining duration as OPD (Out-Patient Department) care, the following is a proposed structure:

Our advanced program is designed to reverse telomere shortening while combating the signs of aging. It promotes cellular rejuvenation and enhances overall vitality for a healthier, more youthful life. It integrates advanced medical treatments, nutrition, wellness therapies, and lifestyle management under expert supervision.

Benefits of Our 40 days Program:

- **Boosted energy and vitality:** Individuals can experience a noticeable increase in energy

levels, revitalizing their daily activities and enhancing their overall zest for life.

- Enhanced cognitive function and memory: Cognitive performance is sharpened, leading to improved mental clarity and recall, helping individuals stay focused and alert.
- Optimized gut health: A balanced gut and improved digestive function contribute to better overall health and well-being.
- Superior sleep quality: Restful nights and reduced insomnia allow individuals to wake up feeling refreshed and ready to take on the day.
- Strengthened immune system: The body's defenses are fortified, making it more resilient and better equipped to ward off illnesses.
- Reduced joint discomfort and improved muscle tone: Joint pain is alleviated, and muscle tone is enhanced, promoting greater physical comfort and mobility.
- Enhanced mood and overall wellness: Emotional health is improved, cultivating a brighter outlook on life and an elevated sense of well-being.
- Revitalized skin health: Skin texture, tone, and elasticity are enhanced, leading to a more youthful and radiant appearance, with reduced signs of aging such as wrinkles and fine lines.
- Improved sexual health: Sexual function is heightened, resulting in a more fulfilling intimate life.
- Decreased risk of chronic diseases: The risk of developing chronic conditions is lowered through a healthier lifestyle and targeted wellness strategies.

This comprehensive 40 days program offers a transformative journey towards anti-ageing and wellness, beginning with a 1-week integrative in-patient (IPD) experience, followed by personalized outpatient (OPD) therapies designed to continue your progress for the full duration. The cornerstone of this program is 40 sessions of hyperbaric oxygen therapy, a key treatment in slowing the aging process and promoting cellular rejuvenation. In addition to this, ozone therapy is administered for 20 sessions.

In addition to hyperbaric and ozone therapy, a wide array of holistic treatments is included like various therapeutic massages, infrared and light saunas, ozone sauna, prism light pad therapy, and colon hydrotherapy, Flow Presso, Avacen microcirculation therapy, and IV micronutrient infusions, rehabilitation, pain management, aquatic therapy, yoga, meditation, and more, all aimed at restoring balance to your body and mind.

Program Overview:

Day of Admission and Initial Evaluation

Upon admission, the individual will undergo a comprehensive pre-treatment evaluation,

including routine blood tests and specialized assessments like serum telomere testing, a key biological marker of aging. A detailed consultation will also be conducted, covering an aging-related questionnaire, a full physical examination, cardiovascular stress screening, and cardiac evaluation to assess overall health. Body Mass Index (BMI) will be measured, and based on these findings, a personalized therapy plan will be created specifically for the individual.

Day 2 to Day 7: Therapy Sessions

From Day 2 onwards, the individual will receive a series of tailored therapies, carefully selected based on the initial evaluation. These treatments will be administered daily to ensure maximum benefit, with improvements in symptoms monitored throughout the 7-day stay. On Day 7, the individual will be discharged with guidance on lifestyle modifications and dietary recommendations to help maintain the progress achieved during the cellular anti-ageing program.

Following discharge, outpatient treatments will be planned on a 5-day-per-week basis, starting the next day, to continue supporting the individual's health and well-being.

PROTOCOL

40 days Anti-Ageing Program Protocol

Day 1: Comprehensive Assessment and Initial Therapies

- **Medical Consultation:** A thorough evaluation of overall health, medical history, and any specific concerns.
- **Health Questionnaire:** A detailed assessment of symptoms across all bodily systems.
- **Physical Assessment:** Evaluation of physical condition, mobility, posture, muscle tone, and vital signs.
- **Physiotherapy Assessment:** In-depth analysis of musculoskeletal health, including flexibility, strength, and rehabilitation needs.
- **Psychological Assessment:** A session with a psychologist to evaluate mental health, mood, and stress levels.
- **Cardiovascular Screening:** ECG, 2D ECHO, CSS screening, and cardiologist consultation if needed.
- **BMI Calculation:** Measurement to assess weight relative to height and set any weight-related goals.
- **Comprehensive Lab Investigations:** Includes basic blood tests (CBC, ESR, CRP, renal and liver function tests, diabetic profile, lipid profile), micronutrient levels (iron, calcium, magnesium, vitamin B12, vitamin D, folic acid), homocysteine levels, hormone profiles (thyroid, DHEA, cortisol, estrogen, progesterone, prolactin, testosterone, PSA),

urine analysis, and chest X-ray. A specialized telomere analysis, a biological marker of ageing, is also performed.

Therapies (Day 1 - 7):

- **Hyperbaric Oxygen Therapy (HBOT):** 10 sessions across the week to improve oxygenation at the cellular level.
- **Ozone Therapy:**
 - Rectal: 7 sessions over the week.
 - Ear: 7 sessions over the week.
 - Ozone inhalation through oil: 7 sessions.
- **IV Micronutrient Therapy:** Administered on Day 6 to boost essential vitamins, minerals, and antioxidants.
- **Enemas & Colon Hydrotherapy** with dietary modifications for 5 days.
 - **Oil Enema:** Administered 2 days before colon hydrotherapy for lubrication and detoxification.
 - **Herbal Enema:** Administered a day before colon hydrotherapy to cleanse and prepare the colon.
 - **Colon Hydrotherapy:** Performed after the enemas to deeply cleanse the colon.
 - **Diet modification:** The patient is asked to follow a gut detox diet from the day of oil enema for 5 days consisting of fruits, vegetable soups, salad consisting of vegetable, pulses and lentils . Cereals, eggs, chicken , meat, and ham are restricted in this diet plan. The patient is asked to restrict milk tea too as far as possible. Cereals like rice can be added after colon therapy . Patient is asked to have cooked vegetables post colon therapy for the next 2 days post colon therapy.
- **Prism Light Therapy:** 7 sessions throughout the week to regulate circadian rhythms and enhance vitality.
- **Avacen :** 7 session throughout the week
- **Infrared Sauna:** 1 session during the week to promote detoxification through heat therapy.
- **Ozone Sauna:** 1 session during the week to promote detoxification through heat therapy.

Naturopathy Therapy:

- **Kriyas:** Daily cleansing practices, including Jal Neti and eye cups.
- **Daily Massage Therapy:**

- Day 2: Relaxation Massage
- Day 3: Deep Tissue Massage
- Day 4: Acupressure Massage
- Day 5: Potli Massage
- Day 6: Hot Stone Massage
- Day 7: Salt Glow Massage
- **Shirodhara:** 1 session for mental clarity and deep relaxation.
- **Head Massage & Foot Reflexology:** Sessions on alternate days to enhance circulation, relaxation, and nerve stimulation.
- **Pain basti's (spine basti, janu basti):** 7 sessions of this therapy are done throughout the week to alleviate joint related pain. This therapy for each patient is decided after initial consultation.

Physiotherapy & Rehabilitation:

- **Physiotherapy Sessions:** 6 sessions based on the initial assessment. Advanced physical therapy modalities such as Ultrasound, TENS, IFT, Pulse Shockwave, I Tecar, Class 4 Laser, MOBI-L Robotic & Virtual Reality Rehab, and Robotic Decompression are used for pain relief.
- **Rehabilitation:** Customized exercises to enhance strength, flexibility, and functionality.
- **Occupational Therapy:** Tailored sessions based on the initial assessment to improve daily functiona
- **Psychological Counseling:** 5 sessions throughout the week to address mental health, stress management, and emotional well-being.
- **Yoga & Meditation:** 3 sessions to promote flexibility, mental clarity, and overall stress reduction.
- **Weight Management Program (If Applicable):** If weight loss is recommended, 6 sessions are provided, focusing on physical exercise, dietary adjustments, and treatments such as cellulite deep heat therapy, 12-channel stimulation, and cryolipolysis.
- **Completion and Follow-Up:** On Day 7, a re-assessment is conducted to evaluate progress and make any necessary adjustments to the treatment plan. Lifestyle recommendations for maintaining the anti-ageing benefits are provided. The patient is discharged on the 7th day from inpatient care and returns the following day for an outpatient follow-up.

Protocol which is followed after the discharge:

Patient is asked to come from monday to friday for another 6 weeks

- **Hyperbaric Oxygen Therapy (HBOT):** This is done 5 sessions a week (one session each day)
- **Ozone Therapy:** This therapy is administered in a span of 2 weeks. This will be continued until 20 sessions of ozone therapy is completed
- **IV Micronutrient Therapy:** This is done once a week mostly on a Friday
- **Avacen:** This therapy is continued for 3 more session in consecutive days to complete 10 session
- **Infrared Sauna and Ozone Sauna:** Infrared and ozone sauna is planned alternatively each week for another 6 weeks
- **Naturopathy Therapy:**
 - **Massage Therapy:** This therapy is planned once per week. The patient receives different types of massages every week for next 6 weeks
 - **Shirodhara:** 1 session per week .
 - **Pain basti's (spine basti, janu basti) :** 5 sessions of this therapy are planned per week for 2 more weeks if the joint pain is not alleviated in the previous week.
- **Rehabilitation:**
 - **Physiotherapy Sessions:** 5 sessions per week with modalities can be planned for few more weeks if the musculoskeletal pain still persist Advanced physical therapy modalities such as Ultrasound, TENS, IFT, Pulse Shockwave, I Tecar, Class 4 Laser, MOBI-L Robotic & Virtual Reality Rehab, and Robotic Decompression are used for pain relief.
 - **Occupational Therapy:** 2-3 session per week can be planned if needed depending on each case.
 - **Psychological Counseling:** 1 session per week is planned depending on the case throughout the week to address mental health, stress management, and emotional well-being.
 - **Weight Management Program:** 3 sessions of weight loss machines are planned per week for the rest of the weeks depending on each case. The patient is asked to follow a weight loss diet as advised. The weight and inches are checked per week to see the progress.

OTHER PROGRAMS OFFERED AT KLS WELLNESS INSTITUTE

SPINE PROGRAM

Back pain is a common issue that affects people of all ages, from young adults to seniors. It can manifest in different regions of the spine—cervical (neck), dorsal (upper back), lumbar (lower back), and the tailbone. Causes of back pain vary widely and can include poor posture, muscle strain, injuries, spinal misalignment, or degenerative conditions like arthritis. Cervical pain is often triggered by prolonged use of mobile devices or poor ergonomic habits, while lumbar pain is frequently caused by heavy lifting, sedentary lifestyles, or disc herniation. As we age, the risk of spine degeneration increases, leading to conditions such as spinal stenosis, osteoarthritis, and osteoporosis, which make back pain more chronic and debilitating. In older adults, back pain is often exacerbated by reduced bone density and joint wear, significantly impacting mobility and quality of life.

Conventional treatments for back pain typically include physical therapy, pain medications, and lifestyle changes such as posture correction and exercise. In more severe cases, surgical intervention, including discectomies or spinal fusions, may be recommended to correct structural issues in the spine. However, even after surgery, many individuals continue to experience lingering pain and discomfort. This persistent pain occurs due to factors like nerve damage, scar tissue formation, or the failure to address the underlying causes of inflammation and muscle imbalance. Despite advancements in surgical techniques, the complexity of back pain often requires a more comprehensive, holistic approach to achieve long-lasting relief.

At KLS Wellness Institute, our Comprehensive Spine Pain Program offers a holistic and personalized approach to address spine pain, aiming for long-lasting relief and optimal spine health. We blend modern medical diagnostics with therapeutic interventions to ensure long-term relief and healing. Whether the spine pain is due to injury, degeneration, or structural issues, we craft a treatment plan tailored to each individual need.

Program Overview

- **Detailed Consultation and Assessment**

The spine program begins with an in-depth consultation, where the patient's medical history is carefully reviewed. The focus here is mainly on the onset and duration of back Pain and a thorough physical assessment to identify areas of discomfort and assess mobility, using a pain scale to quantify the severity of the pain.

- **Diagnostic Testing**

To fully understand the underlying cause of the spine pain, a range of diagnostic tests is recommended, including:

- **Blood Investigations:** These tests check for inflammatory markers that may indicate underlying conditions contributing to the pain, as well as deficiencies in micronutrients that could be a factor.
- **Spine Scanogram:** A full-length X-ray of the spine to assess structural alignment and detect any abnormalities.

- **MRI of the Spine:** This provides a detailed view of the spine's structure, helping to identify issues such as disc herniations, nerve impingements, or other conditions that may be contributing to the pain.

• Customized Treatment Plan

Based on the consultation and diagnostic results, a comprehensive treatment plan is created, tailored to the patient's specific condition. The goal is to alleviate pain, improve mobility, and promote long-term spine health. The spine treatment program typically spans 10-15 days, depending on the patient's needs. It includes the following components:

- **Hyperbaric Oxygen Therapy (HBOT):** HBOT improves oxygen supply to injured tissues, promoting healing and reducing inflammation in the affected spinal areas.
- **Ozone Therapy:** This therapy is used to reduce inflammation and pain. It can be administered non-invasively, or through targeted ozone injections at the affected area if necessary.
- **Physiotherapy with Pain Modality:** Personalized exercises designed to strengthen the back, improve posture, and increase flexibility are provided by trained physiotherapists. Pain-relieving modalities such as ultrasound therapy, TENS (transcutaneous electrical nerve stimulation), IFT (interferential therapy), Pulse shock wave therapy, I Tecar, Class 4 laser therapy, hot or cold modalities, ect are included as needed.
- **Robotic Spinal Decompression:** It is a specialized non-invasive treatment that alleviates pressure on spinal discs and nerves, reducing pain and promoting healing.
- **Naturopathy and Alternative Therapies:** Traditional healing therapies are incorporated to complement modern treatments, helping balance the body and promote relaxation:
 - **Spine Basti:** Warm herbal oil is pooled over the painful area of the cervical, dorsal, or lumbar spine to relieve pain and tension.
 - **Back Massage and Potli Swed:** A warm herbal compress therapy enhances circulation and relieves stiffness.
- **Sauna:** Infrared, ozone, and light sauna therapies are used to detoxify the body and reduce inflammation. These treatments offer pain relief by delivering deep tissue heat and improving blood circulation.
- **Prism Light Pad:** Light-based therapies promote healing by stimulating cellular repair and boosting energy levels.
- **Gut Cleansing and Detoxification** through enema and Colon Hydrotherapy: These detoxifying treatments support gut health, aiding in the reduction of inflammatory markers and toxins from the gut that may contribute to spine pain.

- **Avacen :** This is a heat device which improves microcirculation by heating the blood circulation of the hand which is placed in the device. This helps in relieving bodily pain and musculoskeletal inflammation.

• **Re-Evaluation and Follow-Up**

At the conclusion of the program, the patient undergoes a re-evaluation to measure progress. Another physical assessment is conducted, and the pain scale is reassessed. Based on the improvements, a detailed follow-up plan is provided, which may include ongoing physiotherapy, lifestyle recommendations, and preventive strategies to maintain long-term spine health.

Protocol for spine program :

Day 1: Comprehensive Physical Assessment

- **Medical Consultation:** A thorough evaluation of overall health, medical history, and any specific concerns.
- **Physical Assessment:** Evaluation of physical condition, mobility, posture, muscle tone, and vital signs.
- **Physiotherapy Assessment:** In-depth analysis of musculoskeletal health, including flexibility, strength, muscle tone to identify areas of discomfort and assess mobility, using a pain scale to quantify the severity of the pain and rehabilitation needs.
- **Diagnostic Testing including**
 - **Blood Investigations:** The basic blood profile , inflammatory markers and micronutrient levels are studied CBC, ESR, CRP, LFT, RFT, Diabetic profile, RA factor, ANA, Sr Calcium, Sr Vitamin B12, Sr Folic acid, Sr magnesium, Homocysteine levels, Lipid profile, hormone levels based on gender.
 - **Imaging** like Spine Scanogram is advised. MRI of the Spine is advised if case involves disc prolage or nerve impingement or canal stenosis is suspected.

Therapy program from 10-15 days .

- **Hyperbaric Oxygen Therapy (HBOT):** 10 sessions are planned , one session per days for next 10 days to improve oxygenation at the cellular level and decrease pain and inflammatory markers
- **Ozone Therapy:** Through rectum, ear and nose - 10 sessions, one session each day for 10 days .Ozone injections are given paraspinally if required for each individual case.
- **IV Micronutrient Therapy:** Administered once per week to boost essential vitamins, minerals, and antioxidants.
- **Physiotherapy** with pain modalities is given to patients for 10- 15 days consecutively

depending on the need of the case.

- **Enemas & Colon Hydrotherapy** with dietary modifications for 5 days.
 - **Oil Enema:** Administered 2 days before colon hydrotherapy for lubrication and detoxification.
 - **Herbal Enema:** Administered a day before colon hydrotherapy to cleanse and prepare the colon.
 - **Colon Hydrotherapy:** Performed after the enemas to deeply cleanse the colon.
 - **Diet modification:** The patient is asked to follow a gut detox diet from the day of oil enema for 5 days consisting of fruits, vegetable soups, salad consisting of vegetable, pulses and lentils . Cereals, eggs, chicken , meat, and ham are restricted in this diet plan. The patient is asked to restrict milk tea too as far as possible. Cereals like rice can be added after colon therapy . Patient is asked to have cooked vegetables post colon therapy for the next 2 days post colon therapy.
- **Prism Light Therapy:** 10 sessions throughout the whole program
- **Avacen:** 10 sessions throughout the program
- **Infrared Sauna:** 1 session per week to reduce muscle soreness and inflammation and promote detoxification.
- **Ozone Sauna:** 1 session per week to promote oxygenation and reduce toxic load from the body.
- **Naturopathy** treatments like spine basti, massages are done for 7 sessions .

KNEE PAIN PROGRAM

Knee pain can arise from various causes as we age, ranging from simple sprains to more complex conditions like osteoarthritis and autoimmune arthritis, etc. Understanding these underlying issues is crucial, as they can significantly impact mobility and quality of life. Conventional treatments often include physical therapy, medications, and lifestyle modifications; however, in some cases, surgery may be necessary to address persistent pain. Unfortunately, for many individuals, pain continues even after trying these standard interventions, highlighting the need for more targeted approaches.

At KLS Well Institute, we offer a comprehensive 7-day program specifically designed to address knee pain. For patients experiencing grade 1 to 3 conditions, we provide non-invasive treatments aimed at alleviating discomfort and improving function. In cases of moderate to severe knee pain, we also utilize advanced therapies which are minimally invasive such as PRP (platelet-rich plasma) treatments and cellular therapies, which aim to promote healing and regeneration in the affected areas. Our program is tailored to meet the unique needs of each patient, ensuring the best possible outcomes.

Program overview

- **Detailed Consultation and Assessment**

The knee program begins with an in-depth consultation, where the patient's medical history is carefully reviewed. The focus here is mainly on the onset and duration of knee pain and a thorough physical assessment and pain scale to identify areas of discomfort and assess mobility, using a pain scale to quantify the severity of the pain.

- **Diagnostic Testing**

To fully understand the underlying cause of the knee pain, a range of diagnostic tests is recommended, including:

- **Blood Investigations:** These tests check for inflammatory markers that may indicate underlying conditions contributing to the pain, as well as deficiencies in micronutrients that could be a factor.
- **Xray knee :** A X-ray of the knee whether unilateral or bilateral is done in AP and Lateral view to assess structural alignment and detect any abnormalities.
- **MRI of the knee:** This is asked if required if ligament or tendon injury is suspected that may be contributing to the pain.

- **Customized Treatment Plan**

Based on the consultation and diagnostic results, a comprehensive treatment plan is created, tailored to the patient's specific condition. The goal is to alleviate pain, improve mobility, and promote long-term knee health. The knee treatment program typically spans 7-10 days, depending on the patient's needs. It includes the following components:

- **Hyperbaric Oxygen Therapy (HBOT):** HBOT improves oxygen supply to injured tissues, promoting healing and reducing inflammation in the affected spinal areas.
- **Ozone Therapy:** This therapy is used to reduce inflammation and pain. It can be administered non-invasively, or through targeted ozone injections at the affected area if necessary.
- **Physiotherapy with Pain Modality:** Personalized exercises designed to strengthen the back, improve posture, and increase flexibility are provided by trained physiotherapists. Pain-relieving modalities such as ultrasound therapy, TENS (transcutaneous electrical nerve stimulation), IFT(interferential therapy), Pulse shock wave therapy, I Tecar, Class 4 laser therapy, hot or cold modalities, ect are included as needed.
- **Naturopathy and Alternative Therapies:** Traditional healing therapies are incorporated to complement modern treatments, helping balance the body and promote relaxation:
 - **Janu Basti:** Warm herbal oil is pooled over the knee joint to relieve pain and tension.

- **Leg Massage and Potli Swed:** A warm herbal compress therapy enhances circulation and relieves stiffness.
- **Sauna:** Infrared, ozone, and light sauna therapies are used to detoxify the body and reduce inflammation. These treatments offer pain relief by delivering deep tissue heat and improving blood circulation.
- **Prism Light Pad:** Light-based therapies promote healing by stimulating cellular repair and boosting energy levels.
- **Gut Cleansing and Detoxification through enema and Colon Hydrotherapy:** These detoxifying treatments support gut health, aiding in the reduction of inflammatory markers and toxins from the gut that may contribute to spine pain.
- **Avacen :** This is a heat device which improves microcirculation by heating the blood circulation of the hand which is placed in the device. This helps in relieving bodily pain and musculoskeletal inflammation.
- **Re-Evaluation and Follow-Up**

At the conclusion of the program, the patient undergoes a re-evaluation to measure progress. Another physical assessment is conducted, and the pain scale is reassessed. Based on the improvements, a detailed follow-up plan is provided, which may include ongoing physiotherapy, lifestyle recommendations, and preventive strategies to maintain long-term benefit.

Protocol for knee program :

Day 1: Comprehensive Physical Assessment

- **Medical Consultation:** A thorough evaluation of overall health, medical history, and any specific concerns.
- **Physical Assessment:** Evaluation of physical condition, mobility, posture, muscle tone, and vital signs.
- **Physiotherapy Assessment:** In-depth analysis of musculoskeletal health, including flexibility, strength, muscle tone to identify areas of discomfort and assess mobility, using a pain scale to quantify the severity of the pain and rehabilitation needs.
- **Diagnostic Testing including**
 - **Blood Investigations:** The basic blood profile , inflammatory markers and micronutrient levels are studied CBC, ESR, CRP, LFT, RFT, Diabetic profile, RA factor, ANA, Sr Calcium, Sr Vitamin B12, Sr Folic acid, Sr magnesium, Homocysteine levels, Lipid profile, hormone levels based on gender.
 - **Imaging** like knee x rays are advised. MRI of the knee is advised if needed.
- Therapy program from 7-10 days.

- **Hyperbaric Oxygen Therapy (HBOT):** 10 sessions are planned to improve oxygenation at the cellular level and decrease pain and inflammatory markers
- **Ozone Therapy:** Through rectum, ear and nose - 10 sessions. Ozone injections are given para articular if required for each individual case.
- **IV Micronutrient Therapy:** Administered once per week to boost essential vitamins, minerals, and antioxidants.
- **Physiotherapy** with pain modalities is given to patients for 7-10 days consecutively depending on the need of the case.
- **Enemas & Colon Hydrotherapy** with dietary modifications for 5 days.
 - **Oil Enema:** Administered 2 days before colon hydrotherapy for lubrication and detoxification.
 - **Herbal Enema:** Administered a day before colon hydrotherapy to cleanse and prepare the colon.
 - **Colon Hydrotherapy:** Performed after the enemas to deeply cleanse the colon.
 - **Diet modification:** The patient is asked to follow a gut detox diet from the day of oil enema for 5 days consisting of fruits, vegetable soups, salad consisting of vegetable, pulses and lentils . Cereals, eggs, chicken , meat, and ham are restricted in this diet plan. The patient is asked to restrict milk tea too as far as possible. Cereals like rice can be added after colon therapy . Patient is asked to have cooked vegetables post colon therapy for the next 2 days post colon therapy.
- **Prism Light Therapy:** 10 sessions throughout the whole program
- **Avacen :** 10 sessions throughout the program
- **Infrared Sauna:** 1 session per week to reduce muscle soreness and inflammation and promote detoxification.
- **Ozone Sauna:** 1 session per week to promote oxygenation and reduce toxic load from the body.
- **Naturopathy** treatments like janu basti, leg massages and full body massages to relax the whole body are done for 7 sessions .
- At the end of the program reassessment is done to evaluate the symptoms .

Detox Program

Detoxification, or detox, is the body's natural process of eliminating harmful substances that accumulate from sources like food, environmental pollutants, and stress. These toxins can interfere with normal bodily functions and negatively affect overall health. A detox program supports the body's innate ability to cleanse itself, enhancing the function of vital

organs such as the liver, kidneys, and lymphatic system. In today's world, where exposure to toxins is unavoidable, detoxification is crucial for maintaining long-term health and vitality. Accumulated toxins can lead to fatigue, digestive issues, skin problems, brain fog, and a weakened immune system. A well-designed detox program helps the body reset and restore balance, resulting in increased energy, improved digestion, clearer skin, and enhanced mental clarity. Regular detoxing can also prevent chronic illnesses and promote overall well-being.

The detox program at KLS involves adopting a holistic approach that typically includes a specific dietary regimen, detox massages, sauna sessions, therapies like enemas and colon hydrotherapy. These treatments work together to promote the removal of toxins, boost energy levels, and enhance physical and mental well-being.

Benefits

- **Boosted energy levels and vitality:** Cleansing the body enhances overall energy and physical well-being.
- **Improved cognitive function and memory:** Detoxing sharpens mental clarity and strengthens memory.
- **Better gut health:** Promotes a healthier digestive system and balanced gut flora.
- **Enhanced sleep quality and less insomnia:** Helps achieve deeper, more restful sleep with fewer disruptions.
- **Stronger immune system:** Supports the immune system, making it more effective against illness.
- **Reduced joint pain and better muscle tone:** Eases inflammation, improving joint comfort and muscle condition.
- **Improved mood and emotional balance:** Helps regulate mood, reducing stress and boosting emotional well-being.
- **Healthier skin and improved elasticity:** Detoxing leads to clearer, more youthful-looking skin.
- **Improved sexual health:** Enhances hormonal balance, improving sexual function.
- **Lower risk of chronic diseases:** Reduces the chances of developing conditions like heart disease or diabetes.

Detox program overview:

The Detox Program is a structured three-day outpatient visit designed to initiate the body's detoxification process. The patient is asked to follow a specific diet for 5 days from day 1 of the detox program. By incorporating specific therapies and dietary modifications, this program supports overall health and well-being.

Dietary Modifications: Participants follow a tailored dietary regimen for five days, beginning on Day 1, to aid the detox process and maximize the effectiveness of the treatments. This consists of fruits, vegetable soups, salad consisting of vegetables ,pulses and lentils . Cereals, eggs, chicken , meat, and ham are restricted in this diet plan. The patient is asked to restrict milk tea too as far as possible. Cereals like rice can be added after colon therapy. Curd or yogurt aids in restoring natural flora post colon therapy. Patient is asked to have cooked vegetables post colon therapy for the next 2 days.

Protocol :

Day 1: A detailed consultation is conducted with the patient and contraindications are ruled out .

- **Detox Massage & Infrared Sauna:** The program begins with a detox massage, stimulating circulation and promoting relaxation. This is followed by an infrared sauna session, which helps the body eliminate toxins through sweat.
- **Oil Enema:** A gentle oil enema is administered to reduce bloating and support digestive health by aiding in the removal of waste.
- **Detox diet:** The patient is put on a detox diet consisting of fruits, vegetables , soups , salad, boiled pulses. Cereals, non vegetarian food, milk , artificial sugars, and processed food have to be avoided in the diet. If a patient is diabetic we allow a small portion of dal rice or dal khichdi without spices and chillies.

Day 2:

- **Detox Massage & Ozone Sauna:** The second day includes another detox massage, followed by an ozone sauna session that improves oxygen utilization and promotes deeper detoxification.
- **Herbal Enema:** An herbal enema is given to cleanse the rectal mucosa, easing the process of colon hydrotherapy and enhancing gut health for natural detoxification.
- **Detox diet :** The patient has to follow the diet which has been followed on day 1 of detox program.

Day 3:

- **Hydro Colon Therapy:** The final day features a hydro colon therapy session, where warm, purified water gently flushes out toxins and waste from the colon, promoting better digestion and improving overall health.
- **Detox diet.** The diet is followed until colon therapy. Post hydro colon therapy , the patient is advised to have food rich in pre-pro biotics like curd, yogurt, buttermilk, and curd rice. The patient will still follow a diet for another 2 days post colon therapy. They are asked not to have raw vegetables but instead they can have it slighted sauted or cooked vegetables. They will still have to avoid artificial sugars, spices, chillies, processed food and nonvegetarian food for 2 more days .

De-Stress Program:

De-stressing is the process of alleviating physical and mental stress to restore balance and promote relaxation. Chronic stress can lead to various health issues, so engaging in de-stressing techniques is essential for overall well-being..

WHY De-stressing?

De-stressing is crucial for maintaining both physical and mental health. Chronic stress can lead to various health problems, including anxiety, depression, cardiovascular issues, and a weakened immune system.

Effective methods include deep breathing exercises, physical activity like yoga or walking, mindfulness and meditation practices, spending time in nature, pursuing hobbies, connecting with loved ones, ensuring adequate sleep, and utilizing relaxation therapies such as massage or aromatherapy.

De-Stressing Program (5-Day OPD Visit)

The de-stress program is a five-day concentrated experience that provides tailored support to promote relaxation and well-being. During the initial consultation, the patient's physical ailments and emotional disturbances are thoroughly assessed. This helps the physician determine if the de-stress program should be complemented with additional treatments for maximum effectiveness.

Program Overview: Day 1 to Day 5

- **Massage Therapy**

Over the course of five days, participants receive massages designed to relieve muscle tension, enhance circulation, and promote relaxation. Therapeutic techniques such as Swedish, deep tissue, and aromatherapy are used to cater to individual preferences and needs. These massages not only alleviate soreness but also significantly reduce stress levels, contributing to physical and mental well-being.

- **Shirodhara**

Complementing the massage therapy, Shirodhara—a traditional Ayurvedic treatment—involves a continuous stream of warm herbal oil poured onto the forehead, targeting the third eye (Ajna) chakra. This technique induces deep relaxation, quiets the mind, and helps alleviate anxiety. Shirodhara is particularly effective for those suffering from insomnia, headaches, and stress-related issues.

- **Meditation**

Meditation is incorporated into the program as a complementary technique to cultivate mindfulness and mental clarity. This practice helps to further reduce stress, increase self-awareness, and promote inner peace.

- **Psychological Counseling**

To ensure emotional balance, psychological counseling is also integrated into the de-stress program if the case demands. This approach allows individuals to address emotional challenges, cope with stress more effectively, and develop healthier mental habits.

Together, these therapies—Massage, Shirodhara, complemented by need-based meditation, and psychological counseling—create a comprehensive approach to de-stressing, fostering both physical relaxation and mental tranquility, while slowing the effects of aging and enhancing overall vitality.

Protocol for De-stress program.

Day 1- detailed consultation , physical and psychological assessment.

Relaxation massage and shirodhara

Day 2- 5 - Different set of massages like acupressure massage, swedish massage, hot stone massage, aroma massage are given from 2nd to 5 th day followed by Shirodhara each day

Meditation and counseling sessions are conducted if the physician decides to add it in the program as a part of the treatment depending on individual case needs.

Summary

At KLS Wellness Institute, various Anti-Aging & Wellness Integrative programs are offered ranging from 1 week to 40 days. These programs combine several state-of-the-art treatments that enhance well-being and promote longevity. These programs are meticulously crafted to increase the length of telomeres, slow down the aging process and rejuvenate the body and mind, helping the patient achieve a vibrant, youthful state.

CHAPTER *Twenty Eight*

Published Results on Beneficial Effects of Anti-Aging Integrative Therapy on Cellular Aging

Our publication titled *“Evaluating the Impact of Anti-Aging Integrative Therapy on Cellular Aging and Quality of Life”* was recently published in the International Journal of Science and Research.

In this study, we analyzed the effects of anti-aging integrative therapies conducted by KLS Wellness Institute & Neurogen Annexe Hospital on 36 adults. The effect of this treatment protocol was assessed using telomere length as a biomarker along with change in common aging symptoms. It was observed that 35 out of 36 individuals showed increased telomere length.

Details of the Study:

The therapy included a combination of Hyperbaric oxygen therapy (HBOT), ozone therapy, colon hydrotherapy, infrared and ozone sauna, IV micronutrients, massages and rehabilitation. In addition to this, patients were also given a healthy and balanced diet. These therapies focus on increasing oxygenation of cells, reducing oxidative stress, detoxification, and most importantly, lengthening of telomeres.

36 patients underwent the anti-aging integrative treatment, out of which 24 were females and 12 were males. The age range of the study group was 40-85 years. Some of the patients had comorbidities, such as diabetes mellitus, hypertension, hypothyroidism, rheumatoid arthritis, etc. (Table 1).

Demographic Data of the study group		
Total No. of patients		36
Gender	Male	12
	Female	24
Age Range	40-50	7
	50-60	12
	60-70	8
	70-80	5
	80 and above	4
Comorbidities	Diabetes Mellitus	10
	Hypertension	17
	Hypothyroidism	6
	Ischemic heart disease	3
	Eczema	1
	Recurrent cystitis	1
	Insomnia	1
	Benign prostatic hyperplasia	1
	Parkinson's disease	1
	Arthritis	1
	Hypoplastic Thrombocytopenia	1

Table 1: Demography of patients

Results of the Study:

Symptomatic changes

After the anti-aging integrative treatment protocol, at discharge, no major adverse events were observed. Patients showed improvements in various symptoms such as energy levels, memory issues, mood swings, exertional dyspnea, sleep issues, joint pain, cramps in the limbs, bloating, acidity, loss of appetite, urinary incontinence, skin laxity, skin dryness, hair fall, etc. (Table 2) (Fig 1).

Symptoms	No. of patients Affected	No. of patients Improved	Percentage Improved (%)
Energy Levels	31	31	100
Memory Issues	21	15	71.43
Mood Swings	13	10	76.92
Exertional Dyspnea	18	16	88.89
Sleep Issues	15	12	80
Joint pain	25	22	88.00
Cramps	20	20	100
Bloating	22	20	90.91
Acidity	20	20	100
Appetite	11	10	90.91
Urinary Incontinence	13	9	69.23
Skin Dryness	25	25	100
Skin Laxity	24	11	45.83
Hair Fall	22	14	63.64

Table 2: Percentage analysis of Symptomatic improvements seen in patients after anti-aging integrative treatment

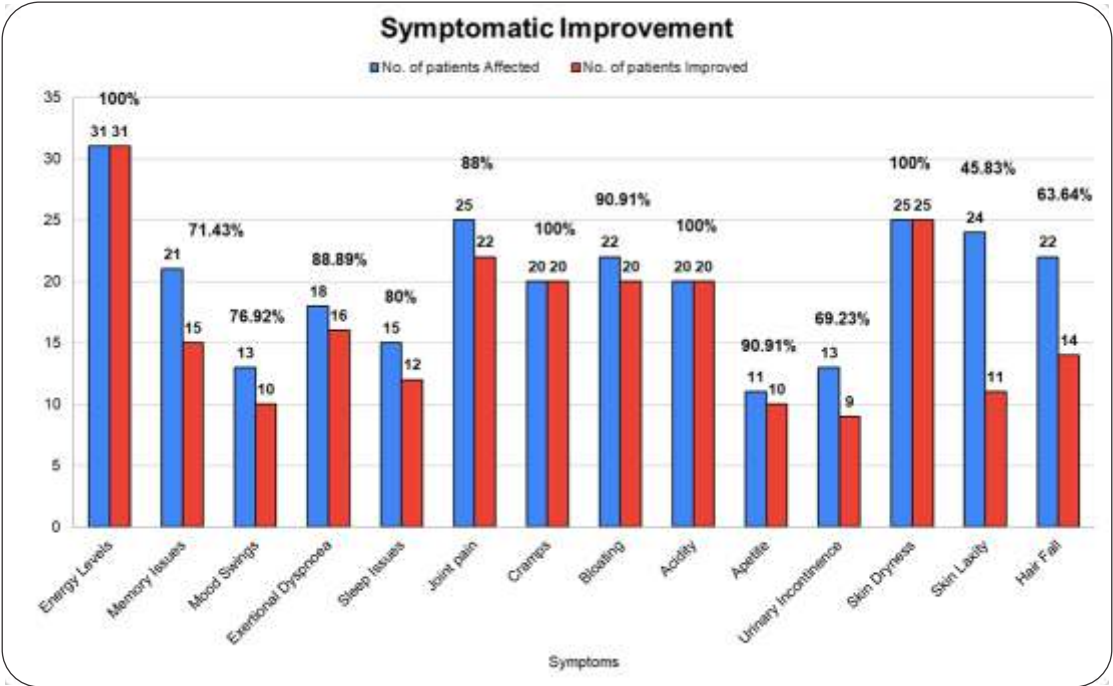


Fig 1: Graph representing improvement in symptoms after anti-aging integrative therapy

Telomere length

The telomere length of patients before and after integrative therapy were tested. (Fig 2). 35 out of 36 (97.22%) patients showed increased telomere length (Fig 3). The telomere length increased by an average of 0.43 ± 0.30 Kbp. The most increase of telomere length was noted to be 1.4 Kbp. In 1 patient, there was no change in telomere length. On statistical analysis, the difference in the telomere length before and after treatment was found to be statistically significant (p -value<0.05) (Table 3)

34 out of 36 (94.44%) patients showed reduced biological age after treatment (Fig 3). The biological age of these patients reduced by 3.8 ± 3.08 years on an average, with the most reduction in biological age being 17 years. In 2 patients, biological age was not reduced at all (Fig 4). On statistical analysis, the difference in the biological age before and after treatment was found to be statistically significant (p -value<0.05) (Table 3)

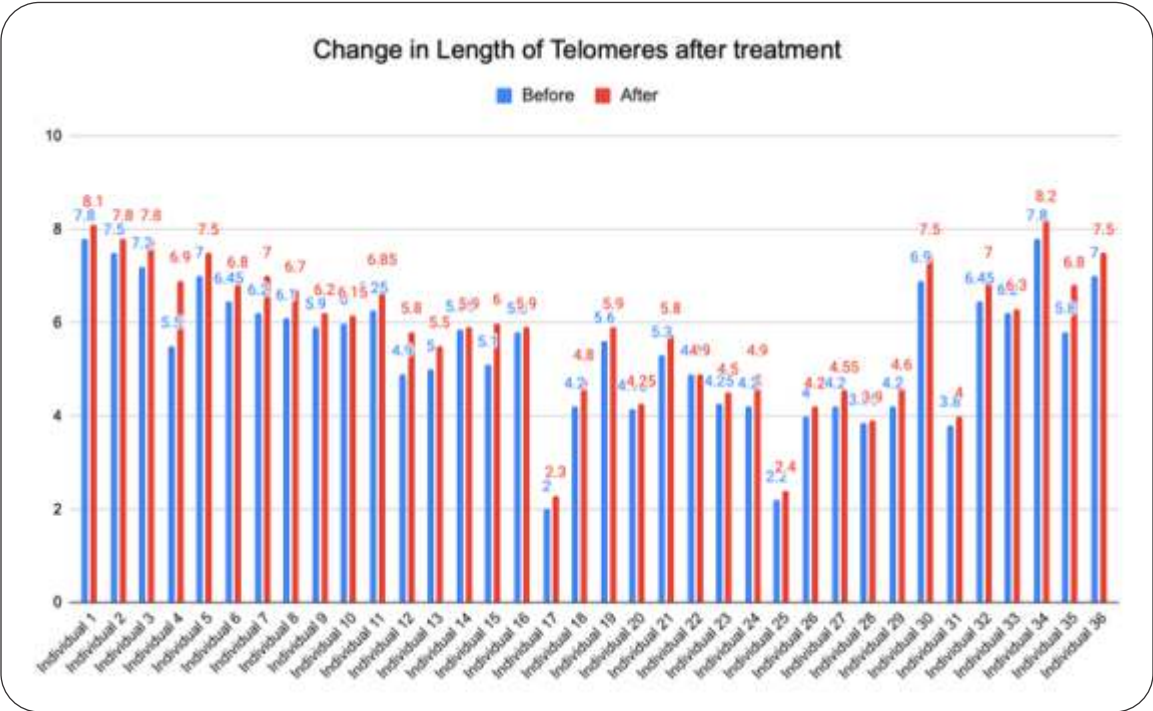


Fig 2: Graph representing change in telomere length after anti-aging integrative therapy in 35 out of 36 individuals enrolled in the study.

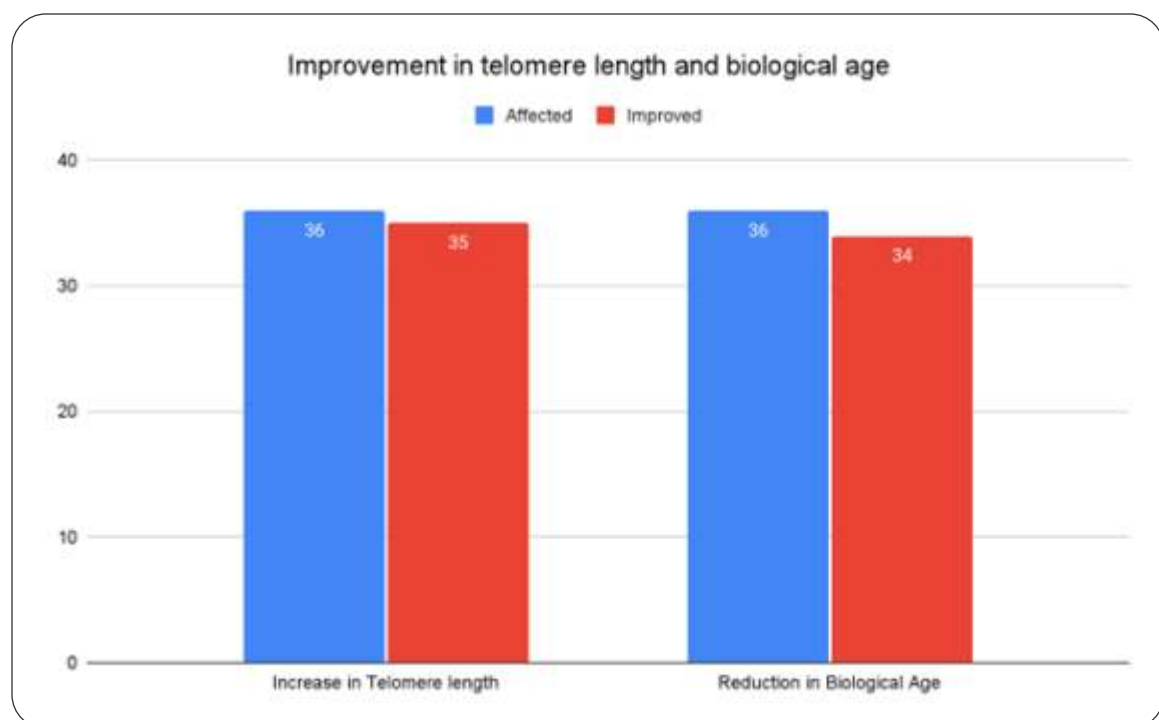


Fig 3: Graph representing improvement in telomere length and biological age

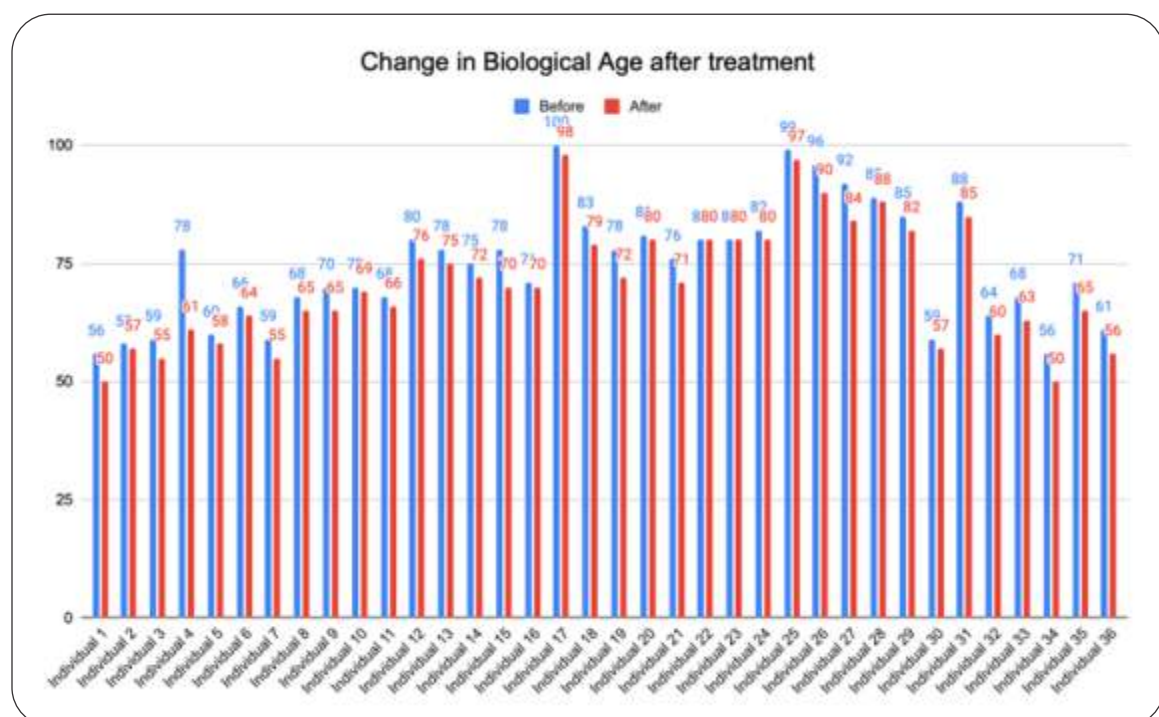


Fig 4: Graph representing reduced biological age in 34 out of 36 individuals enrolled in the study.

Measurement	Pre mean	Post mean	P-value	Significance
Increase in Telomere length	5.43	5.86	0.025	Significant
Reduction in Biological Age	74.5	70.69	0.000	Significant

Table 3: Statistical analysis of Increase in telomere length and reduction in biological age of all patients after treatment

Safety:

There were no side effects reported by any patient after the therapy. Therefore, the anti-aging therapies used in this study were safe as well as beneficial.

Conclusion:

This study demonstrated that anti-aging therapies help in managing and alleviating biological, behavioral, physiological, psychological, and other changes associated with aging. The therapies have a cumulative positive effect on aging which in this study was shown by the increase in telomere lengths and decrease in biological age of the individuals. 97.22% patients showed an increase in telomere length and 94.44% patients showed reduced biological age after treatment. These improvements were found to be statistically significant. Additionally, there were improvements recorded in the majority of the aging symptoms. Therefore, these results indicate that anti-aging integrative therapy has the potential to reverse aging symptoms, cellular aging and improve quality of life.

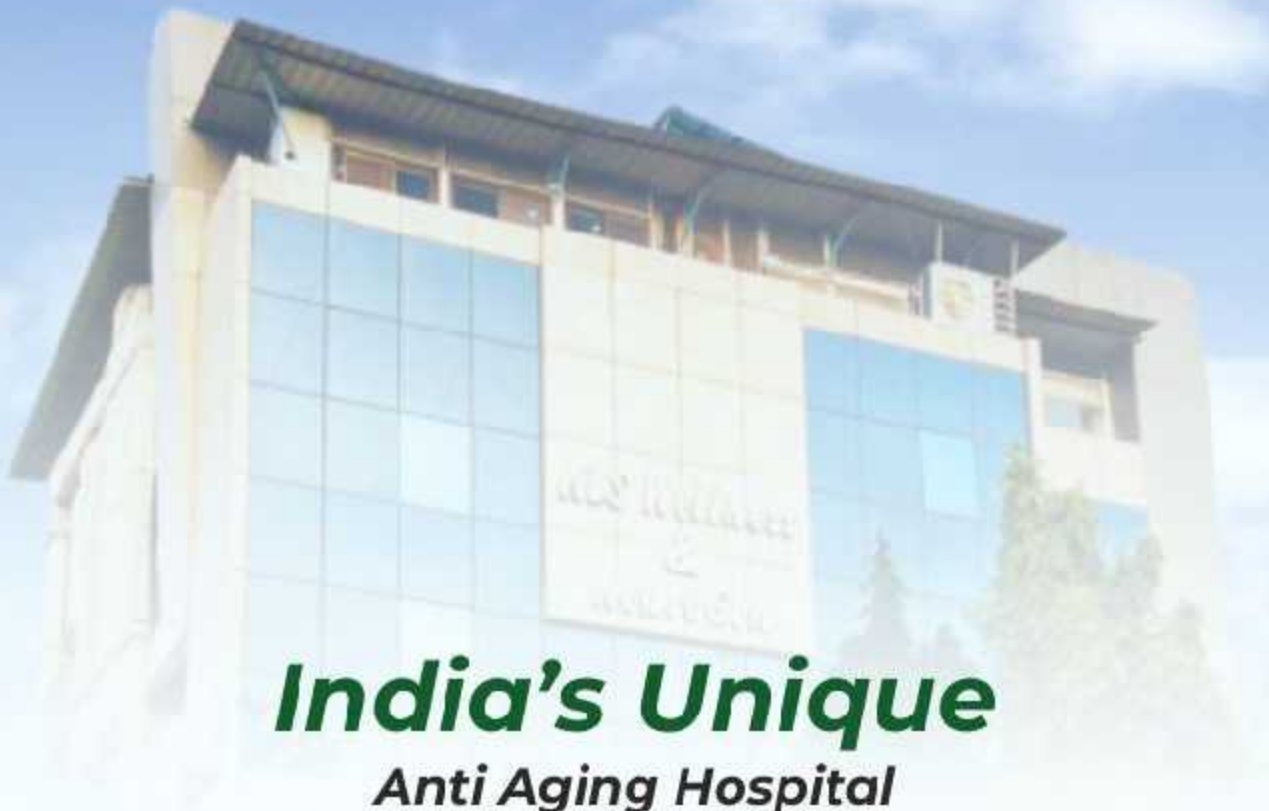
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Link: <https://www.ijsr.net/getabstract.php?paperid=SR24928103739>

Summary

A clinical study was published by the KLS Wellness Institute demonstrating the beneficial effects of their anti-aging therapies. The study reported an increase in telomere length and decrease in biological aging, that is cellular age after treatment further indicating reversing of aging symptoms and cellular aging and improvement of quality of life.



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