



The Chilmark Longevity Series #6

Stress, Sleep, and Recovery

the long game
Jim Lobley, MA, CPT

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The Chilmark Series on Longevity



#1: Longevity: A Start-up Guide #2: Mobility: Priming the Body for Movement #3: How to Train Your Balance

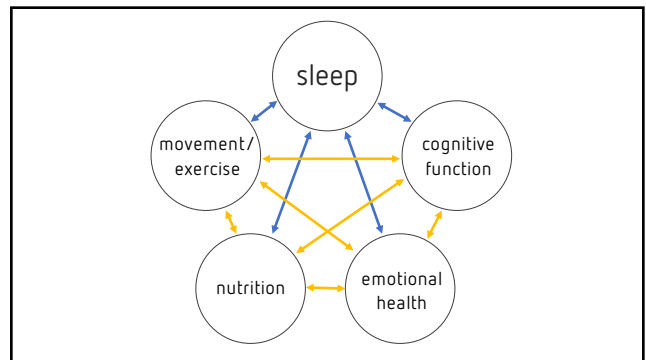
#4: Smart Body – Healthy Brain: Movement for brain health #5: Eating for Longevity #6: Stress, Sleep, and Recovery

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My background and training...


- MA in Dance/Movement Therapy, NYU
- Certified Personal Trainer, National Academy of Sports Medicine (NASM)
- Certified Brain Health Trainer, Functional Aging Institute
- Corrective Exercise Specialist (NASM)
- Athletic Performance Training Specialist (NASM)
- Sleep, Stress, and Recovery Coach (in process)
- Precision Nutrition, Level 1
- High School Science Teacher (Physics and Chemistry)

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A little effort, made consistently, wins the long game.



Mastering the basics and doing them consistently is almost always enough for optimal fitness, health, body composition, performance, and life balance.

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Key takeaways

Stress

- The sources of stress are extremely varied
- It affects nearly every aspect of our being
- Our perception of stress largely determines our response

Sleep

- Sleep is an evolutionary adaptation to bring the organism back into equilibrium from the stresses encountered during wakefulness
- It ameliorates nearly every aspect of our being, and is the cornerstone of our recovery system

Recovery

- The body returning to baseline, or homeostasis
- A measure of the body's readiness to take on strain and perform

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The Deep Health perspective

Social
Connected to and authentic with others in safe and secure relationships. Feeling supported and like you belong.

Physical
Feeling vibrant, energetic, and thriving. Performing and functioning well.

Emotional
Experiencing a full range of emotions, recognizing and regulating them appropriately.

Environmental
Your everyday surroundings support your wellbeing.

Mental
Alert, focused, confident, and thoughtful. Learning, remembering, and solving problems well.

Existential
Feeling a sense of meaning and purpose in life.

Deep health

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Homeostasis

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Understanding stress

- A **stressor** is the stimulus that disrupts homeostasis.
- A **stress response** is how we physiologically react to that disruption.
- **Stress** is our *perception* of that disruption as good or bad, manageable or unmanageable, and so on. It also involves our *awareness* of our response — whether we even notice those physiological changes or view them as significant.

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The sources of stress

Social
Connected to and authentic with others in safe and secure relationships. Feeling supported and like you belong.

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Deep health

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Good stress (eustress) vs. bad stress (distress)

Good stress:

- is short-lived, infrequent, and over quickly (in a matter of minutes or hours)
- can be part of a positive life experience
- inspires us to action
- is related to skills that we have or challenges we enjoy
- helps build us up — it leaves us better than we were before

Bad stress:

- lasts a long time
- is chronic and ongoing
- is negative, depressing, and demoralizing
- de-motivates and paralyzes us
- breaks us down — it leaves us worse off than we were before

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The stress-response-recovery cycle

Homeostasis

Stressor

Alarm phase:

- We need fuel, so we start mining our muscle, liver, and bloodstream for available nutrients.
- Heart rate increases
- We breathe faster and deeper
- Stress hormones such as epinephrine (adrenaline) and cortisol are released into the bloodstream. These free up stored fuel and activate our immune system.
- Sympathetic nervous system (fight or flight) may get activated.

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The stress-response-recovery cycle



- Immediately after the workout:**
- metabolic byproducts build up;
 - our body temperature increases;
 - our fuel stores of glucose and *glycogen* are briefly depleted in our blood, liver, and muscles; and
 - our muscular and central nervous systems put on the brakes to slow us down
 - We may be thirsty if we've lost water through sweating and breathing more.
 - Our immune system is briefly activated (for a few minutes), but then becomes depressed for a few hours while we recover from the workout.
 - We may have *microdamage* to our muscles and other tissues that includes protein breakdown.
 - Inflammatory hormones and *cytokines* get to work as "early responders" who deal with this cellular damage by activating the inflammatory pathway so we can heal and regenerate tissues.

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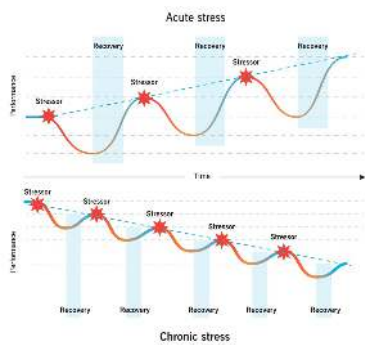
The stress-response-recovery cycle



- We recover and rebuild.**
- Over the next several days, we'll recover and rebuild any tissues that have been damaged — so long as we:
- get enough sleep and enough nutrients;
 - don't have too many other stressors accumulating; and
 - have no other serious illness or deep health issues (such as a compromised immune system) that makes regenerating difficult.

- During this process, we get stronger and more resilient against future stressors. For instance, over the long term:
- We improve our energy transfer, and eventually, become more energetic as our mitochondrial efficiency and density go up.
 - Our immune system becomes more robust.
 - We build stronger muscles and replenish glycogen; we build new proteins and clear out the damaged old ones.
 - Inflammation decreases and our body's "cleanup crew" (such as *macrophages*) clears out cellular wastes and debris.
 - We learn to move more efficiently, and in more diverse ways.

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Our perception of stress can determine how our body responds.

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Monitoring strain, sleep, and recovery with a Whoop strap



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Stress can creep up on us

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The nervous system as regulator

"the SNS and the PNS are highly coordinated to maintain physiological homeostasis"

Figure 22
Sigmund Freud, *Psychological Concepts*, 4th ed. © 2017 Worth Publishers

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Autonomic nervous system

- Functionally distinct
- Continuously active

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Sympathetic Nervous System (SNS) activation

- Increases heart rate and blood flow
- Increases synthesis and secretion of norepinephrine and epinephrine from adrenal gland
- Increases production of cortisol (stress hormone)
 - Increases blood glucose levels
 - Enhances brain's use of glucose
 - Increases availability of substances that repair tissues

Parasympathetic Nervous System (PNS) activation

- Increased production of the neurotransmitter acetylcholine
- Decreases heart rate
- Promotes digestion
- Inhibits production of glucose in the liver

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Sunday night Monday night Last night

SNS activation, cortisol, and sleep

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Basic strategies for managing stress

- Cognitive reframing
- Conjuring a feeling of well-being
- Breathing mindfully
- Getting outdoors ("forest bathing")
- Hiking, walking, or other exercise
- Warm baths, or cold immersion!
- Taking action
- Focusing on sleep
- Other...

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Matching the intervention to the source(s) of stress

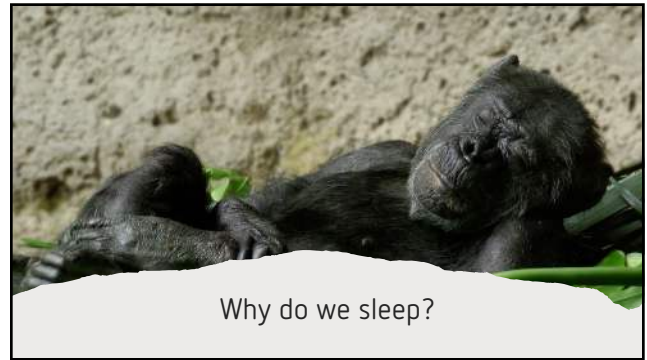
Deep health

- Social:** Connected to and involved in activities with others; positive, trusting relationships that give meaning.
- Physical:** Healthy practices of exercise, and drinking, eating, and sleeping.
- Emotional:** Experiences a full range of emotion and responds to and regulates them appropriately.
- Environmental:** Has a comfortable, safe, and supportive living and working environment.
- Mental:** Has a healthy, resilient, and flexible cognitive and emotional functioning.
- Existential:** Has a sense of meaning and purpose in life.

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The physical benefits of sleep

- Clears out waste products (especially in our brain)
- Regulates our metabolism, including helping to manage our blood sugar and lipids
- Regulates our hunger and appetite
- Maintains a healthy cardiovascular system, including blood pressure
- Maintains balance and coordination (which helps prevent falls and other accidental injuries)
- Supports bone health
- Promotes physical repair, including DNA repair (which helps decrease cancer risk)
- Manages pain and inflammation
- Promotes healthy kidney function and fluid-electrolyte balance
- Promotes respiratory health, including managing asthma or lowering our risk of upper-respiratory tract infections

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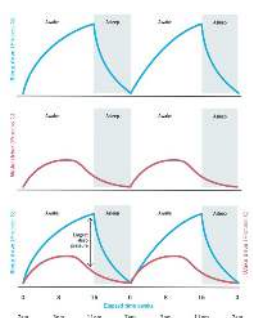
The cognitive benefits of sleep

- improves our mood and the ability to manage our emotions
- make us less impulsive (which helps us make better decisions)
- helps us learn and remember
- improves cognition, concentration, and attention
- keeps our brains healthy

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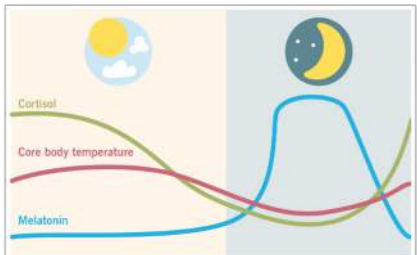
Circadian rhythm and sleep pressure

- A 24-hour cycle that is part of the body's internal clock, running in the background to carry out essential functions in the body.
- Sleep pressure is an unconscious biological response that makes us want to go to sleep
- The balance between both the circadian rhythm and sleep pressure will determine how alert you are during the day and how well you sleep
- The 2 ways that we regulate the circadian rhythm functionally is through our eyes and mouth

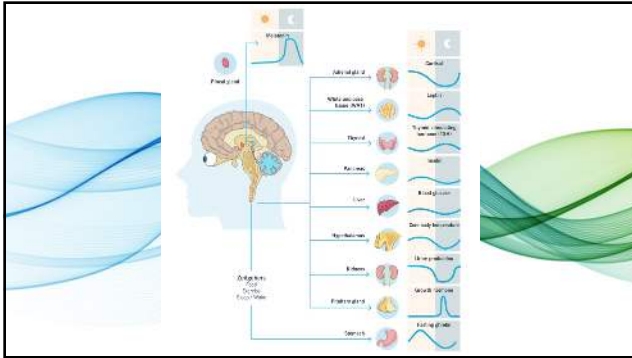


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Sleep harmonizes the body, and vice versa



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The 4 stages of sleep

NREM - stage 1 (N1): Transitional sleep
light sleep, progressive transition between wakefulness & sleep

NREM - stage 2 (N2): Light sleep
Muscles relax, heart rate and body temp start to drop

NREM - stage 3 (N3): Deep/Slow wave sleep (SWS)
Delta waves; metabolic rate slows significantly, blood pressure & breathing rate drop, body repairs tissues

REM - stage 4: Dreaming
Brain activity increases while body relaxes further, becomes immobilized

The EEG graph shows the characteristic wave patterns for each sleep stage. Stage 1 shows theta waves, Stage 2 shows sleep spindles and K-complexes, Stage 3 and 4 show large delta waves, and REM shows a pattern similar to wakefulness.

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Nightly sleep cycles

- Each sleep stage has its own particular benefits, and all of them work together.
- We need *all* of them to feel and function our best.

The bar chart shows the typical distribution of sleep stages over an 8-hour period. It includes Awake, REM, Stage N1, Stage N2, and Stage N3 (SWS). The chart shows that REM sleep occurs multiple times throughout the night, and SWS is most prominent in the first half of the night.

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My typical sleep cycles

The five smartphone screens show various sleep cycle tracking applications, displaying graphs of sleep stages and statistics for different nights. The screens show the progression of sleep stages over time, with REM sleep occurring periodically throughout the night.

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Sleep efficiency

What percentage of the time that you're "sleeping" are you actually asleep?

The image shows a person sleeping in a bed, with two smartphone screens displaying sleep tracking data. The screens show the percentage of time spent in different sleep stages and the overall sleep efficiency.

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Sex, gender, and sleep

Our perception of how we sleep can affect our sleep, or our experience of it.

In other words, our thoughts and feelings about how we sleep (or don't sleep) shape our sleep habits and patterns.

Indeed, women are at a greater risk for developing insomnia, which aligns with their heightened perceptions of sleeping poorly.

They worry about sleeping badly, which leads to worse sleep.

The image shows a man and a woman sleeping in a bed, illustrating the concept of sex, gender, and sleep.

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What we think...

On average:

- Women tend to *think* they sleep worse than they *actually* do.
- Men tend to *think* they sleep better than they *actually* do.

For instance, when asked about their sleep habits, healthy adult women regularly report having **worse quality sleep** than healthy, adult men.

Using questionnaires and self-reports to assess sleep patterns and habits, sleep scientists have found that compared to men, women more often report:

- not getting enough sleep;
- poorer quality sleep;
- more sleep disruptions;
- a greater need for sleep; and
- more time spent in bed overall.

What the data shows...


In fact, sleep data often reveals that women have *better* quality sleep with *fewer* nighttime interruptions than their healthy male counterparts.

For example, when comparing sleep data from women and men, scientists have found that women:

- have a longer total sleep duration compared to men;
- spend more time in slow-wave sleep
- spend less time in light sleep over the course of the night compared to men; and
- wake up less often during their sleep cycles compared to men.

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Basic practices for getting a good night's sleep




- Aim for consistent sleep and wake times
- Lower temperature in bedroom
- Reduce light exposure before bed
- Try not to eat 2-3 hours before bed
- Pay attention to your drowsiness cue at night
- Have the digital clock facing the wall, not facing you
- Check in on your stress levels during the day. Try to incorporate short stress-breaks.
- Develop a bedtime ritual
- Try not to stress about sleep

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Sleep supplements and aids


- Magnesium
 - Helps muscles relax; may enhance melatonin secretion
 - Found in Mg-rich foods
 - Levels tend to decrease as we age
 - "Supplementing with magnesium for several weeks has been shown to not only improve total sleep time and sleep efficiency, but also decrease sleep latency and early morning awakenings."²⁴
 - Recommended dose: 200-400 mg daily, afternoon or evening
- Melatonin
 - Naturally secreted by pineal gland in evening
 - Time-release may help you stay asleep
- Tryptophan and 5-HTP
- Glycine
- CBD, others...



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Cognitive Behavioral Therapy for Insomnia (CBT-i)

- Explores the connection between the way we think, the things we do, and how we sleep
- Results are equivalent to sleep medication, with no side effects, fewer episodes or relapse and a tendency for sleep to continue to improve long past the end of treatment
- Long-term improvements from learning how to support and promote the body's natural sleep mechanism



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Screens and sleep



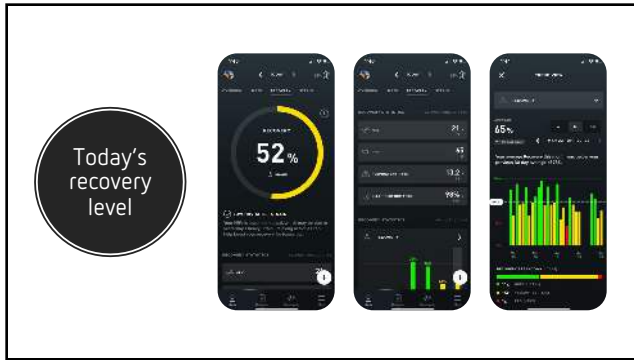
- Our eyes respond to evening darkness by sending a message to the part of the brain which controls our circadian rhythms (the *suprachiasmatic nucleus (SCN)*).
- This signals the *pineal gland* to synthesize and release *melatonin*, our main sleep-promoting hormone.
- The light emitted from screens inhibits this signal, which then shuts down our production of melatonin and impairs our ability to fall asleep, or to sleep restfully.
- A study that looked at the difference between reading a paper book vs. an iPad screen found that even when someone gets 8 hours of sleep after reading on a bright screen, their sleep quality is still impaired.
- The diminished melatonin production caused by screens makes it harder to fall asleep. Once we do fall asleep, it's also less restful, with less time spent in REM stages.

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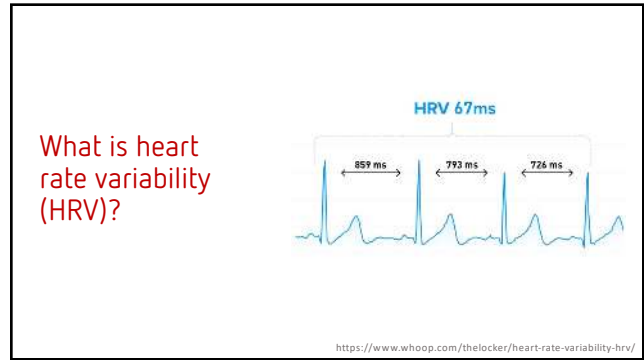


Recovery

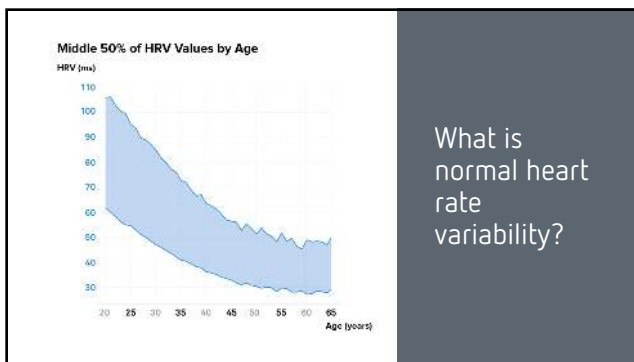
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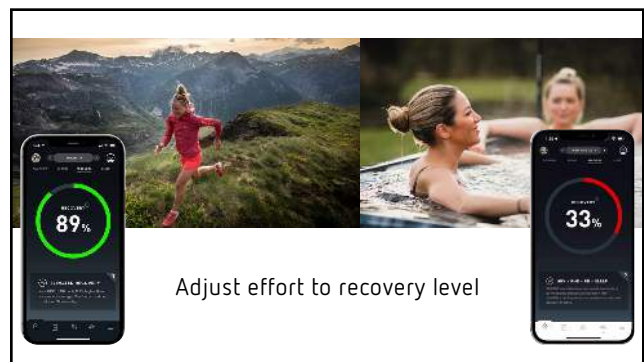
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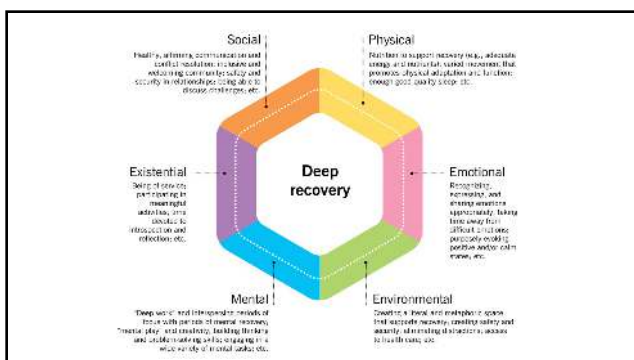
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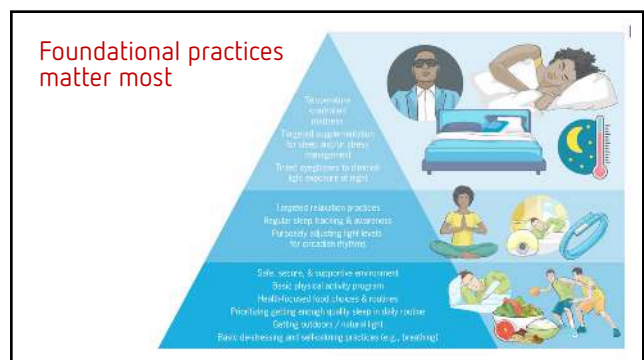
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SYSTEM	WHAT IT INCLUDES	INFLUENCE ON LONGEVITY
CARDIOVASCULAR- RESPIRATORY SYSTEM	Heart, blood, blood vessels, and lungs	Heart disease is the #1 cause of death worldwide. It's crucial to take care of it to avoid a bad quality of health and longevity.
MUSCULAR	Adapt, participate, and fit in to social programs, meet friends, etc. produce mental energy, vitality	The muscle strength is not so much to reduce weight, but to reduce the risk of falls, fractures, and hospitalizations. It's important to have a good muscle mass to avoid the risk of falls, fractures, and hospitalizations.
MUSCULOSKELETAL	Bones, muscles, ligaments, tendons, and cartilage	As we age, our bones become weaker and our muscles atrophy. This can lead to a loss of independence and quality of life. It's important to take care of our bones and muscles to avoid the risk of falls, fractures, and hospitalizations.
PSYCHOLOGICAL WELL-BEING	Emotional health and social functioning	Loneliness and social isolation are linked to a higher risk of death. It's important to have a good social network and emotional health to avoid the risk of death.

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The Flourishing Scale

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1. I feel good about my life.	7	6	5	4	3
2. I feel good about my future.	7	6	5	4	3
3. I have good relationships with others.	7	6	5	4	3
4. I have good personal goals.	7	6	5	4	3
5. I have good health.	7	6	5	4	3
6. I have good financial resources.	7	6	5	4	3
7. I have good living conditions.	7	6	5	4	3
8. I have good social support.	7	6	5	4	3

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Dynamic Flow - Full body mobility and balance practice – online

- Intro Level, Tues & Thurs mornings
- Ongoing, Wed & Fri mornings
- 8 – 8:30 am
- Register online at: thelonggame.coach/schedule



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Contact me to be on mailing list

Text me your name and email address:

413-695-8766

or email me:

jlobley@gmail.com

Or log on to the website

www.thelonggame.coach

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