

Age Reversal with Hormones, Exosomes & Stem Cells

BY CLARK HANSEN, NMD

FOR PEOPLE UNLIMITED 2/22/2020

Dr. Clark Hansen, NMD

- ▶ April, 1981 – Bachelor of Science in Biology - Brigham Young University, Provo, UT
- ▶ June 1986 – N.M.D. - John Bastyr College of Naturopathic Medicine, Doctor of Naturopathic Medicine, Seattle, WA
- ▶ 1986-1988 – Associate Physician, Holistic Health Center, Scottsdale, Arizona
- ▶ 1988-Present – Founder & President of the Arizona Institute of Natural Medicine, now the Hansen Clinic of Natural Medicine, Scottsdale, Arizona
- ▶ 1992 – Advisory Board of the Southwest College of Naturopathic Medicine, Tempe, Arizona
- ▶ March 10, 2013 Diplomat of Anti-Aging Medicine, World Society of Anti-aging Medicine, Brussels, Belgium
- ▶ 2017, 2018, 2019 Voted Top Naturopathic Doctor of Southwest US
- ▶ Member of the AZNMA, AANP, WOSAM, WOSIAM, A4M

What is Naturopathic Medicine



- ▶ Hippocrates, the Father of medicine, taught that illness was the result of an imbalance of the body's homeostatic and defense mechanisms. The natural state of the human organism is health. True healing comes through creating or restoring physical, biochemical, mental, emotional, and spiritual balance.

Regenerative Medicine

Regenerative Medicine is an emerging new branch of medicine that uses Peptides, Exosomes, Cytokines, Stem Cells and other biological agents made by the human body to supplement, repair or replace aging, damaged or diseased body tissues and cells.



The Promise of Regenerative Medicine

“Regenerative Medicine can offer what drugs
and surgery simply cannot:
the natural enhancement of the ability of the
body to restore and heal itself.”

The Promise of Regenerative Medicine

*“This is no longer the stuff of science fiction.
We’re at the beginning of a paradigm change in medicine
with the promise of being able to facilitate regeneration of
parts of the human body,*

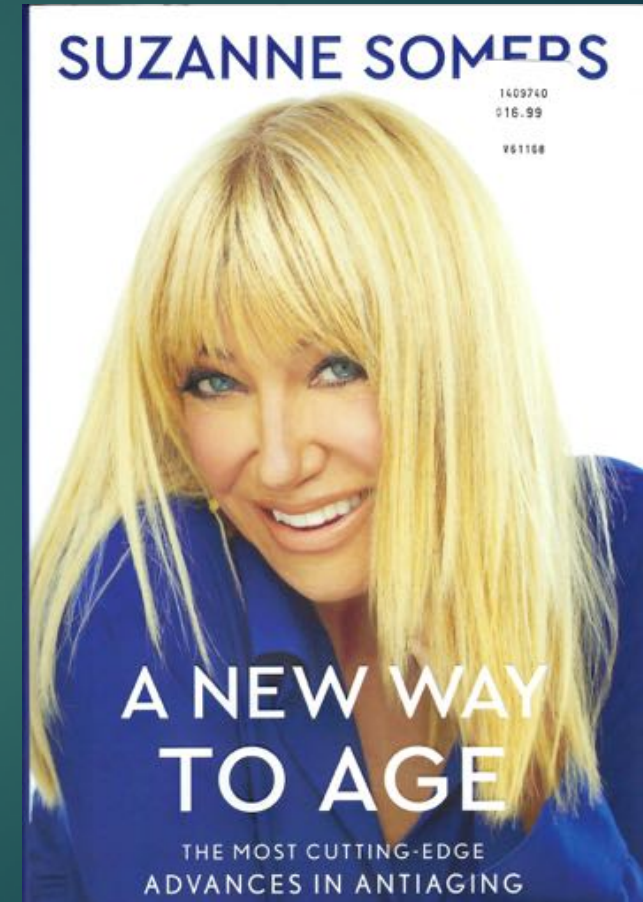
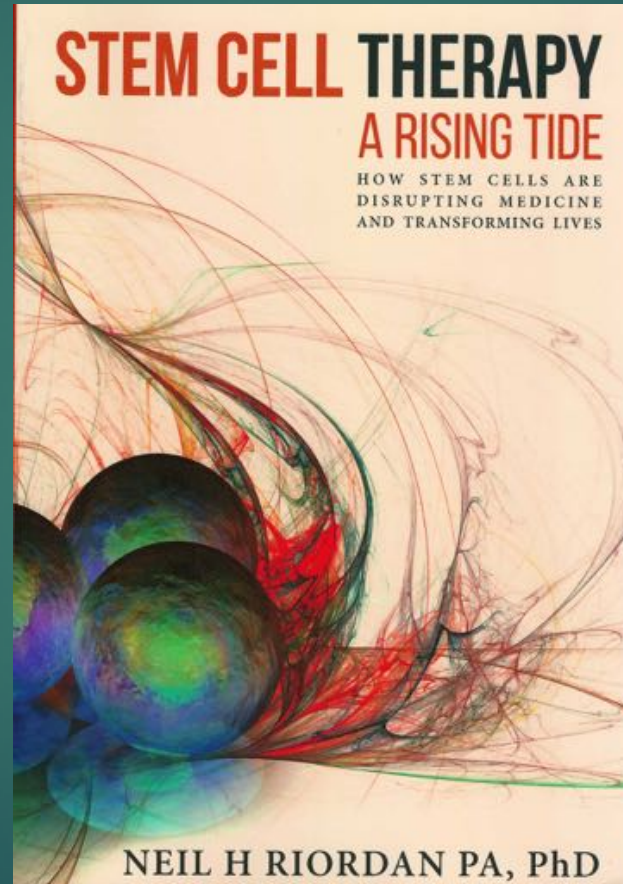
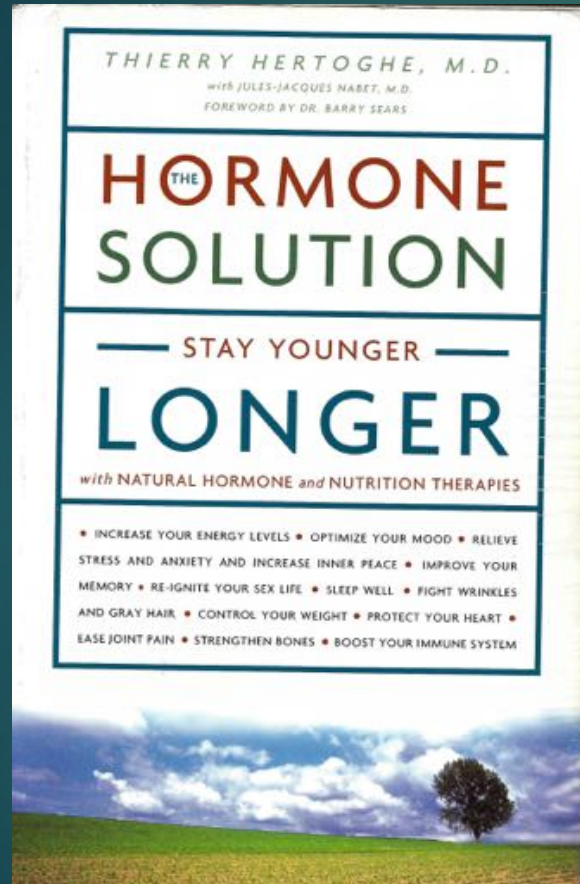
The Promise of Regenerative Medicine

*where adult stem cells can generate replacements
for cells that are lost to injury or disease.*

*This is the practical promise of modern applications
of regenerative medicine.”*

FDA Commissioner Scott Gottlieb, M.D.

Anti-Aging Books



Anti-Aging Resources



The screenshot shows the homepage of DrHansen.com. At the top left is the logo "DrHansen.com" with a green leaf icon above the "n". To the right of the logo is a dark button that says "Call Today! (480) 991-5092" and another dark button that says "SCHEDULE AN APPOINTMENT". To the right of these buttons are four circular social media icons: Facebook, YouTube, Instagram, and a generic share icon. Below this is a green navigation bar with white text links: "HOME", "CLINIC", "SERVICES" (with a dropdown arrow), "SHOP", "ARTICLES", "VIDEOS", "FINANCING", and "CONTACT". The main content area features a large image of a woman with her arms raised in a gesture of joy or health. Overlaid on this image is the text "From weight loss to stem cell therapy, natural supplements to energize your life." and a "View Services" button. Below the image, on the left, is a "Welcome to the Hansen Clinic of Natural Medicine" section with a sub-headline and a paragraph of text. On the right is a smaller version of the DrHansen.com logo with the tagline "Welcome to Wellness".

DrHansen.com

Call Today! (480) 991-5092

SCHEDULE AN APPOINTMENT

HOME CLINIC SERVICES SHOP ARTICLES VIDEOS FINANCING CONTACT

From weight loss to stem cell therapy, natural supplements to energize your life.

View Services

Welcome to the Hansen Clinic of Natural Medicine

Safe and affordable healthcare can be found in Naturopathic Medicine. Dr. Hansen approaches wellness through natural remedies, building a foundation of vitality through herbal supplements and vitamins.

At our clinic, it's all about prevention.

DrHansen.com —Welcome to Wellness—

Anti-Aging Resources



The image shows a screenshot of the DrHansen.com website. The header features the logo 'DrHansen.com' with a green leaf icon above the 'n'. To the right, there is a call-to-action 'Call Today! (480) 991-5092' and a button 'SCHEDULE AN APPOINTMENT'. Below these are social media icons for Facebook, YouTube, LinkedIn, and a general share icon. A green navigation bar contains the following menu items: HOME, CLINIC, SERVICES (with a dropdown arrow), SHOP, ARTICLES, VIDEOS, FINANCING, and CONTACT. The main content area has a white background with a green border. It features a large heading 'Welcome to the Hansen Clinic of Natural Medicine' followed by a paragraph: 'We listen, guide, and work together with you to remove any factors impeding healing and provide essential nutrients to support and stimulate your body's ability to heal itself. Dr. Hansen helps you take charge of your health by correct underlying causes of disease, healing current symptoms, preventing chronic diseases, and empowering you to reach optimal levels of health and vitality.' Below this, there are two columns. The left column is titled 'Your First Visit' and contains two paragraphs: 'On your first visit Dr. Hansen will review your history and symptoms, and perform a physical exam in order to identify underlying causes of disease.' and 'Specific lab tests may also be prescribed to determine the cause of your disease and assess current levels of essential nutrients, hormones and important bio-markers of current and future disease.' The right column is titled 'What to Bring' and contains a numbered list: '1. Completed New Patient Forms', '2. Pertinent medical records, lab tests, etc. you have.', '3. Current medications, dosage, and strength.', and '4. All current nutritional and herbal supplements.' At the bottom of the right column is a green button labeled 'NEW PATIENT FORMS'.

DrHansen.com

Call Today! (480) 991-5092

SCHEDULE AN APPOINTMENT

HOME CLINIC SERVICES ▾ SHOP ARTICLES VIDEOS FINANCING CONTACT

Welcome to the Hansen Clinic of Natural Medicine

We listen, guide, and work together with you to remove any factors impeding healing and provide essential nutrients to support and stimulate your body's ability to heal itself. Dr. Hansen helps you take charge of your health by correct underlying causes of disease, healing current symptoms, preventing chronic diseases, and empowering you to reach optimal levels of health and vitality.

Your First Visit

On your first visit Dr. Hansen will review your history and symptoms, and perform a physical exam in order to identify underlying causes of disease.

Specific lab tests may also be prescribed to determine the cause of your disease and assess current levels of essential nutrients, hormones and important bio-markers of current and future disease.

What to Bring

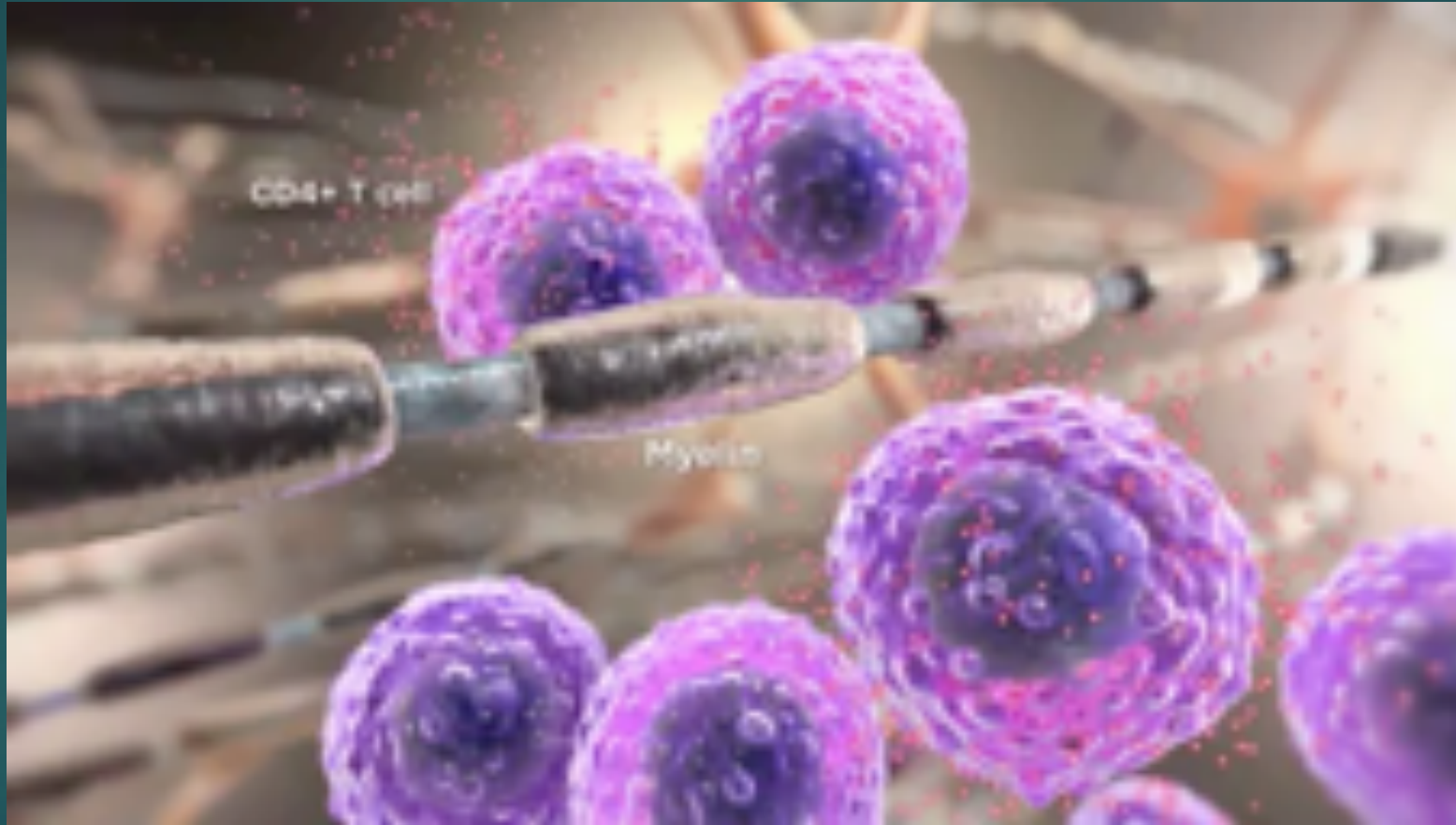
1. Completed New Patient Forms
2. Pertinent medical records, lab tests, etc. you have.
3. Current medications, dosage, and strength.
4. All current nutritional and herbal supplements.

NEW PATIENT FORMS

Anti-Aging Medicine

- ▶ Given the demographic evolution of the population in modern societies, one of the most important health care needs is **successful aging with less frailty and dependency**. During the last 20 years, a multitude of anti-aging, or age-reversing practices have appeared worldwide, aiming at slowing, stopping, or even reversing the effects of aging on the human body.

The Marvel of Nature



The Cause of Aging

“We don’t age because we are getting older!

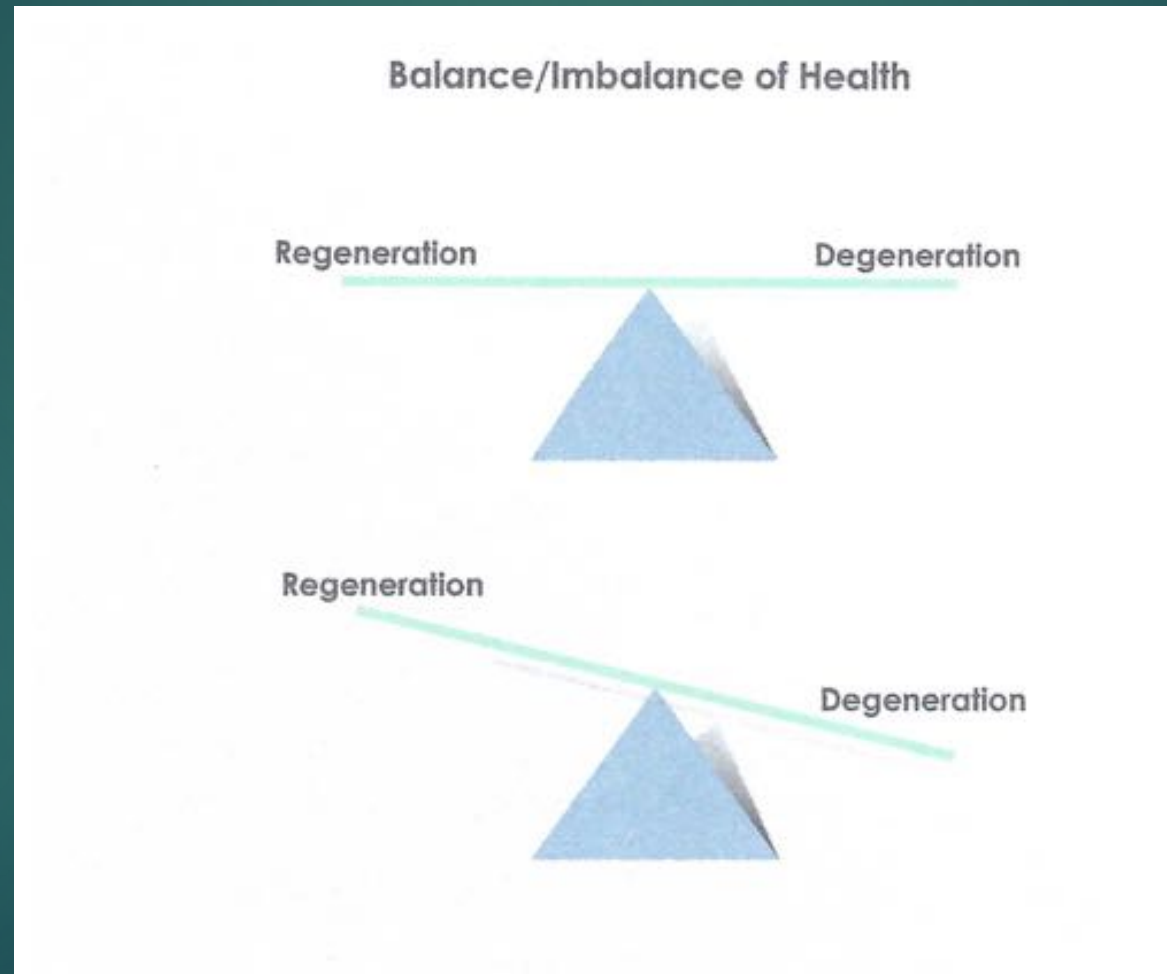
We age because our hormones, neurohormones, peptides, cytokines, exosomes, and stem cells are declining!

When this happens the body breaks down faster than it is capable of rebuilding.

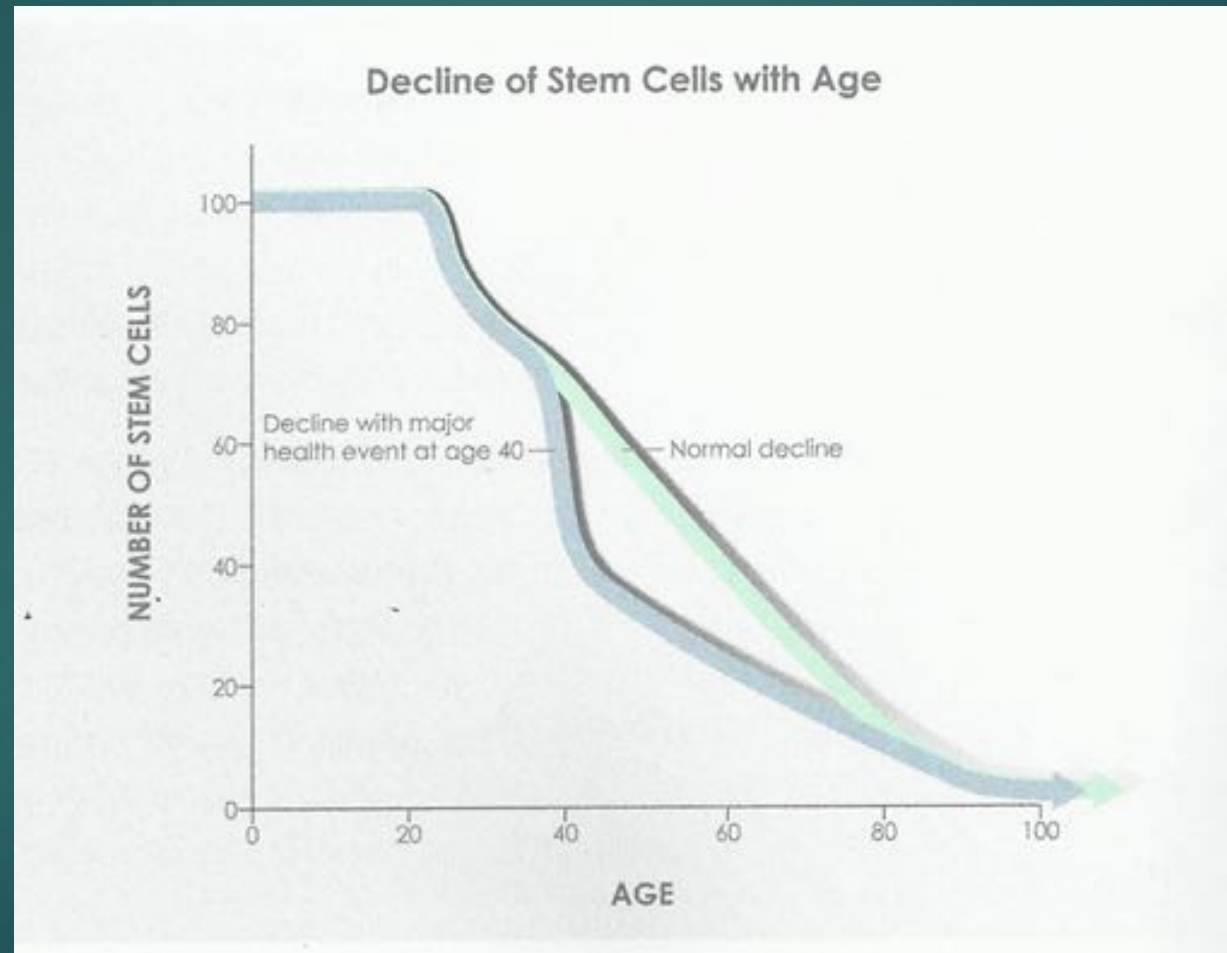
Frail or Fantastic at 100?



Regeneration vs Degeneration



Decline of Stem Cells with Age



We Start with Billions of Stem Cells!



Stem Cells in their Prime



By Age 35 Stem Cells are
25% Depleted



By Age 55 Stem Cells are already
50% Depleted



By Age 75 Stem Cells are
75% Depleted



The Solution

Detoxification and Supplementation

Detoxification

- ▶ Skin
- ▶ Lymphatics
- ▶ Liver
- ▶ Kidneys
- ▶ Diet
- ▶ Exercise
- ▶ Oral & IV Chelation Therapy

Supplementation

- ▶ Fresh Air: Exercised Enhanced by Aerobically Trained Respiration
- ▶ Purified, Mineralized, pH Balanced Water
- ▶ Optimum Physical & Neuro-regenerative Sleep
- ▶ Vitamins
- ▶ Minerals
- ▶ Hormones
- ▶ Cytokines
- ▶ Exosomes
- ▶ Stem Cells

Hormones

- ▶ Hormones are signaling molecules, produced by the endocrine and the circulatory system to target distant organs to regulate physiology and behavior.
- ▶ Skin aging as well as increased visceral fat and decreases in lean body mass, bone mineral density (BMD), sexual desire and erectile function, intellectual activity, and mood have all been related to a decrease in hormone production that occurs with age.

What Hormones Should You Test and Supplement?

1. Growth Hormone
2. Pregnenolone
3. DHEA
4. Testosterone
5. Estriol
6. Estradiol
7. Progesterone
8. Thyroid (both T3 and T4)

Growth Hormone

- ▶ Production of GH peaks during adolescence and falls after the age of 21 by about 14% per decade.
- ▶ By age 60 GH production is reduced by one-half.
- ▶ The average 20 yr old produces 500 micrograms per day
- ▶ 35 year olds produce only 200 micrograms per day
- ▶ 70 – 80 year olds produce as little as 25 mcg of GH per day
- ▶ Individuals with higher levels of GH appear more youthful and report greater vitality and stamina.

Growth Hormone



Growth Hormone Deficiency

- ▶ Decreased Collagen Production
- ▶ Wrinkling, Sagging and Thinning of Skin
- ▶ Stiffening of Joints
- ▶ Hardening of arteries
- ▶ Decreased muscle strength
- ▶ Decreased bone mass
- ▶ Increased body fat
- ▶ Increased Cholesterol levels
- ▶ Memory weakness
- ▶ Moodiness, depression or apathy
- ▶ May Prevent or Decrease β -amyloid accumulation

Pregnenolone

- ▶ The most highly concentrated steroid hormone in the human brain
- ▶ Nourishes & Protects the Brain and the Nervous System
- ▶ Improves Memory & Cognitive Function
- ▶ Attenuates GABA (the calming anti-anxiety Neurohormone)
- ▶ Enhances NMDA an excitatory /memory Neurohormone
- ▶ Increases Acetyl-Choline memory functions
- ▶ Decreased Mean serum total cholesterol from 264 to 188 mg/dL in 20 patients treated with Pregnenolone, DHEA, Estriol, Estradiol, Progesterone and Testosterone.

DHEA

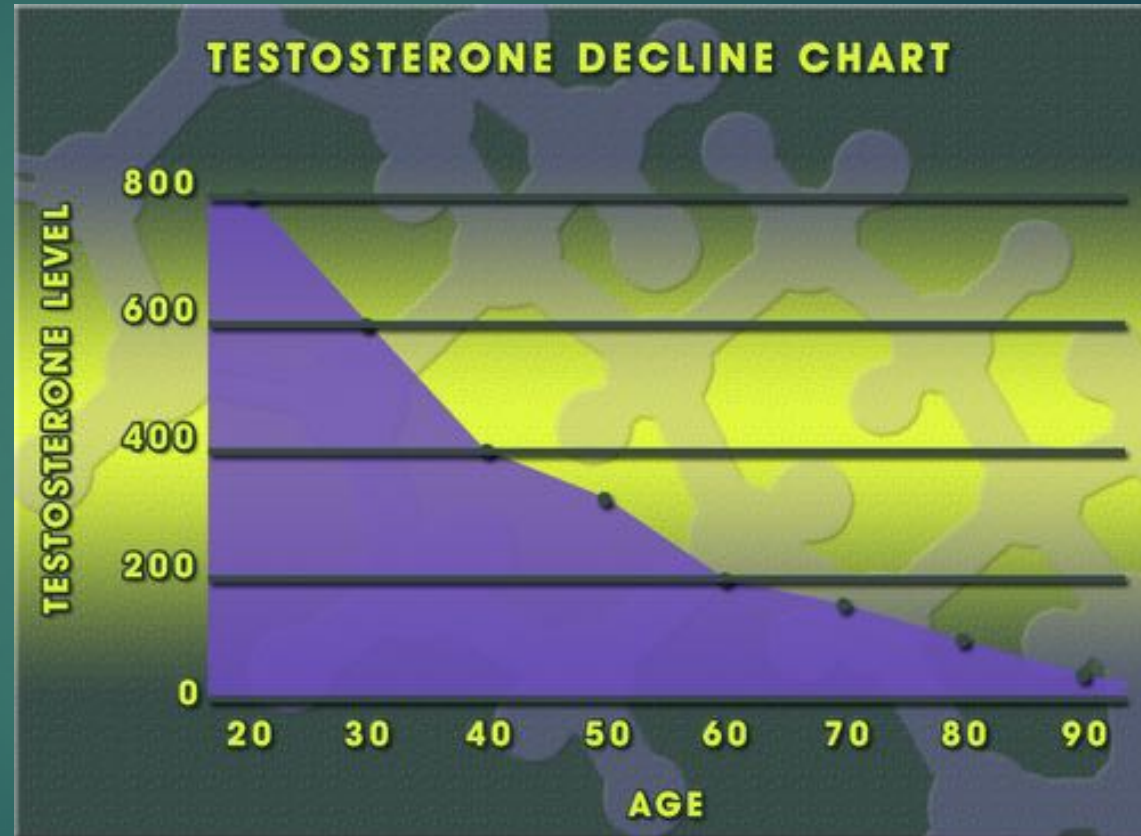
- ▶ Plasma DHEA levels decline with age. By the age of 70–80 years, levels may be as low as 10%–20% of those encountered in young individuals.
- ▶ DHEA may directly increase Nitric Oxide production from intact endothelial cells, probably through G protein-dependent activation of endothelial nitric oxide synthetase, thus supporting proper intrinsic physiological functions.

DHEA Functions

- ▶ Muscle Mass & Strength through Testosterone Production
- ▶ Mobility
- ▶ Bone Density
- ▶ Mood Elevation / Prevents Depression
- ▶ Libido & Sexual Sensitivity
- ▶ Erectile Function
- ▶ Immune System: DHEA inhibits tumors of lymphatic tissue, lung, colon, breast, liver, and skin

Testosterone (T)

Total T decreases with age at a rate of approximately 1% per year. This results in approximately 50% decrease by age 50 and a 80% decrease by age 70.



Testosterone (T) Deficiency

- ▶ Decreased Muscle Mass and Strength
- ▶ Increased Abdominal / Visceral Fat accumulation
- ▶ Depression
- ▶ Decreased Emotional Mood and Drive
- ▶ Decreased Sex Drive
- ▶ Increased Risk of Heart Disease, Diabetes and Dementia
- ▶ Involuntary urination

Estrone (E1) & Estradiol (E2)

- ▶ **Women's Health Initiative (WHI)** – In 2002, The Largest women's health prevention study ever, found that post-menopausal women taking a synthetic combination (estrogen and progestin) hormone therapy for menopause symptoms lead to an increased risk for **breast cancer, heart disease, stroke, blood clots, and urinary incontinence.**
- ▶ These are the 2 Estrogens that a woman needs to make a baby: they stimulate ER-alpha causing cellular proliferation of uterus and breasts.
- ▶ Excessive cellular proliferation of cells leads to increased cancer risk.

Estriol (E3)

- ▶ Stops Hot Flashes
- ▶ Increases Vaginal lubrication
- ▶ Decreases brain fog/mental dullness
- ▶ Prevents thinning of the skin, bones and vaginal membranes
- ▶ Decreases risk of Breast Cancer
- ▶ Stimulates Estrogen Receptor-Beta (ER-Beta), which decreases cellular proliferation (ie, cancer cells proliferation)
- ▶ Decreases urinary tract infections
- ▶ Protects the Nervous System – May reverse Multiple Sclerosis

Progesterone

- ▶ Stimulates Osteoblasts & Increases Bone Deposition (BMD)
- ▶ Calms the Nervous System
- ▶ Activates GABA Receptors & Increases Deep Sleep
- ▶ Counters excessive stimulation of Estrone and Estradiol
- ▶ Decreases Risk of Uterine and Breasts Cancer
- ▶ Unlike synthetic Progestins, Bio-Identical Progesterone does NOT increase the risk of blood clots or breast cancer
- ▶ Prevents Amyloid Beta and Alzheimer's Disease

Adrenal Cortisol

- ▶ Cortisol (also known as Hydrocortisone) is produced by the adrenal glands. It is released with adrenaline during times of stress. Cortisol raises blood sugar levels, promotes the metabolism of proteins and the breakdown of fats to provide strength and energy, makes your heart beat faster and increases your blood pressure. A deficiency will cause you to feel unable to cope with stress, wiped out and lightheaded, mentally dull and depressed, anxious, pessimistic and defeated, confused and distracted, or paralyzed by stress.

Adrenal Cortisol

Deficiency of Cortisol

- Unrefreshing sleep
- fatigued easily, feeling drained
- anxiety at the end of the day
- taking days to recover from stress
- irritable, angry, or easily upset
- low blood pressure
- lightheadedness or dizziness
- easily distracted or confused
- low blood sugar (hypoglycemia)
- Shaky & weak if miss a meal
- allergies, asthma

Excess of Cortisol

- Increased blood pressure
- rapid heart rate
- abdominal fat
- puffy or fatty face
- fat pad or hump on upper back/neck
- excess stomach acid, heartburn
- Osteoporosis
- loss of collagen from the skin
- thinning of the skin
- wrinkling of the skin

Thyroid (TSH, fT3, fT4)

- ▶ Hypothyroidism is an epidemic due to Endocrine Disrupting Chemicals of our day, including Pesticides, Plastics, PETE, Therephthalates, Non-Stick Cookware, etc.
- ▶ The types and severity of symptoms of hypothyroidism vary between individuals. At the onset of the disease, the symptoms can be vague and develop slowly. They may include weakness, weight gain, cold sensitivity, cold hands and feet, fatigue, dry skin, brittle nails, and thinning, brittle hair. Other early symptoms include muscle achiness, joint pain, and heavy menstrual periods.
- ▶ If undiagnosed and untreated, later symptoms can include confusion, thick skin, swelling of the arms or legs, slowing of speech, and depression.

Patient Stories: Bart & Paige



<https://drhansen.com/2016/02/08/hormones-restore-the-romance-make-you-feel-and-look-better-and-live-longer/>

Paige's Symptoms: Age 52

PATIENT: PAIGE, AGE 52	
<u>Symptoms Before Hysterectomy</u>	<u>Hormone Deficiency</u>
Endometriosis	High Estradiol, Low Progesterone
Infertility	High Estradiol, Low Progesterone
Uterine Fibroids	High Estradiol, Low Progesterone
Ovarian Cysts	High Estradiol, Low Progesterone
Heavy Menses	High Estradiol, Low Progesterone
<u>Symptoms After Hysterectomy</u>	<u>Hormone Deficiency</u>
Hot Flashes & Night Sweats	Low Estriol, Testosterone
Vaginal Dryness	Low Estriol, Testosterone
Painful Intercourse	Low Estriol, Testosterone
Migraines	Low Progesterone (Rx Premarin)
Low Sex Drive	Low Testosterone
Depression	Low Testosterone
Weight Gain in Abdomen	Low GH, Testosterone, DHEA
Joint Pains	Low GH, Testosterone
Sagging & Wrinkling of the Skin	Low GH, Estrogen

Paige's Labs

Paige's Lab Tests

Lab Tests	Optimal Range	Initial Labs	3 Month Check-Up	9 Month Check -Up
Estradiol (Bad)	1-4 ng/dl	9H	1.8	0.62L
Estriol (Good)	20-80 ng/dl	16L	38	32
Progesterone	100-400 ng/dl	<3L	150	200
DHEA	200-280 ng/dl	28L	91L	216
Testosterone	35-75 ng/dl	9.2L	20L	62
Pregnenolone	100-200 ng/dl	10L	80L	100
IGF-1(GH)	195-240 ng/ml	70L	170L	200

Paige 9 Months Later: Yrs Younger

- ▶ SUMMARY of RESULTS of Paige's Bio-Identical Hormone Therapy
- ▶ "Everything's better"
- ▶ No more night sweats – gone within first week
- ▶ Sleeping better, no longer waking in the night
- ▶ Calmer
- ▶ Happier; less apathy, more interest, motivation
- ▶ Less stiffness in the morning
- ▶ Skin is softer
- ▶ Sex drive is higher "Oh yes!" More desire and sensitivity
- ▶ No more vaginal dryness or pain during intercourse
- ▶ Lost 4 lbs in 4 weeks; 12 lbs in 13 weeks
- ▶ Feeling "fantastic!" "I feel like a different person"
- ▶ Now her husband is convinced – he wants to feel that good

Bart's Symptoms: Age 58



PATIENT: BART, AGE 58

<u>Initial Symptoms</u>	<u>Hormone Deficiency</u>
Low Back Pain	Low Testosterone, Low GH(IGF-1)
Low Energy, Slowing Down	Low Testosterone
Decreased Stamina	Low Testosterone
Elevated Cholesterol	Low Testosterone
Low Sex Drive	Low Testosterone
Erectile Dysfunction	Low Testosterone
Weight Gain	Low Testosterone, Low GH(IGF-1)

Bart's Labs

Bart's Lab Tests

Lab Tests	Reference Range	Optimal Range	Initial Labs	3 Month Check-Up
DHEA	200-640 ng/dl	400-500 ng/dl	180L	438
Testosterone	348-1197ng/dl	800-1200 ng/dl	290L	905
Estradiol(Bad)	1-4 ng/dl	1-4 ng/dl	1.6	3.6
Progesterone	40-140 ng/dl	80-140 ng/dl	30L	90
IGF-1 (GH marker)	70-395 ng/dl	220-300 ng/dl	170L	230

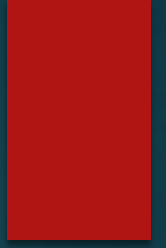
Bart's Words: "20 Years Younger"

- ▶ When I asked Bart how he felt after his 3 month check up, he said, "Why did I wait so long. I just thought it was just the way it was; I was getting older and I just had to expect less of myself, but it made me feel less too. Then, after being on Dr. Hansen's program for one month, I was convinced that I had been wrong. You don't have to feel that way. I feel like I'm 20 years younger now. My energy and mood are up again, I feel strong and have endurance and stamina again like I did 20 years ago. "

Bart's Words: "20 Years Younger"

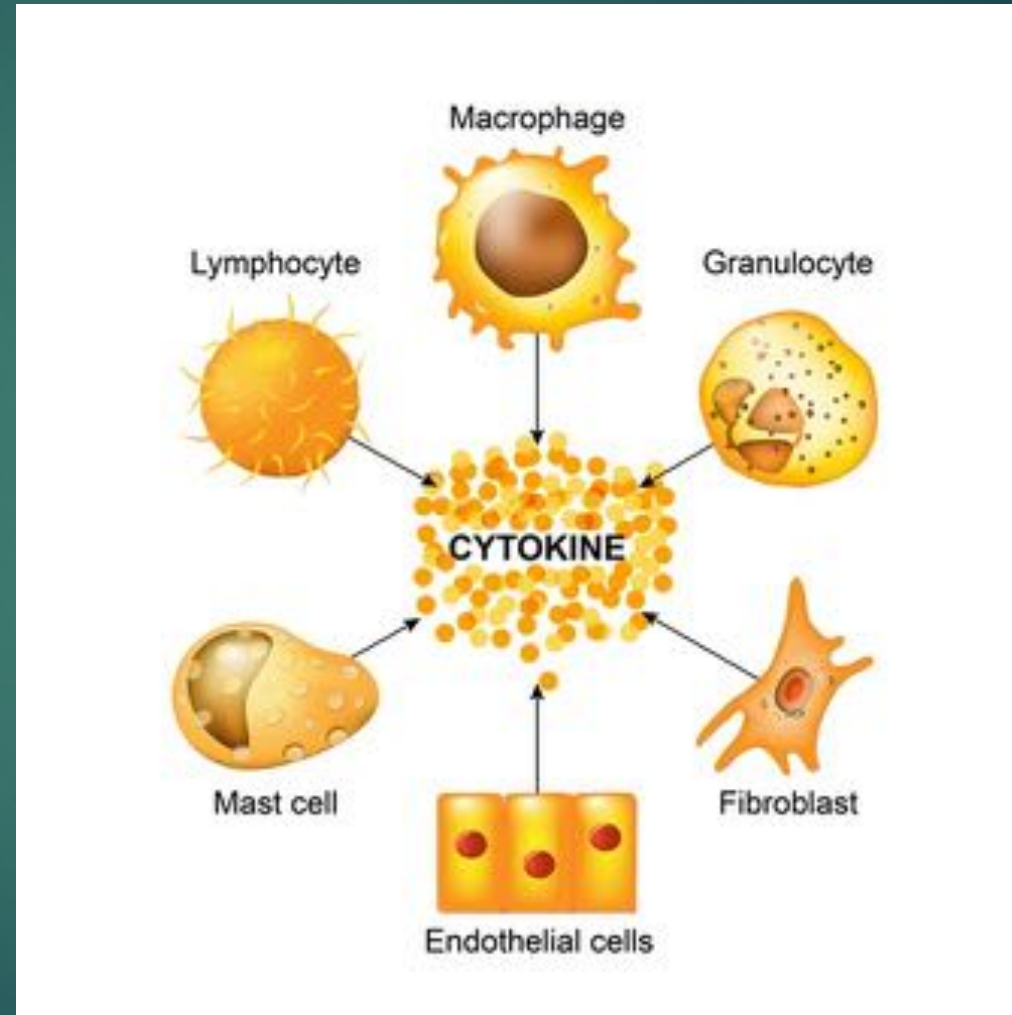
- ▶ "Best of all I have my zest for life is back again. My wife and I are more in love now than ever. This just feels good. And perhaps the best news of all is that the Bio-identical Hormones reduce my risk of heart disease, prostate cancer and Alzheimer's. I asked Dr. Hansen how long can I stay on this program and he said, 'As long as you want to keep feeling this good.' I'm certainly convinced this is the best anti-aging program there is. I've seen it work miracles for me and my wife. I never want to go back to the old me. I want to keep this up forever."

Additional Anti-Aging Therapies



Cytokines

Cytokines are small secreted proteins released by various cells of the immune system that have a specific effect on the interactions and communications between cells



Cytokines

- ▶ Cytokines are involved in immune regulation, inflammation, pain management and apoptosis, or programmed cell death.
- ▶ Cytokines include chemokines, interferons, interleukins, lymphokines and tumor necrosis factors.

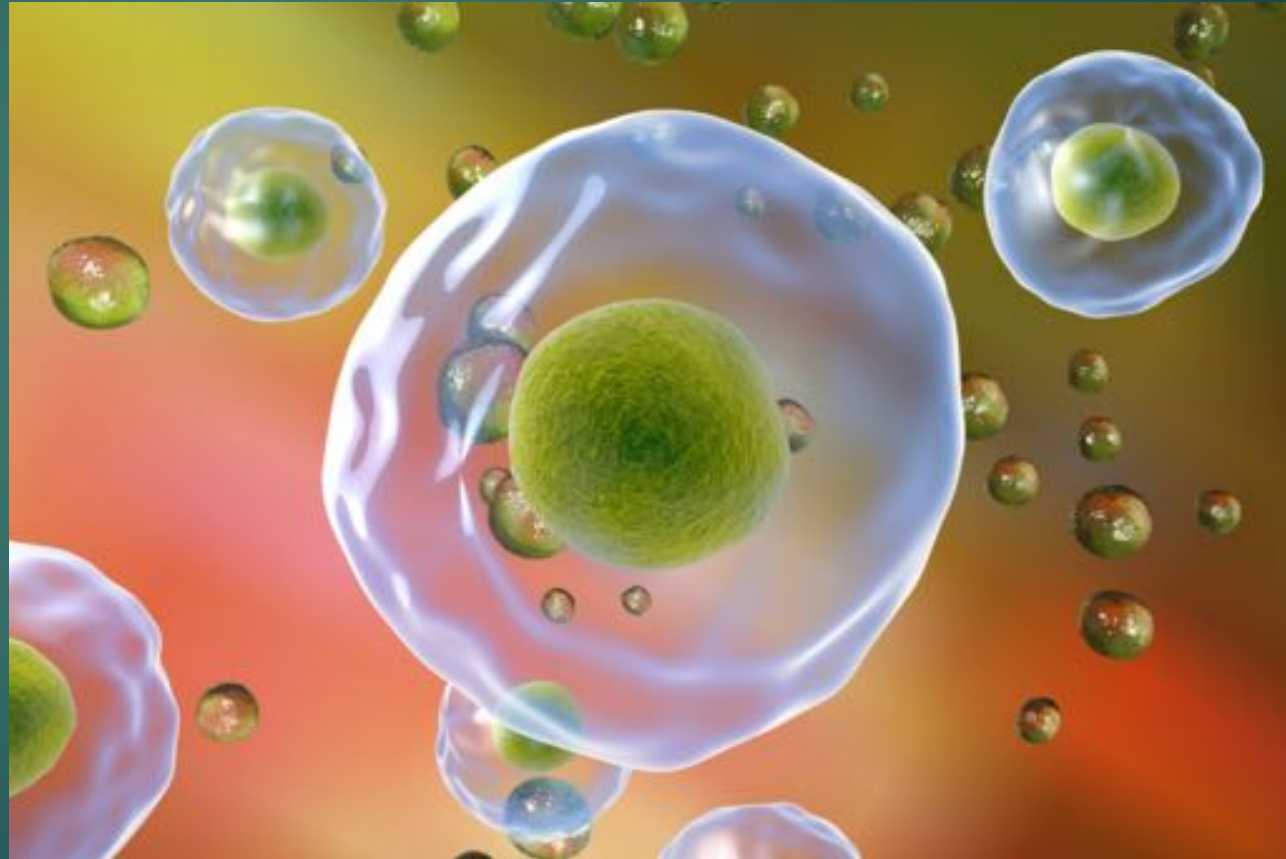
Exosomes



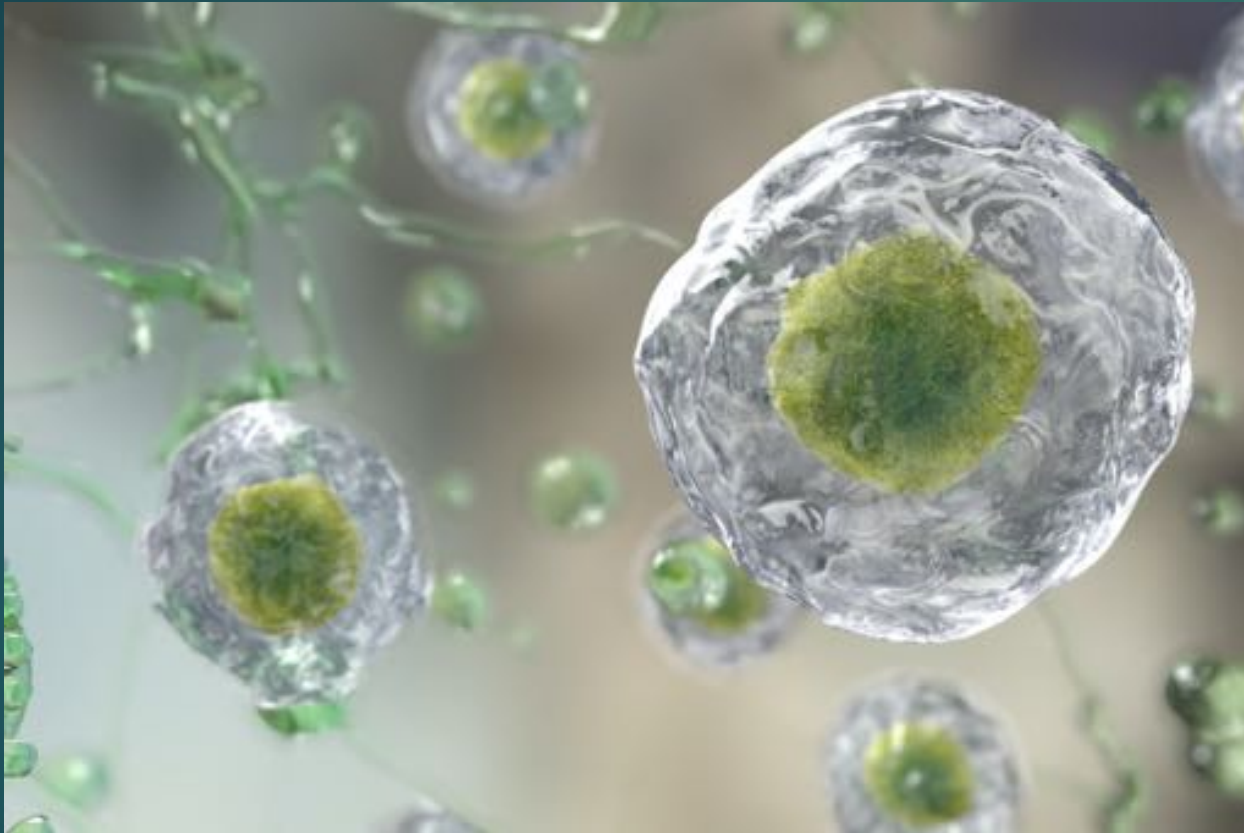
Exosomes are distinct cellular packages of information produced by mesenchymal stem cells (MSCs), including messenger RNA, micro RNA, growth factors, proteins, cytokines and lipids.

Exosomes

Exosomes create their effects by transferring their medicinal contents to adjacent cells, targeting cell function by delivering proteins, lipids, and nucleic acids, Cytokines, and Growth Factors, such as Fibroblast Growth Factor that makes Collagen and Vascular Endothelial Growth Factor that stimulates growth of new blood vessels.



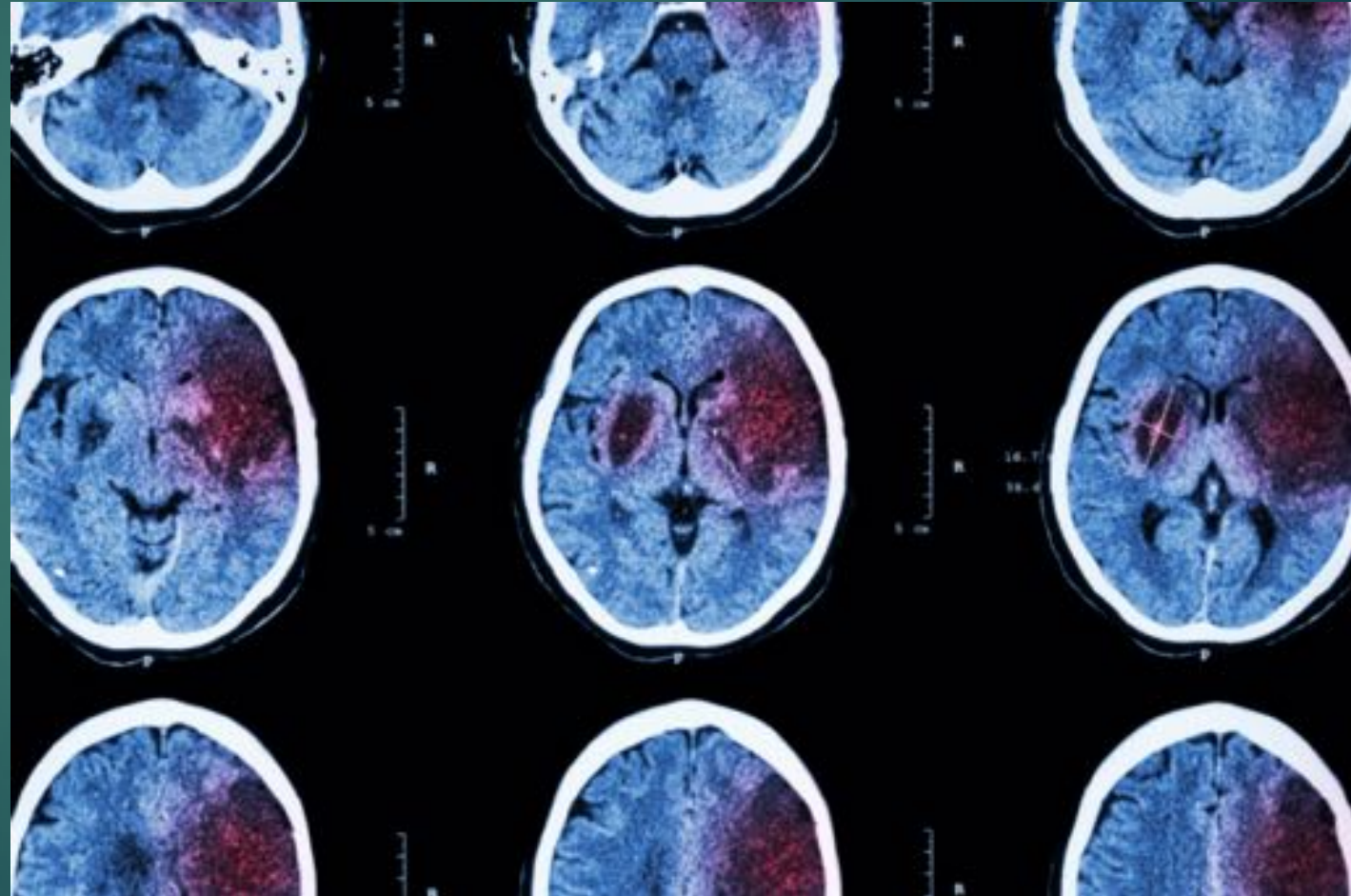
Exosomes



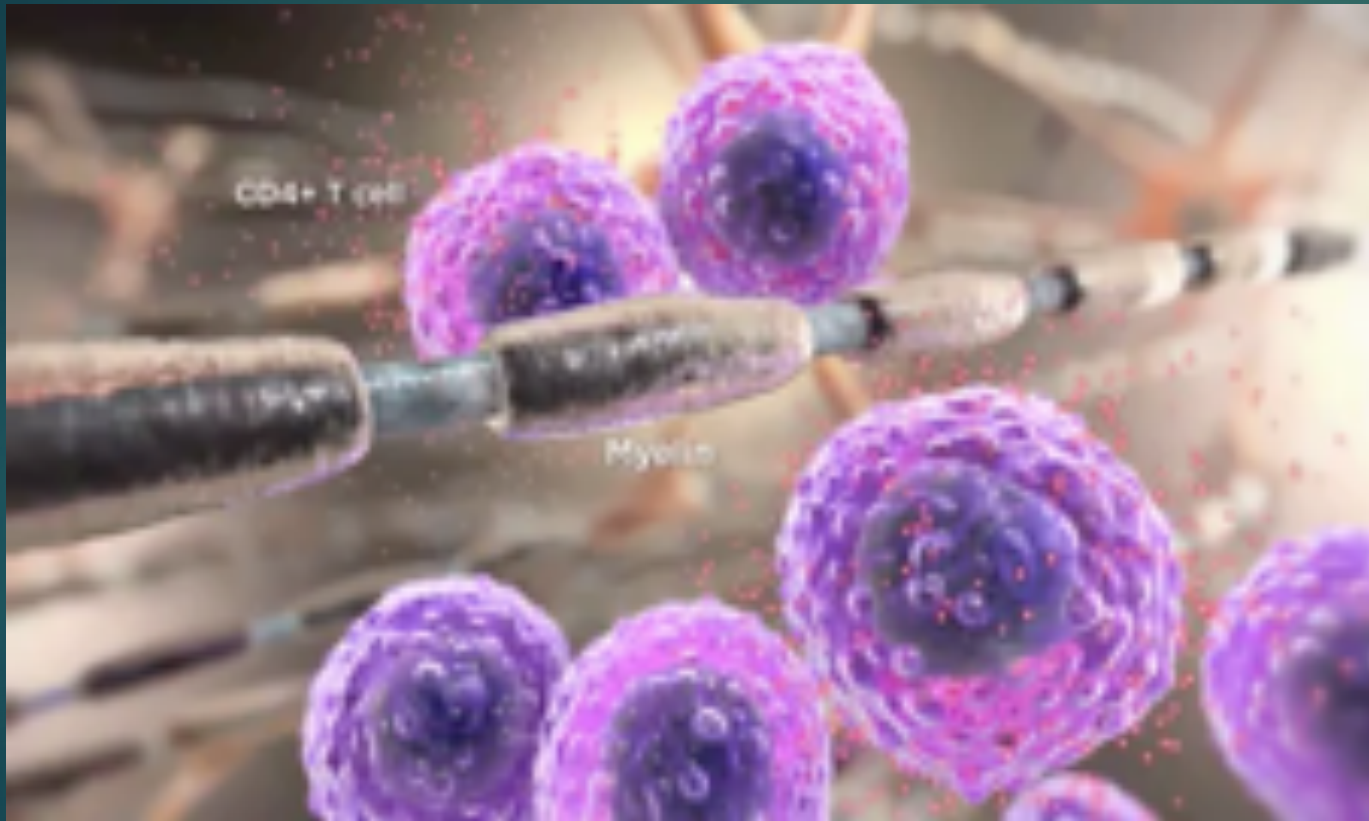
Exosomes are known to promote tissue healing and growth, reduce inflammation and balance the immune system, including reversing or turning off Auto-Immune Diseases, like Lupus, MS, Diabetes, and Rheumatoid Arthritis.

Exosomes Effective after Stroke

Exosomes harvested from multipotent Mesenchymal Stem Cells (MSCs) mediate the restorative & therapeutic effects of MSCs for Stroke.



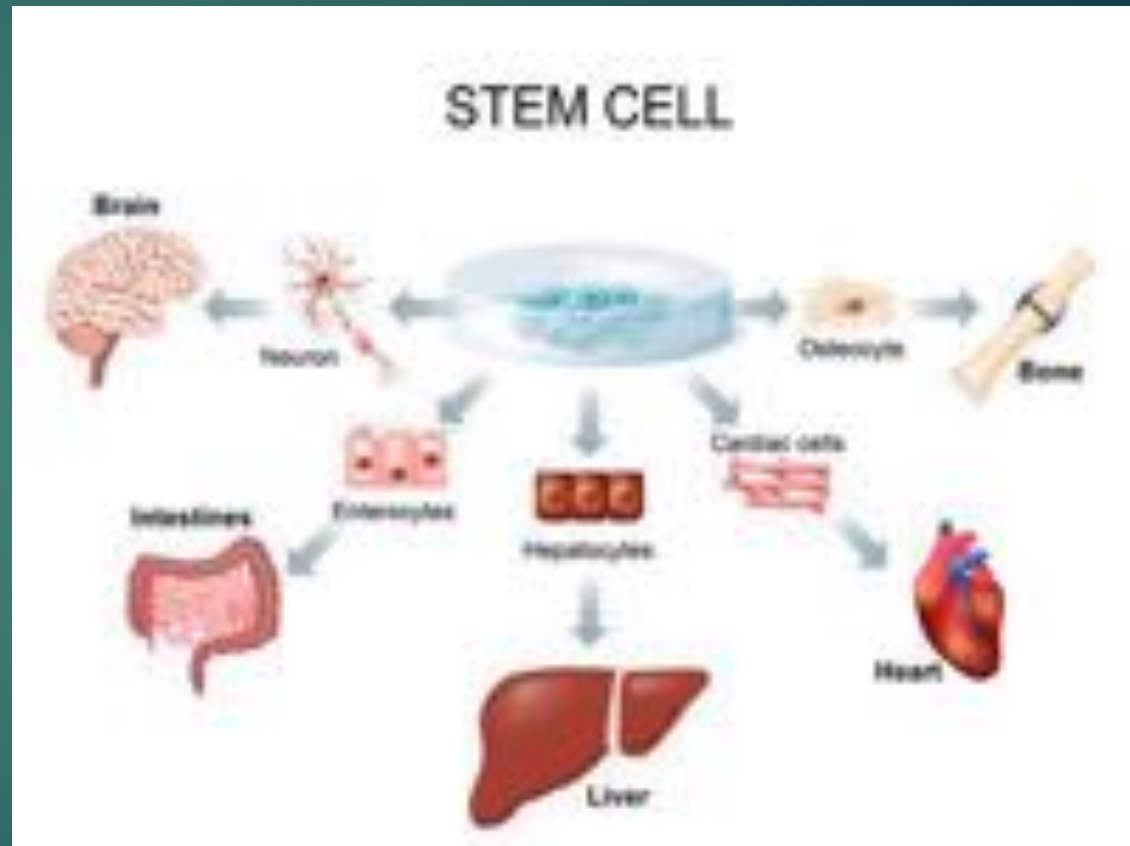
Stem Cells



Stem cells are naturally occurring multipotent cells that are made by the body in cells known as “Pericytes” that reside on or around the surface of the body’s blood vessels. Recent research has found that almost all types of body tissues and organs contain **adult stem cells** that the body keeps on hand in order to supplement, repair or replace damaged tissue.

Stem Cells

Adult Stem Cells are able to differentiate into almost any specific cell type needed and offer the possibility of a renewable source of replacement cells and tissues to treat diseases including macular degeneration, spinal cord injury, strokes, burns, heart disease, diabetes, osteoarthritis, rheumatoid arthritis and other autoimmune diseases.



Stem Cell - Sources

- ▶ Stem Cells are derived from three different sources: umbilical cord tissue, bone marrow, and adipose (fat) tissue. Bone marrow and adipose tissue stem cells have been used much longer, but can only be retrieved through invasive surgical procedures. Umbilical cord stem cells do not require surgery and have been shown to provide the richest and most robust source of active Mesenchymal Stem Cells.



Stem Cell Therapy



When an area of the body is injured or not functioning properly, distress signals are sent through the bloodstream. These signals serve to recruit mesenchymal stem cells to come to the affected area. Once in the affected area, stem cells dock on other cells and begin to produce Exosomes, Cytokines and Growth Factors that work to regulate inflammation, aid in new blood vessel production known as angiogenesis, and promote healthy tissue repair.

Stem Cells

12/19/2016 Press Announcement - Released from FDA Commissioner Scott Gottlieb, M.D. on the FDA's new policy steps and enforcement efforts to ensure pt...

FDA Statement

Statement from FDA Commissioner Scott Gottlieb, M.D. on the FDA's new policy steps and enforcement efforts to ensure proper oversight of stem cell therapies and regenerative medicine

For Immediate Release
August 28, 2017

Statement

One of the most promising new fields of science and medicine is the area of cell therapies and their use in regenerative medicine. These new technologies, most of which are in early stages of development, hold significant promise for transformative and potentially curative treatments for some of humanity's most troubling and intractable maladies. Recent advances in our basic knowledge of the pathways involved in tissue damage and regeneration have combined with remarkable progress in adult stem cell biology to put us at a genuine inflection point in the history of medicine. The prospect of clinical tissue repair strategies is a tangible reality. This promise is reinforced by the strong commitment of the investment and scientific communities in exploring the potential applications across a wide range of vexing diseases and conditions, such as cancer, Parkinson's disease, and diabetes, among many others.

However, with all of the medical potential, also comes novelty and uncertainty as this field matures. There are a small number of unscrupulous actors who have seized on the clinical promise of regenerative medicine, while exploiting the uncertainty, in order to make deceptive, and sometimes corrupt, assurances to patients based on unproven and, in some cases, dangerously dubious products. These dishonest actors exploit the sincere reports of the significant clinical potential of properly developed products as a way of deceiving patients and preying on the optimism of patients facing bad illnesses. This puts the entire field at risk. Products that are reliably and carefully developed will be harder to advance if bad actors are able to make hollow claims and market unsafe science. In such an environment a select few, often motivated by greed without regard to responsible patient care, are able to promote unproven, clearly illegal, and often expensive treatments that offer little hope, and, even worse, may pose significant risks to the health and safety of vulnerable patients. These so-called treatments run afoul of the FDA's legal and regulatory framework governing this new field.

<https://www.fda.gov/oc/2017/08/28/Statement-From-Commissioner-Gottlieb-2017-08-28>

1/8

The Commissioner of the FDA, Scott Gottlieb, MD, has said,

"One of the most promising new fields of science and medicine is the area of cell therapies and their use in regenerative medicine.

Stem Cell Therapy

Scott Gottlieb, MD, FDA Commissioner, Aug 27, 2017

These new technologies, most of which are in early stages of development, hold significant promise for transformative and potentially curative treatments for some of humanity's most troubling and intractable maladies. The applications of stem cells in regenerative medicine are as diverse as stem cells' ability for differentiation. While this healthcare technology has made the most headway in orthopedics as an alternative to invasive joint surgeries and in healing non-union bone fractures, it is also breaking ground in the rheumatology, cardiology, neurology, immunology and other areas as well."

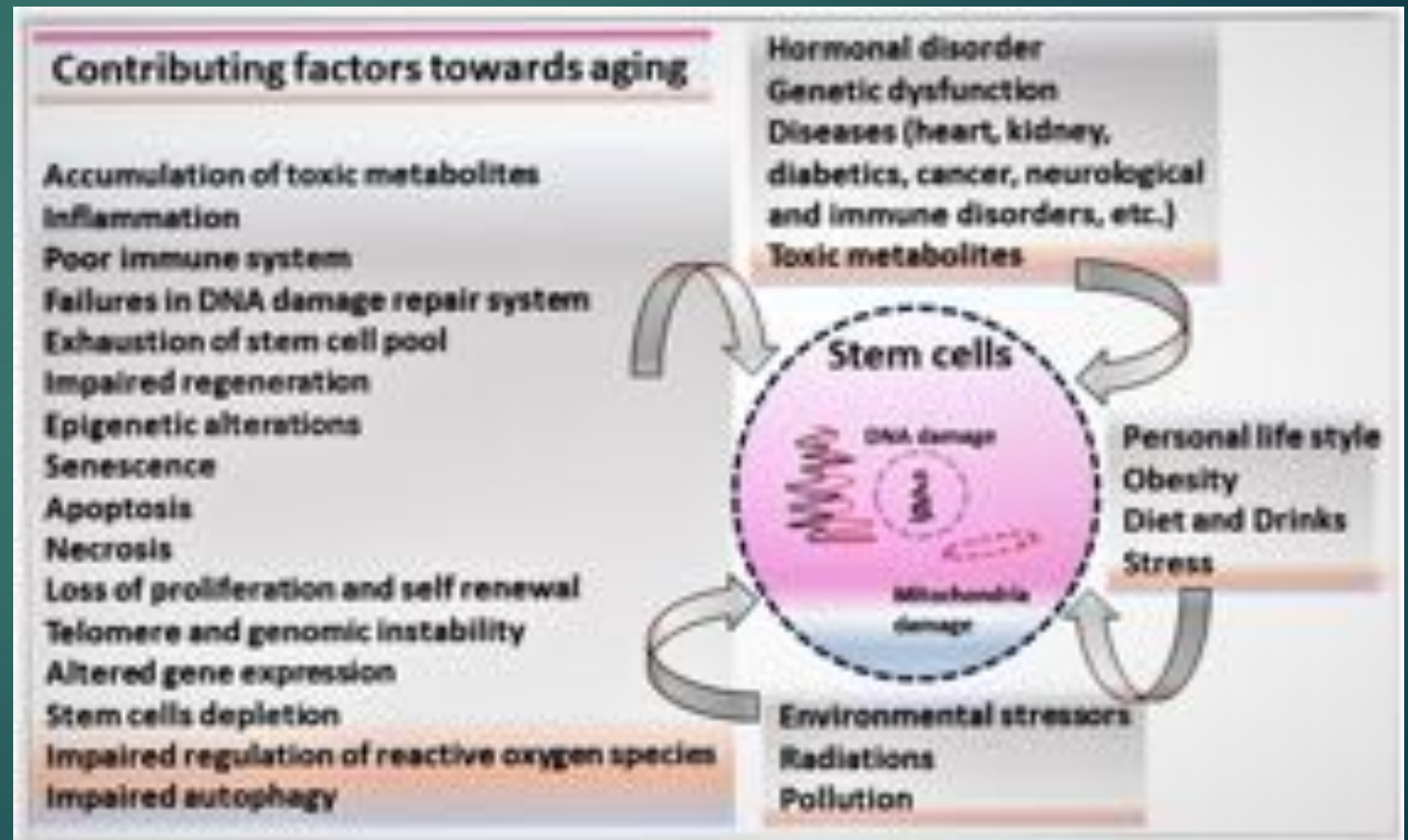
Conditions Benefited by Stem Cell Therapy

- ▶ Osteoarthritis
- ▶ Rheumatoid Arthritis
- ▶ Auto Immune Disease
- ▶ Lupus
- ▶ Crohn's Disease
- ▶ Ulcerative Colitis
- ▶ Multiple Sclerosis (MS)
- ▶ Psoriasis
- ▶ Scleroderma
- ▶ ALS
- ▶ Fibromyalgia
- ▶ Degenerative Disc Disease
- ▶ Bulging/Protruding Discs
- ▶ Lyme Disease
- ▶ Heart Disease
- ▶ Strokes
- ▶ Lung Disease/COPD
- ▶ Type II Diabetes
- ▶ Parkinson's Disease
- ▶ Alzheimer's Disease
- ▶ Neuropathy
- ▶ Spinal Cord Injury
- ▶ Erectile Dysfunction
- ▶ Autism

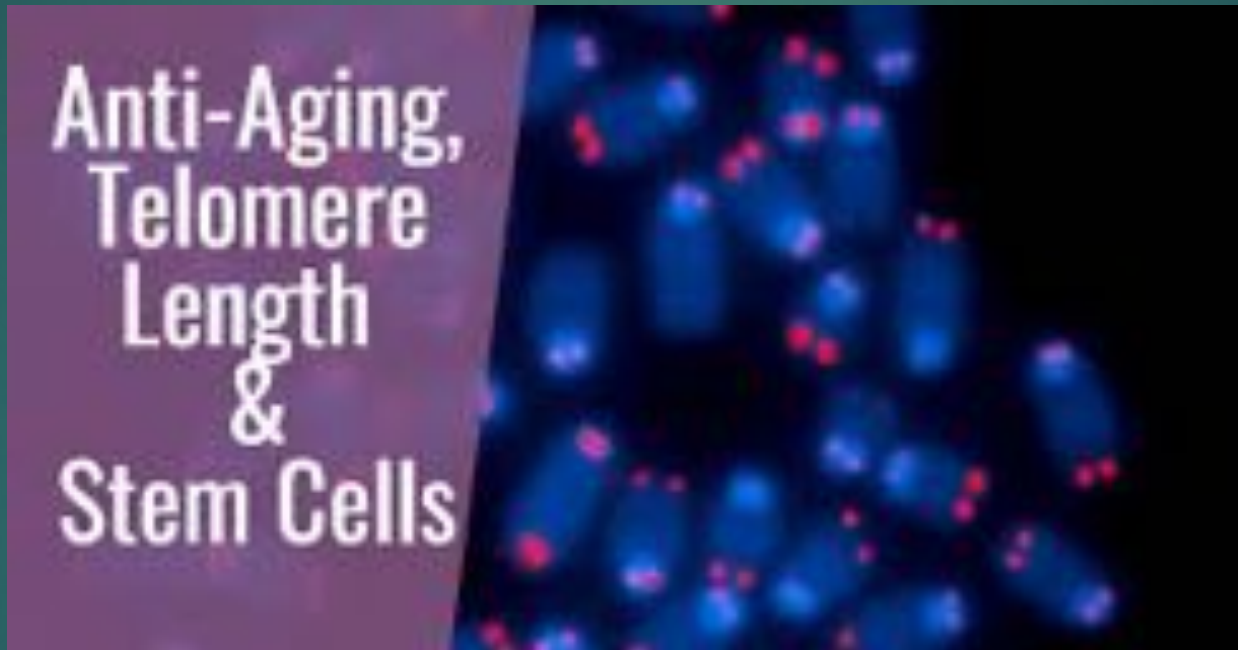
Stem Cell Therapy & Aging

Stem cells & anti-aging genes play a crucial role in delaying the aging process.

Stem cells in conjunction with anti-aging genes probably receive and neutralize most of the devastating signaling effects which are known to cause premature aging.

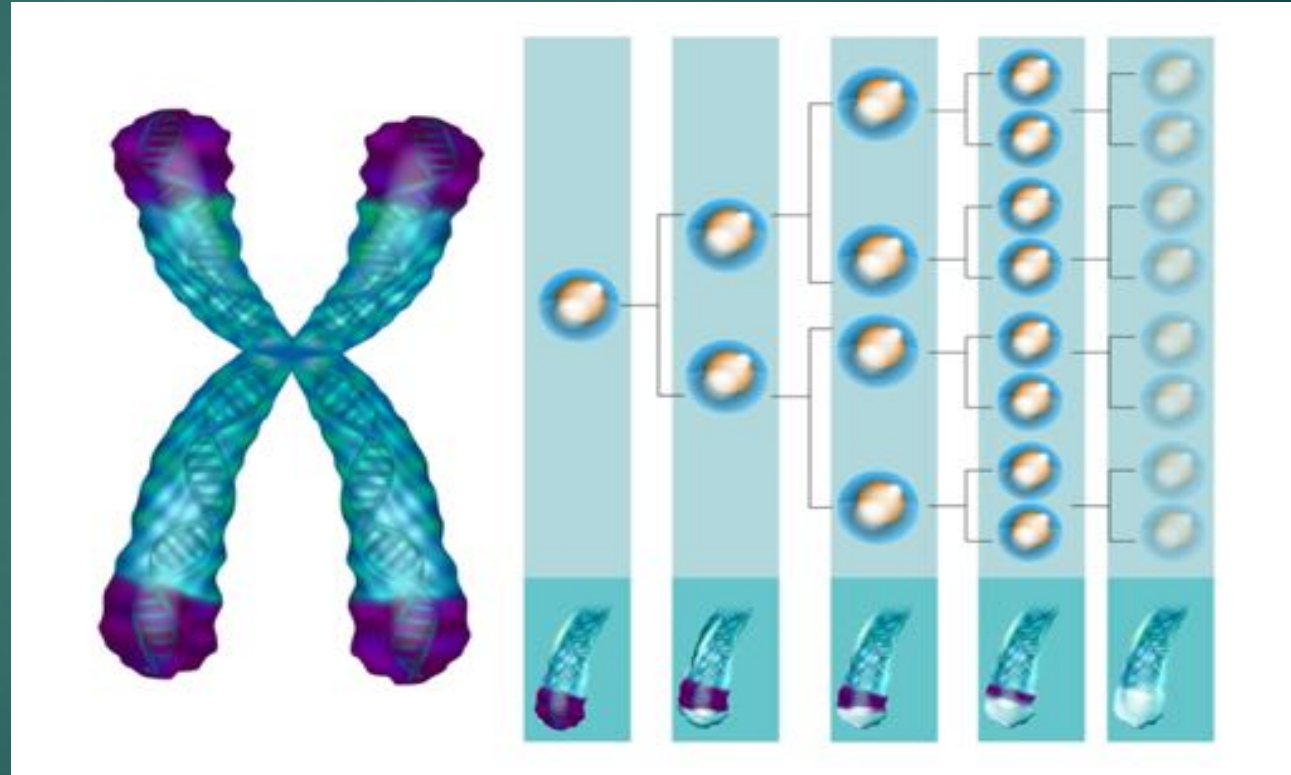


Stem Cells and Telomeres

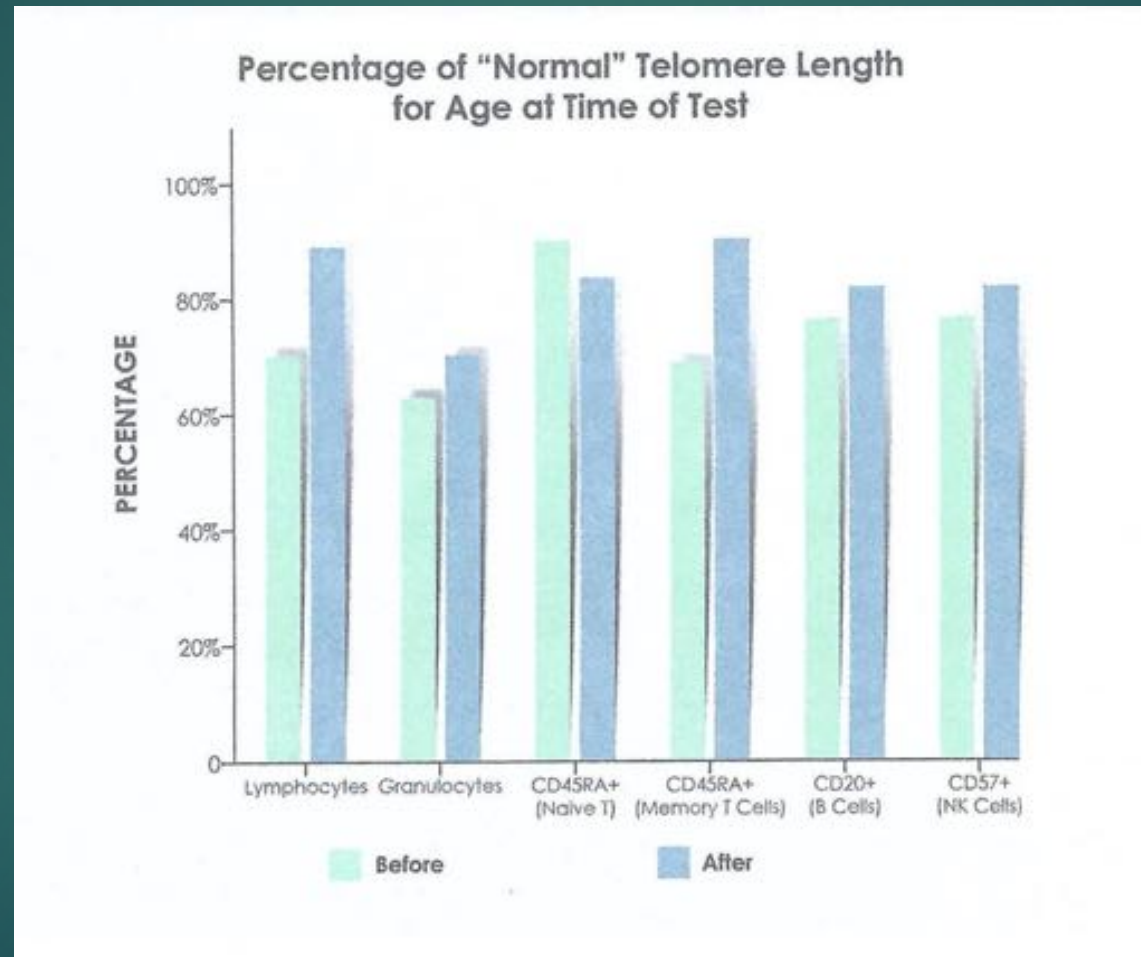


Stem Cells Lengthen Telomeres

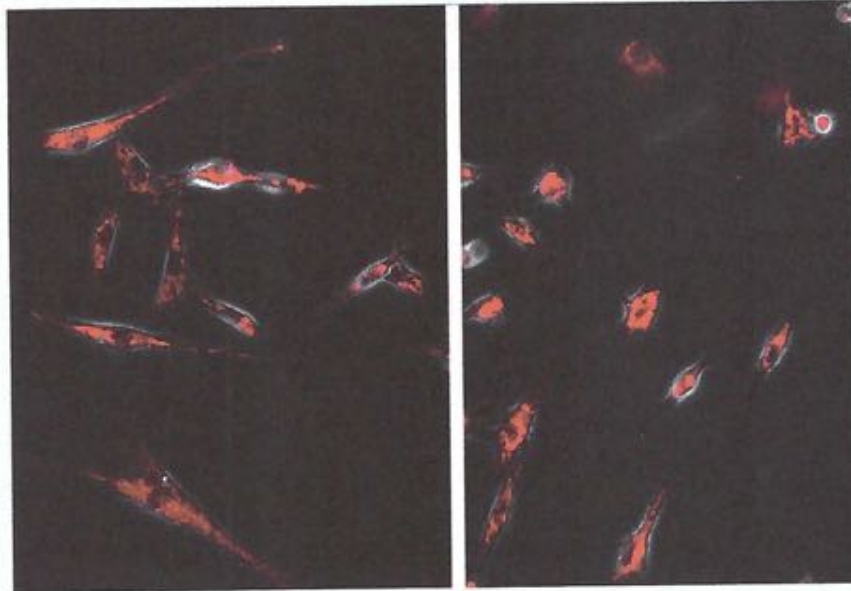
Human Umbilical Cord Tissue (HUCT) Mesenchymal Stem Cells (MSCs) have proven to successfully lengthen 5 out of 6 Telomeres after 3 IV Infusions given over a period of one year to a 79-year-old man with pulmonary fibrosis



Stem Cells Lengthen Telomeres



Stem Cells and Mitochondria



The MSCs in the images above were cultured from the bone marrow of a 65-year-old. The cells on the left were treated with secretions of amnion, a tissue rich in MSCs derived from the amniotic sac of healthy newborns; the cells on the right were cultured with a standard growth medium. Notice the red mitochondria in the cells on the left are evenly distributed throughout the cell body, indicating healthy cells. On the right, the mitochondria are limited mostly to the area surrounding the nucleus, and the morphology of the cells is flattened and more fibroblastic, indicating the cells are near exhaustion, or terminal differentiation. If we measure the trophic factors from the cells on the right, the number and concentration will be much lower than from the cells on the left. This phenomenon highlights the ability of MSCs derived from younger tissue to retrain the MSCs from an older individual to behave like younger MSCs.

Stem Cells: Mitochondrial Factories

Frailty of Aging—Reversing the Inevitable

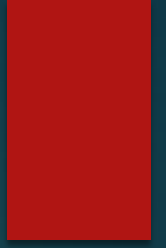
Very interesting research in the past few years has discovered that MSCs are the only cells we know of that donate their mitochondria.^{20,21} MSCs actually triage cells, just like in the hospital when a nurse triages patients to determine who needs immediate treatment and who can wait a while. When an MSC encounters another cell, if it detects a need for help, it will actually donate its mitochondria via small vesicles (containers) or tubules (tubes), to the cell in an effort to replace the oxidized mitochondria with healthy mitochondria.

This scientific discovery deserves a Nobel Prize in my opinion. In the future, I believe we will be able to bioreact MSCs, optimizing them to produce these microvesicles and microtubules of mitochondria that will perhaps allow people to live a healthy life span of 200 years. MSCs as mitochondrial factories may one day be one of the most important science breakthroughs of our time.

The Promise of Regenerative Medicine

*“This is no longer the stuff of science fiction.
We’re at the beginning of a paradigm change in medicine
with the promise of being able to facilitate regeneration of
parts of the human body,*

Thanks for Listening



Stem Cell Costs



Stem Cell Costs



Exosomes Costs



The cost of Exosomes is much less than the cost of Stem Cells due to the fact that Stem Cells are very difficult to harvest and process since they are living cells and only work if preserved properly and kept frozen at -80 to -120 degrees Centigrade.

400 Million Exosomes for IV Anti-Aging Infusion cost \$2900 per infusion.