

# Aging, Inflammation, and Longevity

OHCC Swim, Surf and Wellness Club  
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# Aging Stats

- The global population of people over 65-years-of-age will go from 6.9% to 12% in the next decade!
- By 2050 the population of people over 65-years-of-age is estimated to be 28.5%!



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# Presentation Objectives

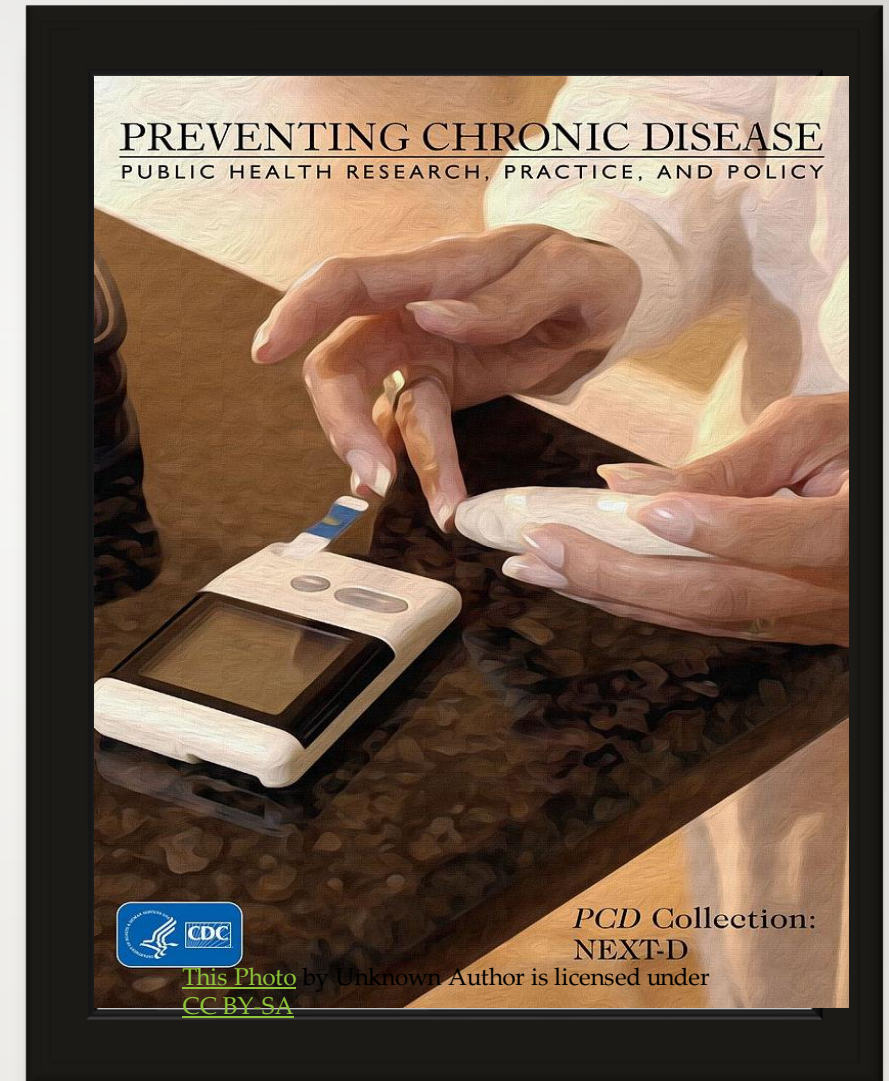
- Appreciate the connection between healthy aging and longevity
- Consider clinical disease consequences of chronic inflammation
- Gain awareness of the clinical benefits of ongoing deliberate lifestyle interventions to minimize or prevent chronic diseases and promote a happy, healthier, longer life
- Be familiar with current outcomes research on aging and longevity



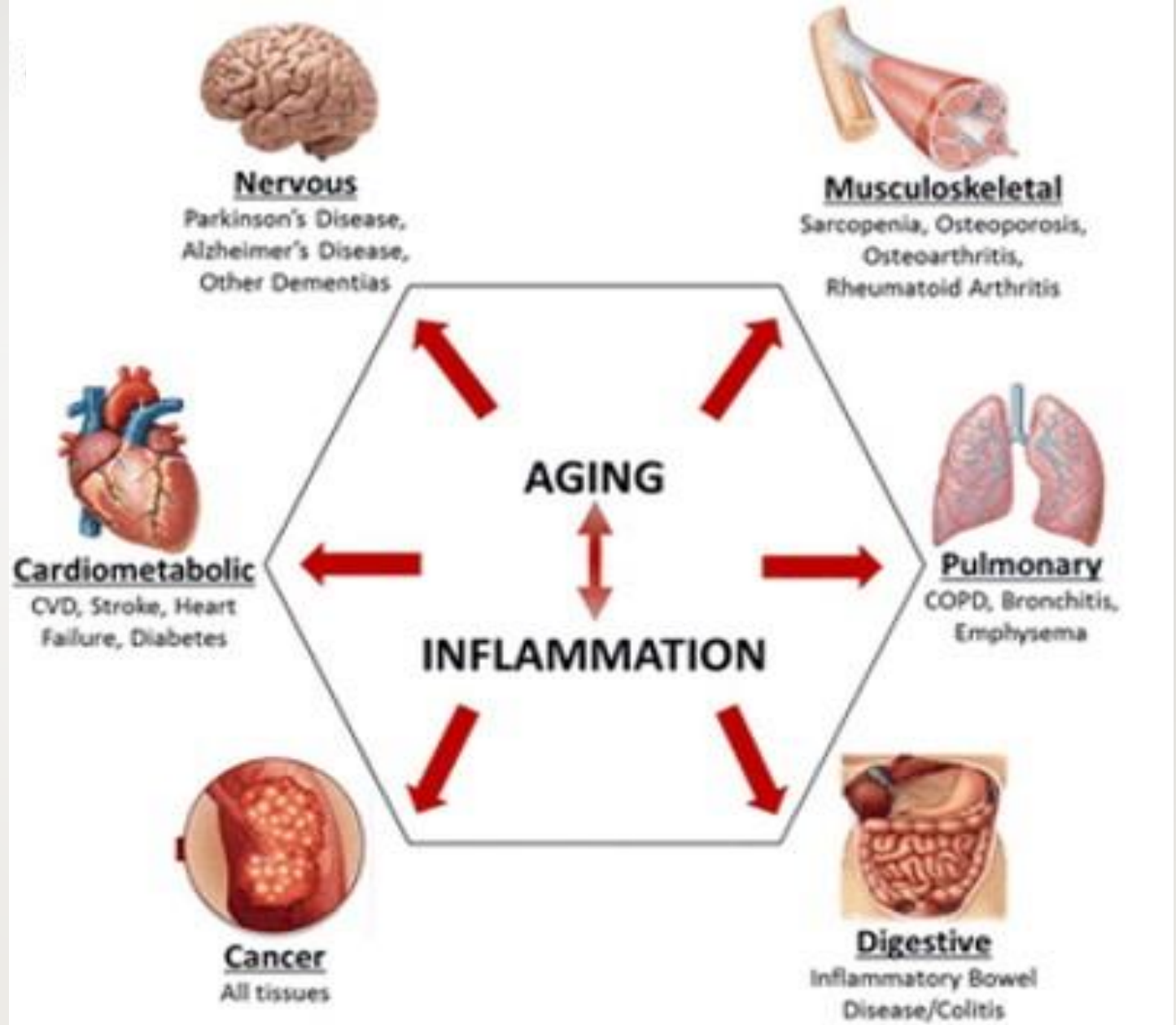


# As we age.....

- By retirement, typical adults have at least one chronic disease, i.e., obesity, diabetes, cardiovascular disease, hypertension, or other chronic inflammatory diseases
- Most people manage their chronic disease, but very few go back to pre-chronic disease “normal”.



# Hallmarks of Aging



# Aging and Inflammatory Connection

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**“The biggest risk factor for chronic disease is age.”**



**Dr. Gerald Shadel,  
Researcher, Salk  
Institute, Optimal  
Aging Initiative**



***Chronic Inflammation - accelerates the aging process:***

***Example: **Sarcopenia** – a progressive loss of muscle mass and function***

***Skeletal muscle mass and function (strength, and mobility) has a significant impact on overall health and quality of life.***



# Aging and Mitochondrial Dysfunction

- **Two key hallmarks of aging, owing to mitochondrial dysfunction**
  - Decrease in ATP production
  - Long-term oxidative damage to cells because of increased production of reactive oxidative species (ROS)
- **Recent Research Studies:** age-related mitochondrial dysfunction is modifiable through health behaviors such as exercise, diet and other lifestyle variables such as getting enough sleep and keeping on one's circadian rhythms, and other factors that reduce stress e.g., “**Blue Zones Factors**”.

# Mitochondrial Function and Its Impact on Sarcopenia

- **Mitochondrial dysfunction** is a significant factor that accounts impairments in aerobic capacity, gait speed, grip strength, and leg strength
- Long-term chronic stress to the body leads to mitochondrial adaptive mechanisms to be impaired, resulting in inflammation and increased cellular oxidative damage (increased ROSs)
- **Recent Research:**
  - Demonstrates mitigation of cellular oxidative damage through **mitohormesis**





# Mitohormesis

A process wherein reactive oxygen species (ROS) produced by mitochondria at a low concentration act as signaling molecules to initiate a cascade of cellular events that ultimately protect the cells from harmful effects.

Gerald Shadel, Salk Institute

**Effect of Regular  
Mild to Moderate  
Exercise on Clinical  
Laboratory Markers  
Related to CVD and  
Diabetes**

<b>Lipids and Lipoproteins</b>	<b>Effect After Long-Term Exercise</b>	<b>Interpretation</b>
<b>Triglycerides</b>	<b>Decrease</b>	<b>The most consistent lipid change</b>  <b>Trained individuals show consistent decrease</b>
<b>Total Cholesterol</b>	<b>Decrease or NC</b>	<b>Decreased values inconsistently found in trained individuals</b>
<b>LDL-Cholesterol</b>	<b>NC or Decrease</b>	<b>Trained individuals typically show a consistent decrease</b>
<b>HDL- Cholesterol</b>	<b>Increase or NC</b>	<b>Trained individuals typically show a consistent increase</b>

# Effect of Exercise on Clinical Laboratory Tests Related to CVD and Diabetes

<b>Hormone or Substrate</b>	<b>Change After Exercise</b>	<b>Time to return to Baseline Concentration</b>
<b>Insulin</b>	<b>Decrease up to 50%</b>	<b>½ to 2 hours</b>
<b>Glucose</b>	<b>NC or slight ↑ or ↓</b>	<b>½ to 2 hours</b>



# Importance of Enough Sleep and Longevity

If you don't get your ZZZs..

- Skin wrinkles and sags earlier
- Insulin sensitivity declines – associated with obesity and pre-diabetes
- Body's detoxification system, through clean up of toxic debris is compromised

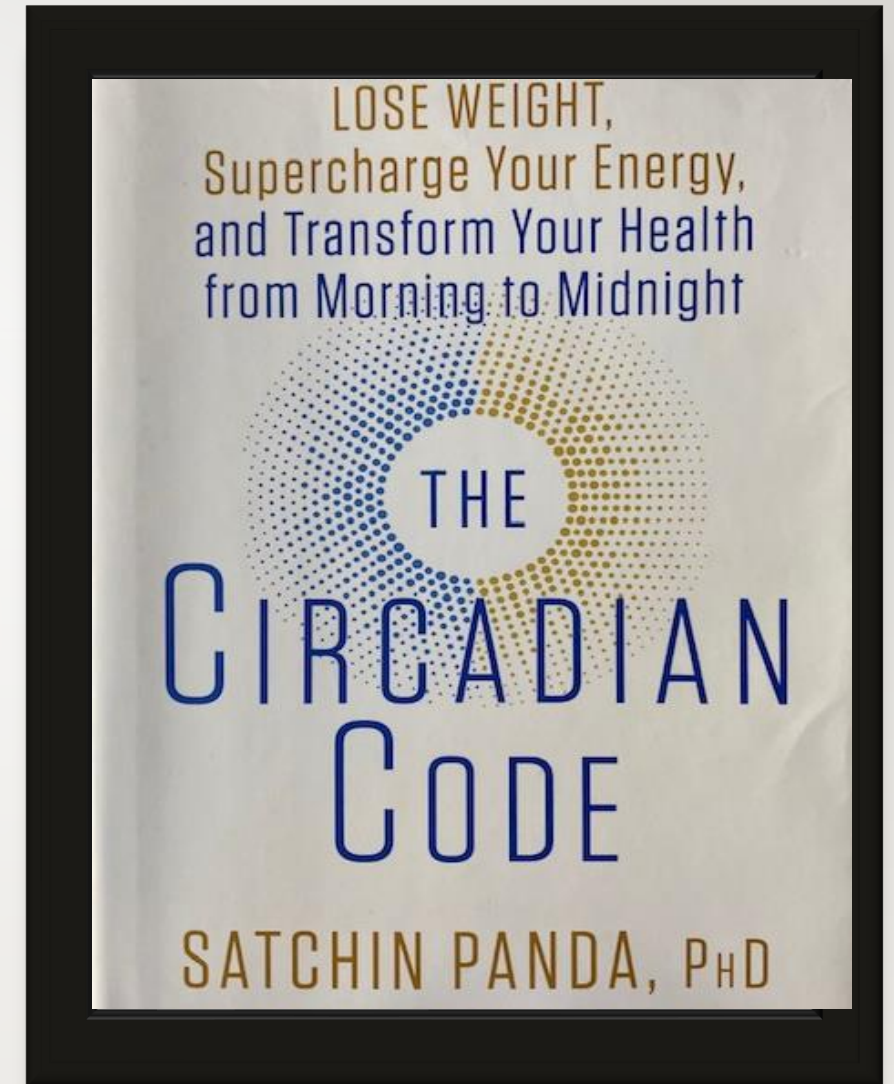




# Addressing Your Circadian Clock for Health Benefits

- Know when to eat!
- Know when to turn off the lights and sleep!
- Get the benefit of some sunlight!

NOTE: Consider time restricted eating (TRE) for weight-loss and longevity

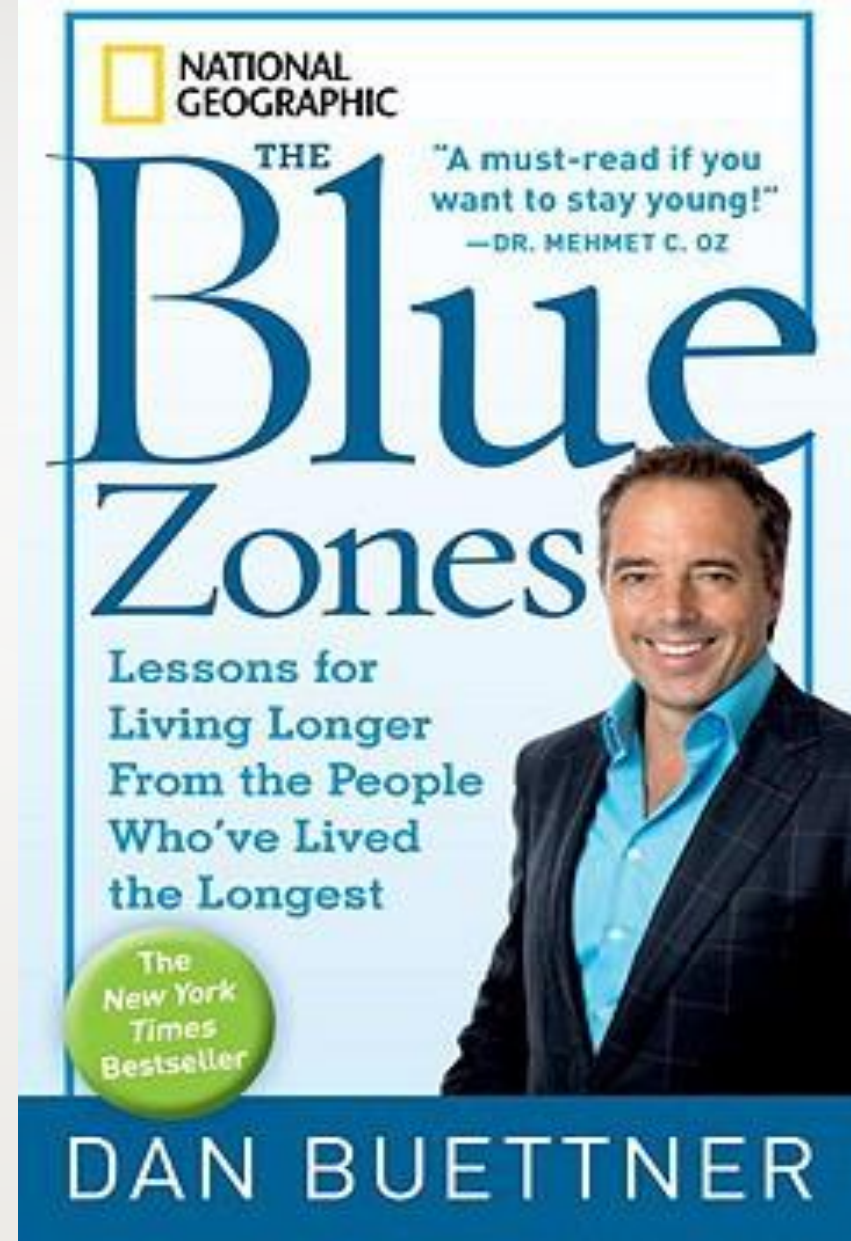


# Top Determinants of Longevity

- “Blue Zones Quest” – Study of healthy centenarians

- Blue Zones Project®

*Helping transform communities across North America into areas where the healthy choice is easy, and people live longer with a higher quality of life.*



# Blue Zones - Nine Lessons Learned

## LESSON #1 – Get Moving!

***“Inconvenience” yourself***

- Take more steps
- Make a date to play tennis, walk play pickleball, swim or go surfing with a friend or enroll in yoga, Tai Chi, or Qi Gong
- Take the stairs



# Blue Zones - Nine Lessons Learned

## LESSON #2 – Hara Hachi Bu

***Eat only till you are 80% full***

- Serve and store food
- Make the food look bigger
- Use smaller plates and taller glasses
- Sit and eat slowly





# Blue Zones - Nine Lessons Learned

## LESSON #3 – Have a Slant on Plants

***Incorporate more plants in your diet***

- Strive for at least 2 veggies per meal
- Include nuts daily
- Minimize servings of meat
- Include protein especially beans
- No processed foods and showcase veggies and fruits



# Blue Zones - Nine Lessons Learned

## LESSON #4 – Grapes of Life

***Drink red wine in moderation***

- One to two glasses per day
- Buy high quality wine
- Treat yourself to “Happy Hour”
- Take it easy!



# Blue Zones - Nine Lessons Learned

## LESSON #5 – Have Purpose

*Take time to see the big picture*

- Why I wake up in the morning
- Activities you love
- Using your talents



# Blue Zones - Nine Lessons Learned

## LESSON #6 – Downshift

### *Take a break!*

- Rest the mind
- Rest the body
- Socialize
- Mediate or do yoga, Tai chi or Qi gong
- Reduce noise and have a “sanctuary space”
- Watch the sunset





# Blue Zones - Nine Lessons Learned

## LESSON #7 – Belong

**Nurture your spirituality**

- Be more involved in community
- Explore new traditions and faiths
- Volunteer
- Sing in the choir



# Blue Zones - Nine Lessons Learned

## LESSON #8 – Loved Ones First

*Put family first*

- Stay close to family members
- Establish rituals
- Respect and include elders
- Celebrate your ancestry



# Blue Zones - Nine Lessons Learned

## LESSON #9 – Right Tribe

*Surround yourself with those who share the  
“Blue Zones” Values*

- Identify your inner circle
- Be likable – not a grump!
- Create more purposeful time with your tribe



# Health and longevity is a journey, not a destination

A commitment to:  
movement, emotional health,  
purpose, mindset, and a sense  
of a supportive community,  
correlates with a happier,  
healthier, longer life!



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**“You can’t stop the waves of change, but you can learn to surf them!”**