Managing the Aging Process

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Dr. Cwynar is on faculty at Cedars-Sinai Medical Center, serves as an Assistant Clinical Professor of Medicine at UCLA, and is world-renowned for her expertise in bio-identical hormone replacement, menopause, male menopause, thyroid function, weight loss and overcoming fatigue. She is a member of The Endocrine Society, and has received numerous honors and awards, including California’s Doctor of the Year and Top Thyroid Doctor of Beverly Hills. She is also the author of *The Fatigue Solution*. 
Managing the Aging Process

Two Issues: *Quantity* of Life and *Quality* of Life

Now there are diagnostic tools available to measure **biological aging**.
Meet My Patient – “Joe”

- 51 year old male
- Triathlete
- Stressful job (Litigation Attorney)
- Generally follows good diet
- Slim (good BMI)
- Executive physical results
  - Cholesterol 210, Triglycerides <100
  - CBC, chemistry, EKG = all normal
  - Told he is healthy, return in one year...
“Joe’s” Telomere Score

Patient Telomere Score = 5.19
Percentile = 7%
What is a Telomere?

Telomeres appear to protect the chromosomes from damage.
The Science Behind It’s Importance

Chromosomes without telomeres were unprotected and damaged.

Chromosomes with telomere DNA were protected and remained intact.
What are Telomeres?

Telomeres
- Repetitive DNA sequences
- Found at the ends of all human chromosomes

Protective role of telomeres
- Separate chromosomes
- Keep DNA from “fraying” or “entangling”
- Without telomeres, chromosomes would fuse causing major genomic instability (leading to apoptosis or cancer)

In every human cell
- 23 pairs of chromosomes = 46 chromosomes total
- We have 92 telomeres (one on each chromosome end)
Telomere Research

2009 Nobel Prize in Physiology or Medicine awarded for the discovery of “how chromosomes are protected by telomeres and they enzyme telomerase”
Telomeres & Aging

How telomeres are linked to aging

– Every time a cell divides, telomere length decreases
– If telomeres reach a certain length, cell can no longer divide
– Cell metabolism slows, cell ages, then dies
– Telomeres are a “molecular clock”

Exceptions (cells that produce telomerase)

– Stem cells
– Germ cells
– Cancer cells
Telomeres & Aging

Clinical findings linked to shortened telomeres

- Oxidized LDL
- Smoking
- Obesity
- Nutrient deficiencies
- Sleep deprivation, poor quality sleep
- Lack of estrogen
- Lack of testosterone
- Lack of human growth hormone
- Increased homocysteine
- Diabetes/insulin resistance
- Oxidative stress
Telomeres & Aging

Clinical findings linked to telomere preservation

- Exercise (exception – some endurance athletes)
- Bioidentical hormone replacement
- Sleep
- Diet rich in unprocessed food
- Good antioxidant status
- Some supplements (resveratrol, correcting deficiencies)
- Caloric restriction
Telomeres

Caloric restriction preserves telomeres

- Most oxidative stress is from normal metabolic processes (digestion, cellular repair)
- Caloric restriction studies
  - Rodents increased lifespan by 35% on restricted diet
  - True of other species as well (monkey, human, etc)
Telomeres & Vascular Aging

Leukocyte DNA predicts vascular aging

- In humans with and without vascular disease, blood leukocyte telomeres predicts vascular telomere length
  - Telomeres from biopsies on aneurysm aorta vs normal aorta were shorter (Eur Heart Journal, 2008)
  - Difference remained after adjusting for age and gender
- Shortened telomeres an independent risk factor for CVD (Front Biosci, 2008)
Telomeres & Disease

Shorter telomeres linked to more than just heart disease...

- Cancer
- Obesity
- Type 2 Diabetes
- Osteoarthritis
- Periodontitis
- Dementia
- Neurological diseases (Parkinson’s)
- Cataract
- Depression
- Infertility
Aging

Modifiable Risk Factors

- Strengthen immune function
- Optimize methylation metabolism
- Limit inflammatory processes
- Improve mitochondrial function
- Reduce (manage) chronic stress
- Regulation of glycemic control & insulin function
- Correct nutritional deficiencies
Telomere Testing Results

Good telomere score, good lifestyle
  – Affirmation that what they are doing is working

Poor telomere score, bad lifestyle
  – Impetus to make serious changes
  – Evidence of internal aging before external disease

Poor telomere score, good lifestyle
  – Take a closer look at lifestyle
    – Quality of food they eat, excessive exercise, stress…
  – Look further into diagnostics
    – Subclinical nutritional deficiencies
    – Antioxidant & inflammatory status
    – Food sensitivities
    – Consider hormone replacement therapy
What do I do with the Results?

Look further at available diagnostic tools

- Food allergy (sensitivity) testing
  - Allergy testing is skin prick testing for anaphylaxis (IgE)
  - Sensitivity testing looks at delayed antibody reactions to food (IgG or IgA)
- Hormone testing
- Gut function and flora
- Omega 3 Index
  - DHA and EPA levels
  - Omega 6: omega 3 ratio
- Correct nutritional deficiencies!!
Nutrients Linked to Telomeres

- Calcium
- Folate
- B Vitamins
- Choline
- Manganese
- Vitamin E
- Vitamin D
- Vitamin C
- Glutathione
- Selenium
- Cysteine
- Zinc
- Copper
- Magnesium
Nutrient Effect on Telomeres

Magnesium
- Regulates chromosome separation in cell replication
- Induced deficiency shortens telomeres in rat livers

Zinc
- Cofactor for DNA repair enzymes
- Key role in regulating inflammation

Manganese & Copper
- Cofactor for superoxide dismutase (powerful antioxidant)
- Deficiency of superoxide dismutase lowers telomerase activity

Calcium
- Cofactor to prevent DNA replication errors
Nutrient Effect on Telomeres

Selenium
- Selenoproteins (selenium attached to amino acids) protect DNA (about 25 selenoproteins exist)
- In vitro supplementation extended telomeres in liver cells

Cysteine
- Stem cell treatment with N-acetyl cysteine corrects DNA damage in telomeres

Glutathione
- Interference with glutathione dependent antioxidant defenses accelerates telomere erosion
**Nutrient Effect on Telomeres**

**Vitamin E**
- Enhances DNA repair
- Removes damaged DNA
- Shown to restore telomere length in human cells in vitro

**Vitamin C**
- Protects DNA from oxidation
- Slows telomere shortening in human skin cells in vitro

**Vitamin D**
- Higher vitamin D levels linked to longer leukocyte telomeres
Nutrient Effect on Telomeres

Folate
- Influences telomere length via DNA methylation
- Telomere length of peripheral blood mononuclear cells associated with folate status in men

Vitamin B3
- Extends lifespan of human cell in vitro
- Slows telomere attrition rate by reducing free radicals in mitochondria

Vitamins B2, B6, B12 and Choline
- Crucial for proper DNA methylation
A Multi-Vitamin Does Not Necessarily Prevent Deficiencies

- Multiple deficiencies with no previous supplementation: 38%
- Multiple deficiencies with previous supplementation: 43%
- Subjects showing no deficiency: 19%

This study was done on a “healthy” population (around 5000 patients)
Many Things Affect Nutrient Status...

- Dietary Intake
- Absorption
- Transport
- Storage
- Receptors
- Activation
- Inhibition
- Metabolism
- Excretion
- Hormonal Status
- Genetic Influences
- Disease
- Lifestyle Factors
- Pharmaceuticals
- Gender
- Socioeconomics
- Ethnicity
- Pregnancy
- Exercise
- Tobacco / Alcohol
- Age
Telomere Score

Green box = Above average score
Red box = Below average score

Percentile Relative to Population

Graph
How to Interpret Results

Telomere Test Results

Mean Telomere Score

Chronological Age = 48 years old
How to Interpret Results

Chronological Age = 48 years old
Biological Age = 37 years old
How to Interpret Results

Chronological Age = 48 years old
How to Interpret Results

Chronological Age = 48 years old
Biological Age = 55 years old
Case Study Review
Telomere Test: *Frequently Asked Questions*

How often should you test?  *Yearly*

How much blood?  *2 ml whole blood, room temperature*

Turn around time?  *5-7 business days*
The Fatigue Solution will show you how you can go from fatigued to fabulous by following eight simple steps that can help you identify and understand the potential source of these vexing health conditions. It is a 21st century woman’s health guide for generating physical as well as emotional strength, balancing hormones, reclaiming sexual vitality, and restoring energy. Dr. Eva Cwynar, premier Beverly Hills Endocrinologist and Metabolic Medicine Specialist, who has treated prime ministers, A-list actors, and professional athletes, shares her program for rejuvenating and reinvigorating your life.

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