

Optimal Aging: Strategies for Life



Tieraona Low Dog, MD

National Geographic Author:
"Fortify Your Life",
"Healthy At Home"
"Life Is Your Best Medicine"
Guide to Medicinal Herbs

www.DrLowDog.com

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Reflection

- What if someone could predict with 90% accuracy how long you will live?
- Would you want to know?
- How would it affect the way you live?
- What if you planned to live to 100?
- Would it change the way you...
 - work and play?
 - manage your money?
 - spend time with your family?



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When Does “Late Life” Begin?



- Studies have defined older populations in different ways: some as 65 and older, others at 60, and some at 50.
- Consensus seems to be growing:
 - Young-old: 65-80 years
 - Old-old: 80-99 years
 - Oldest-old: centenarians

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The Oldest of the Old



- In 1997, the oldest person to have ever lived died at age **122 years and 164 days**. **Jeanne Louise Calment** lived in France, took up fencing at age 85, and still rode a bicycle at 100.
- She was from a family of long-lived persons: her father died at age 93, her mother at 86, and her brother at age 97.
- She **quit smoking when she was 117**, reportedly because she was nearly blind and felt embarrassed asking for a light.

www.managedhealthcareconnect.com/article/7994

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What is “Optimal” Aging?



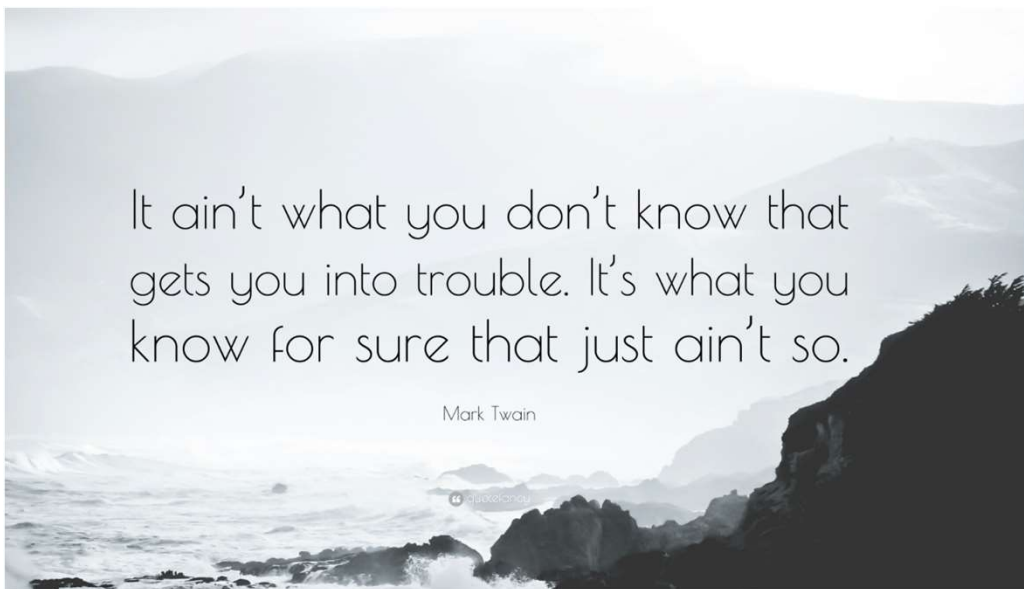
The capacity to **function across many domains—physical, functional, cognitive, emotional, social and spiritual—to one's satisfaction and in spite of one's medical conditions.**

To live a life that is *meaningful, fulfilling, and relatively independent.*

Brummel-Smith K, Optimal Aging, Part I: Demographics and Definitions, *Annals of Long-Term Care*, 2007; 15: 26 – 28

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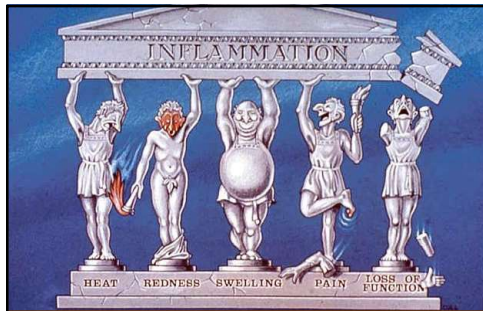


It ain't what you don't know that gets you into trouble. It's what you know for sure that just ain't so.

Mark Twain

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Chronic Inflammation

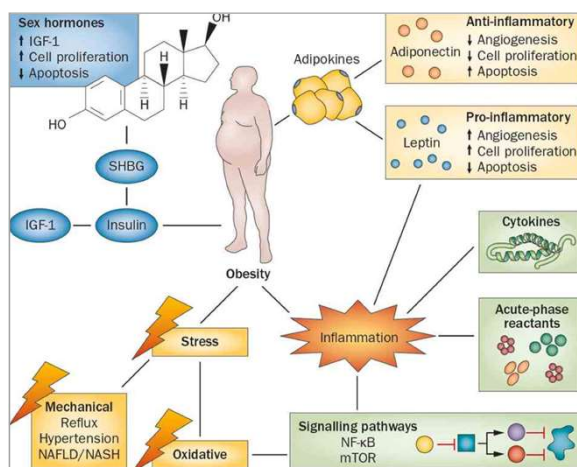
- Inflammatory response crucial for our survival. But there is a dark side.
- When **inflammation becomes chronic** it contributes to conditions as varied as **gum disease, osteoporosis, cardiovascular disease, Alzheimer's disease, type-2 diabetes, autoimmune disorders, cancer, and more.**

Chang SC, Yang WV. *Crit Rev Oncol Hematol* 2016; 108:146-153

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Inflammaging



- **Obesity + aging drastically increases chronic low-grade inflammation:** a key link between **obesity, insulin resistance, elevated blood sugar, insulin-growth factors (IGF), and age-associated diseases.**
- **Elevated insulin and IGF increases tumor growth and aggressiveness.**

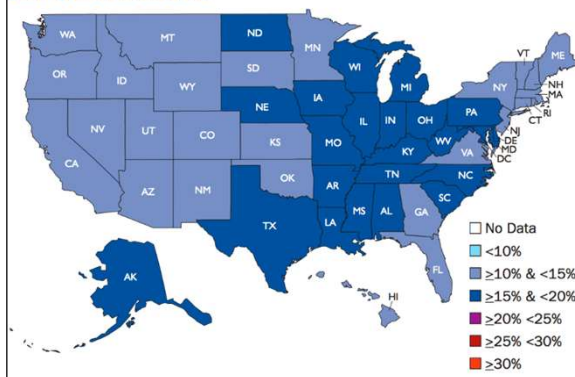
Frasca D, et al. Aging, Obesity and Inflammatory Age-Related Diseases. *Front Immunol* 2017 Dec 7;8:1745.

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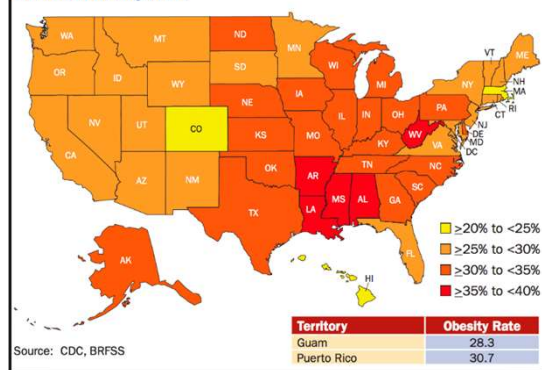
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The Changing Landscape of Adult Weight

1993–1995 Combined Data



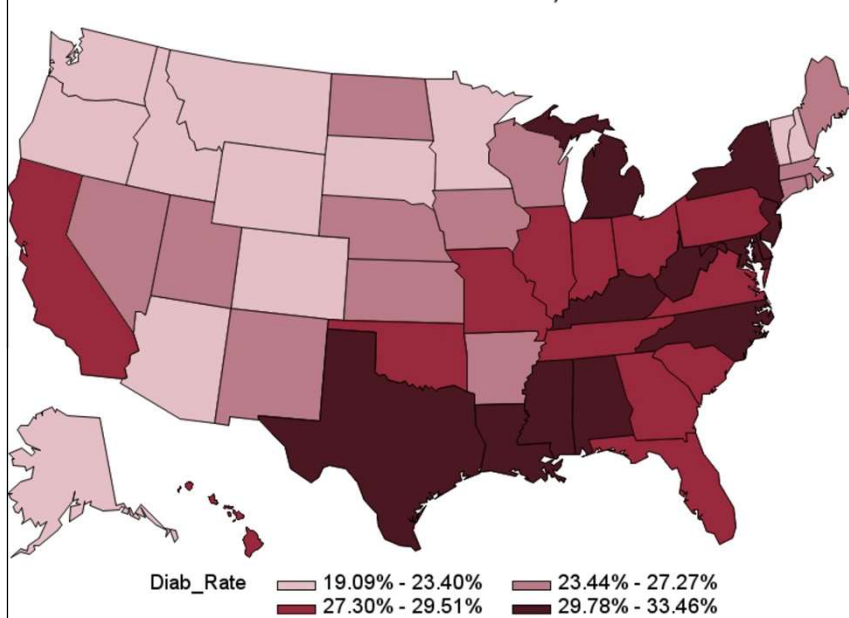
2016 Adult Obesity Rates



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Diabetes Period Prevalence, 2015



<https://www.ccwdata.org/web/guest/medicare-charts/medicare-chronic-condition-charts>

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SCIENTIFIC
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PUBLIC HEALTH

The Hunger Gains: Extreme Calorie-Restriction Diet Shows Anti-Aging Results

A new study shows five days of hunger a month may reduce risk factors for aging and age-related diseases

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Caloric Restriction?



Canto is 27 year old monkey on CR diet, Owen is 29 year old on unrestricted diet.

news.wisc.edu/monkey-caloric-restriction-study-shows-big-benefit-contradicts-earlier-study/

Ravussin E, et al. : A 2-Year Randomized Controlled Trial of Human Caloric Restriction: Feasibility and Effects on Predictors of Health Span and Longevity. *J Gerontol A Biol Sci Med Sci*. 2015;70(9):1097-104

- 25 year study University of Wisconsin: **76 rhesus monkeys ages 7-14 years**, fed a diet reduced in calories by 30%.
- **Disease was 3 fold greater in control group.** No evidence of diabetes in any caloric-restricted animal.
- NIA **2-year** study randomized 218 non-obese people to current diet or 25% caloric restriction (**11.7%** on average).
 - **Statistically significant reduction in inflammatory markers, weight loss, improved mood, sleep duration, etc.**

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Fasting-Mimicking Diets



Wei M, et al. Fasting-mimicking diet and markers/risk factors for aging, diabetes, cancer, and cardiovascular disease. *Sci Transl Med* 2017; 9(377).

- USC study **100 healthy people** randomized into 2 study arms to test effects of FMD done 5 consecutive days each month for 3 months.
 - **1100 calorie first day, 700 calories for 4 days (plant based, multivitamin).** Ate whatever they wanted rest of the month.
- Three cycles reduced **body weight, total body fat; lowered blood pressure, cholesterol, triglycerides and IGF-1.**
- Note: **25% drop-out rate**
- **Effects still noted 3 months AFTER study ended.**

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Glycemic Index/Load

- **Glycemic load** measurement of impact of carbohydrates on blood sugar/insulin.
- International **consensus** conference concluded that given the **consistency of the scientific evidence**, diets **low in glycemic index/load** should be promoted in the **prevention and management of diabetes and coronary heart disease**, and are **particularly important in individuals with insulin resistance.**

Augustin LS, et al. Glycemic index, glycemic load and glycemic response: An International Scientific Consensus Summit from the International Carbohydrate Quality Consortium (ICQC). *Nutr Metab Cardiovasc Dis* 2015 Sep;25(9):795-815.

Low GI Diet Tracker
App: \$3.99



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Dietary Inflammatory Index (DII)

- Inflammation often driven by dietary patterns. An anti-inflammatory diet may reduce **sub-chronic inflammation** and improve **cardiovascular, metabolic, and neurologic parameters**.
- The **Dietary Inflammatory Index** is based on measuring inflammation in the body in response to specific foods (many clinical trials).
- You can take the test by **downloading the app for Dietary Inflammatory Index** (Itunes: DII Screener)

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Inflammatory Food Ratings

200 or higher	Strongly anti-inflammatory
101 to 200	Moderately anti-inflammatory
0 to 100	Mildly anti-inflammatory
-1 to -100	Mildly inflammatory
-101 to 200	Moderately inflammatory
-201 or lower	Strongly inflammatory

FOOD	SERVING SIZE	SERVING SIZE (GRAMS)	IF RATING
AGAVE NECTAR	1 TBSP	21	-74
ALMOND BUTTER	¼ CUP	64	100
CHEESE, CHEDDAR	1 OUNCE	28.35	-20
CHICKEN BREAST, RSTD	3 OUNCES	85	-19
MILK, WHOLE	1 CUP	246	-46
OLIVE OIL	1 TBSP	14	74
ONIONS, COOKED	½ CUP	105	240
RICE, WHITE	1 CUP	158	-153
SPINACH	1 CUP	30	75
SALMON, SOHO BAKED	3 OUNCES	85	450
TURMERIC	½ TSP	1.5	338

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Heart Risk Calculator

Age (years)

Gender ☐ Male ☒ Female

Race ☐ African American ☒ Other

Total cholesterol (mg/dL)

HDL cholesterol (mg/dL)

Systolic blood pressure (mmHg)

Diastolic blood pressure (mmHg)

Treated for high blood pressure ☒ No ☐ Yes

Diabetes ☒ No ☐ Yes

Smoker ☒ No ☐ Yes

- Calculate your 10-year risk of heart disease or stroke using the ASCVD algorithm published in 2013.

<http://www.cvriskcalculator.com>

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Heart Risk Calculator

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2.8%

10-year risk of heart disease or stroke

On the basis of your age and calculated risk for heart disease or stroke under 10%, the USPSTF guidelines suggest you would not likely benefit from starting aspirin.

On the basis of your calculated risk for heart disease or stroke less than 7.5%, the ACC/AHA guidelines suggest you have no indication to be on a statin.

Based on your age, your blood pressure is **well-controlled**.

Demography	Cholesterol	Blood pressure	Risk factors
Age: 60	Total: 260	Systolic: 110	Diabetes: no
Gender: female	HDL: 62	Diastolic: 72	Smoking: no
Race: not African-American		On medication: no	

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Statins in Persons at Low Risk of Cardiovascular Disease

In Summary, for those who received statins:

Benefits in Percentage

- 0% statistically significant mortality benefit
- 0.5% avoided a nonfatal heart attack (myocardial infarction)
- 0.3% avoided a nonfatal stroke

Harms in Percentage

- 4.8% experienced pain from muscle damage
- 0.5% developed diabetes mellitus

<http://www.thennnt.com/nnt/statins-persons-low-risk-cardiovascular-disease/>

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Mediterranean Diet for 5 Years for Heart Disease Prevention (Without Known Heart Disease)

In Summary, for those who ate the Mediterranean diet:

Benefits in Percentage

- 98.3% saw no benefit
- 1.7% were helped by avoiding a stroke, heart attack, or death

Harms in Percentage

- 0% were harmed by effects of the diet

<http://www.thennnt.com/nnt/mediterranean-diet-for-heart-disease-prevention-without-known-heart-disease/>

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Heart Risk Calculator

Age (years)

60

Gender

☐ Male
☒ Female

Race

☐ African American
☒ Other

Total cholesterol (mg/dL)

260

HDL cholesterol (mg/dL)

62

Systolic blood pressure (mmHg)

110

Diastolic blood pressure (mmHg)

72

Treated for high blood pressure

☒ No
☐ Yes

Diabetes

☐ No
☒ Yes

Smoker

☒ No
☐ Yes

Calculate

<http://www.cvriskcalculator.com>

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Heart Risk Calculator

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5.3%

10-year risk of heart disease or stroke

On the basis of your age and calculated risk for heart disease or stroke under 10%, the USPSTF guidelines suggest you would not likely benefit from starting aspirin.

On the basis of your age and diabetes, the ACC/AHA guidelines suggest you should be on a **moderate intensity statin**.

Based on your age, your blood pressure is **well-controlled**.

Demography	Cholesterol	Blood pressure	Risk factors
Age: 60	Total: 260	Systolic: 110	Diabetes: yes
Gender: female	HDL: 62	Diastolic: 72	Smoking: no
Race: not African-American		On medication: no	

Moderate intensity statin: examples: atorvastatin 10 mg, pravastatin 40 mg, simvastatin 20-40 mg per day

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Statins Given for 5 Years for Heart Disease Prevention (With Known Heart Disease)

In Summary, for those who took the statin for 5 years:

Benefits in Percentage

- 96% saw no benefit
- 1.2% were helped by being saved from death
- 2.6% were helped by preventing a repeat heart attack
- 0.8% were helped by preventing a stroke

Harms in Percentage

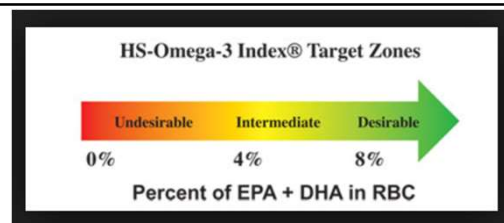
- 2% were harmed by developing diabetes**
- 10% were harmed by muscle damage

*The development of diabetes is one such unanticipated harm found in a recent large study and it seems likely therefore that this applies to the data above, although this is a best guess.

<http://www.thennt.com/nnt/statins-for-heart-disease-prevention-with-known-heart-disease/>

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No Fish Story



- Omega-3 Index **gold standard for omega-3 biostatus** testing. Used as compliance marker for RCTs with fish oil supplements, and in epidemiological research.
- In 2008 Dr. Bernadine Healy said, “Before long, your personal Omega-3 Index just could be the new cholesterol—the number you want to brag about.”
- Canadian government found that **mean Omega-3 Index level of Canadians aged 20-79 was 4.5%.**
- Fewer than 3% of adults had levels associated with low CHD risk; **43% had levels associated with high risk.**

Langlois K, et al. *Health Rep* 2015; Nov 18;26(11):3-11

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American Heart Association

- “**Omega-3 fish oil** supplements prescribed by a healthcare provider *may help prevent death* from **heart disease** in patients who recently had a **heart attack** and may *prevent death and hospitalizations* in patients with **heart failure.**”



Siscovick DS, et al. *Circulation* 2017; Mar 13.

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Choose Your Seafood Wisely

The Seafood Watch App

Available for iOS and Android

It's easier than ever to get the latest recommendations for seafood and sushi, learn more about the seafood you eat, and locate or share businesses that serve sustainable seafood.




[View our App FAQs](#)



Features

- Get free, up-to-date seafood recommendations
- Search for seafood quickly and easily by common market name
- Search for sushi by Japanese name as well as common market name
- Find restaurants and stores near you that serve ocean-friendly seafood
- Access in-depth conservation notes and reports

<https://www.seafoodwatch.org/seafood-recommendations/our-app>

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Vitamin D and Respiratory Infection



Martineau AR, et al. Vitamin D supplementation to prevent acute respiratory tract infections: systematic review and meta-analysis of individual participant data. *BMJ* 2017; 356: i6583.

- Acute respiratory infection kills ~2.65 million people/year.
- **25 eligible randomized controlled trials (n=10,933, aged 0-95 years).**
- Vitamin D supplementation **reduced risk of acute respiratory infection** among all participants and **those who were vitamin D deficient experienced the most benefit (NNT=4).**

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Endocrine Society Guidelines

Serum 25(OH)D level used to determine vitamin D status

- **Sufficiency: 30 ng/mL (75 nmol/L) and above**
- **Insufficiency: 21-29 ng/mL**
- **Deficiency: <20 ng/mL**
 - **66.8 million Americans** 1 year and older had levels between **12-20 ng/ml**
 - **23 million Americans** 1 year and older had levels **less than 12 ng/ml**
- Vitamin D deficient adults should be treated with **50,000 IU of vitamin D2/D3 weekly for 8 weeks** or **6000 IU/d of vitamin D2/D3** to achieve blood level of 25(OH)D *above 30 ng/ml*, followed by ***maintenance therapy of 1500–2000 IU/d***



CDC 2nd National Report on Biochemical Indicators of Diet and Nutrition in the U.S. Population

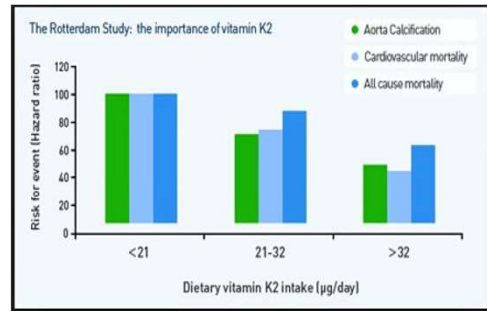
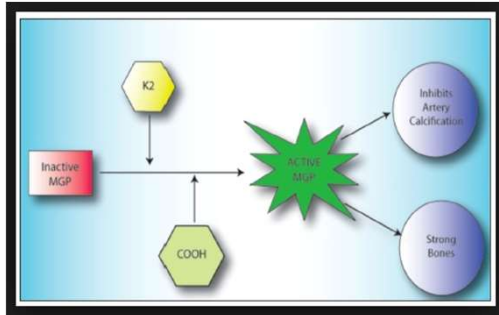
Holick MF, et al. *J Clin Endocrinol Metab* 2011; 96(7):1911-30

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Calcium: Not too Much and Not Alone

- Calcium and vitamin D crucially important for healthy bone, however, vitamin K2 is necessary for ensuring calcium is taken up by bone and not in the kidney or blood vessels. A multivitamin or supplement that contains K1 and/or K2 is important when taking calcium supplements.



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Magnesium

- Low magnesium** intakes/serum levels associated with type 2 diabetes, metabolic syndrome, high blood pressure, atherosclerotic vascular disease, sudden cardiac death, osteoporosis, migraine headache, asthma, colon cancer and inflammation.
- Magnesium** required for activation of vitamin D.
- Medications deplete magnesium (e.g., **diuretics, PPIs, OCPs, gout medication, B2-agonists, steroids**, etc)
- Magnesium supplementation** shown to **improve glucose metabolism and insulin sensitivity** in those with type-2 diabetes.



Rosanoff A, et al. *Nutr Rev* 2010;70(3):153-64
Gommers LM, Hoenderop JG, Bindels RJ, de Baaij JH (2016)
Hypomagnesemia in Type 2 Diabetes: A Vicious Circle? *Diabetes*, 65(1):3-1

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Magnesium and Heart Disease



- 2013 **meta-analysis** of 16 studies with more than **313,000 participants** found:
 - Higher blood levels associated with a **30% lower risk of cardiovascular disease**.
 - Dietary magnesium (per 200-mg/d increment) associated with a **22% lower risk of fatal ischemic heart disease**.
- Magnesium important in maintaining blood pressure and **supplementation (365 to 450 mg/d)** shown to **significantly lower blood pressure** in those with **insulin resistance, prediabetes, and other chronic diseases**.

Del Gobbo LC, et al. Circulating and dietary magnesium and risk of cardiovascular disease: a systematic review and meta-analysis of prospective studies. *Am J Clin Nutr* 2013; 98(1):160-73.

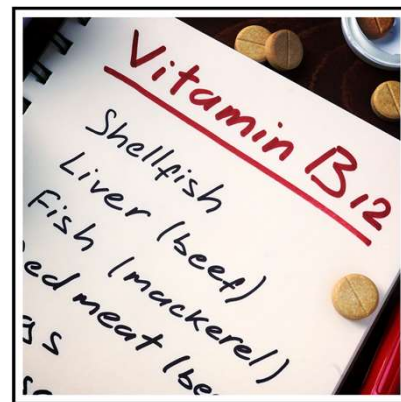
Dibaba DT, et al. The effect of magnesium supplementation on blood pressure in individuals with insulin resistance, prediabetes, or noncommunicable chronic diseases: a meta-analysis of randomized controlled trials. *Am J Clin Nutr* 2017; 106(3):921-929.

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Vitamin B12

- Key role in DNA synthesis, hematopoiesis and neurological function.
- Deficiency: **megaloblastic anemia, neurological disorders (numbness/tingling feet, difficulty walking, memory loss, dementia) tongue soreness, constipation**).
- Risk for deficiency: **inadequate intake, impaired absorption, vegan, meds (metformin, PPIs), obesity, elders, alcoholism**
- **18 million Americans deficient in B12**



Niafar M, et al. *Intern Emerg Med* 2015; 10(1):93-102.

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Review on Turmeric and Boswellia

- Tuft's systematic review 11 RCTs (N = 1009).
- Both curcuminoid and boswellia formulations statistically significantly more effective than placebo for pain relief and functional improvement.
- No significant differences between curcuminoids or boswellia and placebo in safety outcomes.
- Curcuminoids showed no statistically significant differences in efficacy outcomes compared to NSAIDs; patients receiving curcuminoids were significantly less likely to experience gastrointestinal adverse events.
- Results suggest that curcuminoid and boswellia formulations could be a valuable addition to the knee OA treatment regimens by relieving symptoms while reducing safety risks.



Bannuru RR, et al. Efficacy of curcumin and Boswellia for knee osteoarthritis: Systematic review and meta-analysis. *Semin Arthritis Rheum* 2018 Mar 10. pii: S0049-0172(18)30002-7

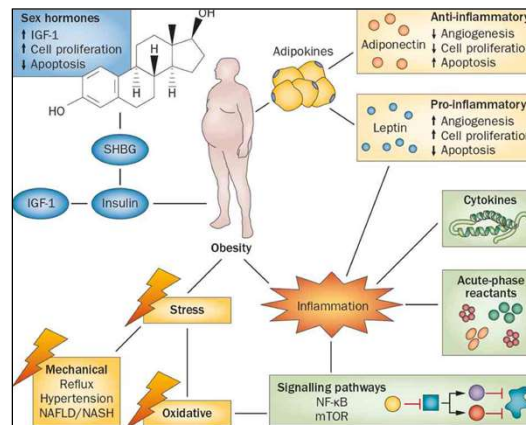
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Turmeric and Leptin

- Leptin (hormone regulating appetite and weight control) is often elevated in obese individuals.
- Meta-analysis showed significant decrease in plasma leptin concentrations following curcumin treatment (standardized mean difference: -0.69, 95% confidence interval: -1.16, -0.23, $p = 0.003$; $I^2 = 76.53\%$).
- No evidence of publication bias.

Atkin SL, et al. Curcuminoids Lower Plasma Leptin Concentrations: A Meta-analysis. *Phytother Res* 2017 Dec;31(12):1836-1841.



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Need for Sleep



- **1 in 3 Americans** do not get sufficient sleep. Research shows chronic sleep problems can lead to **weight gain, obesity, diabetes** (33% increased risk type 2 DM), and **heart disease**.
- **Lack of exposure to sunlight** and use of **bright lights at night** increases the likelihood of disordered circadian clock. Consider **dawn simulation** device/app, use **blue light blocking glasses** at night with technology. Regular sleep hygiene.
- **Controlled release melatonin** now first line therapy for those older than 60 (**2 mg**)

Shan Z, et al. *Diabetes Care* 2015;38(3):529–37

Matheson E, et al. *Insomnia: Pharmacologic Therapy. Am Fam Physician* 2017; Jul 1;96(1):29-35.

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Sleep Evaluation

- There are numerous medications that can impair sleep (**e.g., beta blockers, antidepressants, steroids, ADHD meds, statins, etc.**)
- **Restless leg syndrome** impacts many people. Could be due to **low iron, vitamin D or medications**— though the cause is really not known.
- **Sleep apnea** is a condition where breathing is interrupted during the night. A sleep study can be ordered and treatments are available (e.g., CPAP, dental appliances which reposition lower jaw and tongue)

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Cognitive Behavioral Therapy

- CBT has emerged as a recommended **first-line therapy for insomnia**. Digital CBT has been shown to be effective for improving sleep, as well as mental health and well-being.
- CBT-I typically consists of:
 - Psychoeducation about sleep and insomnia
 - Stimulus control
 - Sleep restriction
 - Sleep hygiene
 - Relaxation training
 - Cognitive therapy



Luik AI, et al. Digital cognitive behavioral therapy for insomnia: a state of the science review. *Curr Sleep Med Rep* 2017; 3(2): 48–56

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Loneliness, Social Isolation & Your Health

- Review found poor social relationships associated with **29% increase in risk of incident CHD and 32% increased risk of stroke**.
- 148 studies on the effects of **social isolation on health** found it is:
 - As bad as **smoking** 15 cigarettes a day.
 - As dangerous as being an **alcoholic**.
 - As harmful as **never exercising**.
 - Twice as dangerous as **being obese**



- Valtorta NK, et al Loneliness and social isolation as risk factors for coronary heart disease and stroke: systematic review and meta-analysis of longitudinal observational studies. *Heart*. 2016 Jul 1;102(13):1009-16.
- Valtorta NK, et al Loneliness, social isolation and risk of cardiovascular disease in the English Longitudinal Study of Ageing. *Eur J Prev Cardiol* 2018 Sep;25(13):1387-1396.
- Cacioppo JT, et al. *Ann N Y Acad Sci* 2011; 1231:17-22

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Meaning and Purpose

- What truly gives a person a sense of *meaning and purpose* in life?
- How can one live from a “*deep place*” despite his or her pain?
- How does one feel the oneness, find the *holy and sacred* in the mundane?

Listen.
Are you
breathing
just a little
and calling
it a life?

~ Mary Oliver

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