Health for Miles: Levers for Improving Top Biomarkers for Drivers

CVSA Workshop – Chicago, Illinois

April 20, 2026

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Overview

1. Why Talk About Health at CVSA?
2. Top Biomarkers
3. Best Levers to Improve Biomarkers
4. Part of a Safety Culture in a FMP
5. nafmp.org Free Resources and Contact

Why Talk About Health at CVSA?

Carriers' and Drivers' Fiduciary Duty

Ensure Viability and Profitability…

…for a Lifetime

Reminders, please

- **Consult your medical provider before following any lifestyle recommendations or if you feel any discomfort**
- You are responsible for any consequences of following any recommendations provided
- Be aware and try to eliminate the stigma associated sometimes with sleeping, metabolic diseases, substance abuse and mental health
- Do not allow any recommendations cause you to worry or become obsessed with a toxic wellness culture

Poll

What Is the Number 1 Cause of Death?

1. COVID-19
2. Suicide
3. Respiratory Diseases
4. Cardiovascular Disease
5. Liver and Kidney Diseases
6. Diabetes Type 1 & 2
7. Cancer
8. Unintentional Injuries

Cardiovascular Disease Deaths

Country	Annual Deaths	Primary Reporting Institution	Report/Data Cycle
United States	**915,973**	**American Heart Association (AHA)**	2026 Heart Disease & Stroke Statistics Update (reporting on 2023–2024 data)
2nd for Canada	**77,635**	**Heart & Stroke Foundation of Canada**	2026 Heart Month Special Report (consolidating StatCan preliminary figures)
Mexico	**224,622**	**Instituto Nacional de Estadística y Geografía (INEGI)**	Estadísticas de Defunciones Registradas (EDR) 2024 (published late 2025)

Metabolic Diseases Burden

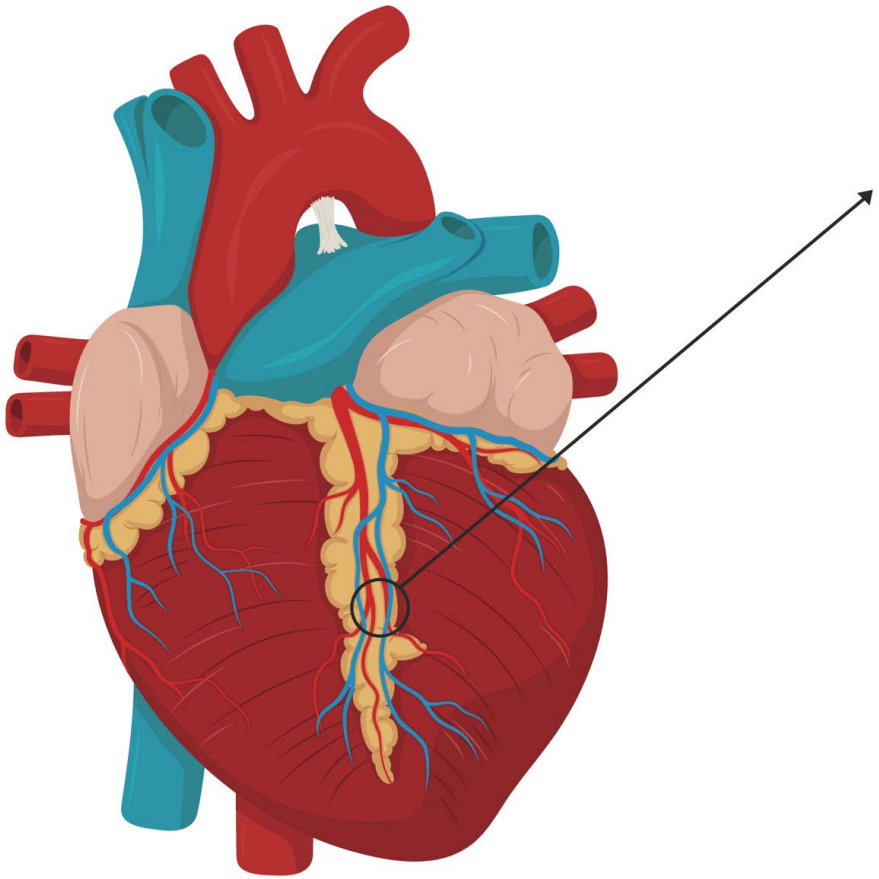
Category	United States	Canada	Mexico
Cardiovascular	915,973 (29.8%)	77,635 (23.8%)	234,426 (28.6%)
Diabetes	95,253 (3.1%)	6,862 (2.1%)	112,295 (13.7%)
Kidney Disease	55,308 (1.8%)	3,921 (1.2%)	27,869 (3.4%)
Liver Disease	52,235 (1.7%)	4,575 (1.4%)	40,984 (5.0%)
Combined Total	1,118,769 (36.4%)	92,993 (28.5%)	415,574 (50.7%)
Total Deaths (All Causes)	3,072,666 (100%)	326,779 (100%)	819,672 (100%)

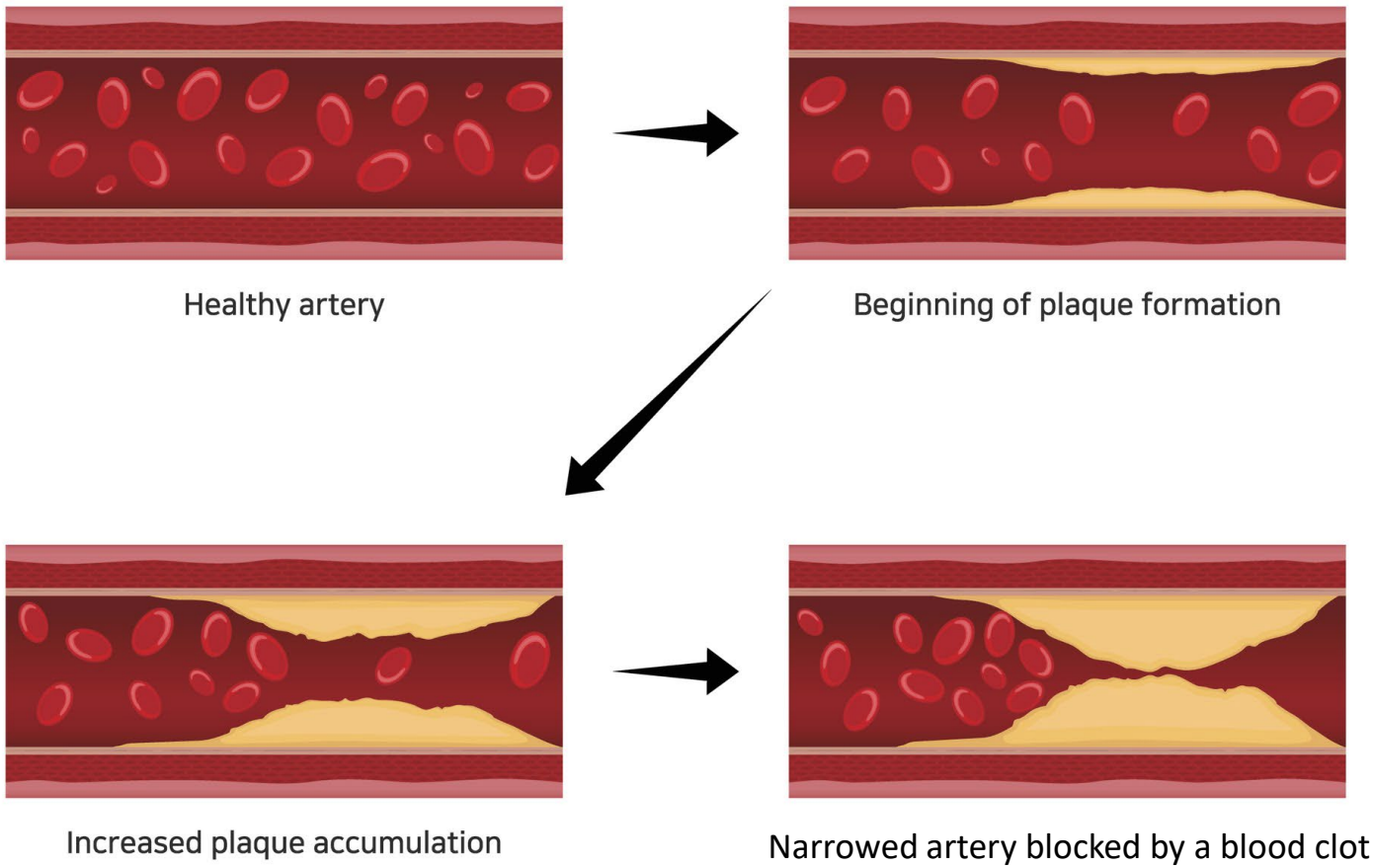
Atherosclerosis

- Damage to the artery wall: It often starts with damage to the inner layer of your arteries by
  - High cholesterol
  - High blood pressure
  - Smoking
  - Diabetes
  - Inflammation
  - Oxidative stress
- Plaque formation: Once the artery wall is damaged, substances like cholesterol, fat, and calcium start to accumulate at the site. This buildup forms plaque
- Narrowing of arteries: As plaque continues to build up, it narrows your arteries, making it harder for blood to flow through

Atherosclerosis Stages

Plaque formation and growth.





Top Biomarkers

Biomarker

- Biological markers are objective, measurable indicators of normal biological processes, pathogenic processes, or pharmacological responses to therapeutic interventions

- They are used to diagnose diseases, predict risks, track treatment response, and personalize medicine

PREVENT™ Online Calculator Biomarkers

Sex*

(•) Male ( ) Female

Age (years)*

30-79

SBP (mmHg)*

90-200

Total Cholesterol (mg/dL)*

130-320

HDL Cholesterol (mg/dL)*

20-100

eGFR (mL/min/1.73m^2)*

15-140

BMI (kg/m^2)*

18.5-39.9

Diabetes

Any history of diabetes.

(•) No ( ) Yes

Current Smoking

Any cigarette use within the last 30 days

(•) No ( ) Yes

Lipid-lowering medication

Current use of statin medication to lower cholesterol

(•) No ( ) Yes

Anti-hypertensive medication

Current use of any medication for hypertension

(•) No ( ) Yes

March 2026 Guidelines

10-YEAR RISK ESTIMATE CROSSWALK

	PCE (2018)	PREVENT-ASCVD (2026)
Low	<5%	<3%
Borderline	5%–<7.5%	3%–<5%
Intermediate	7.5%–<20%	5%–<10%
High	≥20%	≥10%

The Case for Early Intervention

Treat dyslipidemia earlier to reduce lifelong risk of prolonged exposure to atherogenic lipoproteins

Health behavior counseling to support lifestyle optimization should start in youth, with early consideration of pharmacotherapy in youth with familial hypercholesterolemia and in young adulthood in individuals with LDL-C ≥160 mg/dL or a strong family history of premature ASCVD

CPR Model and PREVENT™

- Use the more contemporary American Heart Association Predicting Risk of cardiovascular disease EVENTs (PREVENT™) equations instead of the older Pooled Cohort Equations for 10- and 30-year risk assessment to guide lipid-lowering therapy in primary prevention in adults aged 30 to 79 years

- Use the “CPR” Model: A) Calculate 10-year ASCVD risk; B) Personalize the estimated risk to the specific patient by considering factors not included in PREVENT-ASCVD equations; and C) possibly Reclassify with selective use of coronary artery calcium (CAC) and Reassess treatment recommendations

LDL-Lowering Therapy for Borderline and Intermediate Risk

- LDL-lowering therapy can be considered in adults for primary prevention of ASCVD with a 10-year PREVENT-ASCVD risk estimate of 3% to <5% (borderline risk) and should be considered for those at 5% to <10% (intermediate risk) 10-year risk after a clinician–patient discussion

Return of Targets

- LDL-C and non–HDL-C treatment goals are back to guide lipid-lowering therapy

- Percentage reduction in LDL-C remains a priority for all individuals as well, with reduction goal depending on the level of ASCVD risk

The Role of Apolipoprotein B

- Apolipoprotein B (ApoB) testing can be useful to improve risk assessment and guide therapy once LDL-C and non–HDL-C goals are met, particularly in those with elevated triglycerides (TG) (>200 mg/dL), diabetes, or low achieved LDL-C (<70 mg/dL)
- ApoB measurement helps identify adults with residual elevated lipoprotein-related risk that may be underestimated by the standard lipid profile alone and may be useful in the diagnosis of specific lipid and lipoprotein disorders

Lipoprotein(a) to Identify High-Risk

- Lp(a) should be measured at least once to identify those individuals at higher risk of ASCVD
- It is considered as a risk-enhancing factor at levels ≥125 nmol/L (50 mg/dL), which is associated with about a 1.4-fold increased ASCVD risk, and values ≥250 nmol/L (100 mg/dL) are associated with ≥2-fold higher estimated risk
- The presence of elevated Lp(a) should be an indication for more intensified LDL-C lowering and management of other risk factors

Reclassifying with CAC Scoring

- CAC scoring in men at least 40 years of age and women at least 45 years of age can improve risk assessment and guide LDL-C and non–HDL-C goals
- Both the absolute amount of CAC and the corresponding standardized percentile (currently based on age, sex, and race) have prognostic importance and help to reclassify risk in adults

Special Populations and Older Adults

- LDL-lowering therapy is recommended for primary prevention in adults aged 40 to 75 years with diabetes, chronic kidney disease stage 3 or 4, or human immunodeficiency virus, regardless of LDL-C level

- After age 75 years, LDL-C–lowering pharmacotherapy can be considered in conjunction with lifestyle interventions to reduce ASCVD risk

Aggressive Goals for Secondary Prevention

- In secondary prevention, a goal of LDL-C <55 mg/dL (1.4 mmol/L) and non–HDL-C <85 mg/dL (2.2 mmol/L) is recommended for those at very high risk of ASCVD events

- Although a smaller number of patients with ASCVD not at very high risk have an LDL-C goal of at least <70 mg/dL, the majority of those with a history of ASCVD events will likely qualify for an LDL-C goal of <55 mg/dL

Triglyceride Management

- In patients with persistently elevated TG, statin therapy remains the foundation of pharmacotherapy as an adjunct to lifestyle intervention to reduce ASCVD risk

- Treatment for prevention of pancreatitis may also include TG-lowering therapies, especially in individuals with TG levels ≥1000 mg/dL (11.3 mmol/L)

Lipid Lowering Therapies

Front-Line Oral Therapies

- Statins (e.g., Atorvastatin, Rosuvastatin)
  - Pros: Robust clinical trial data; significant LDL-C reduction (20–50%+); generic and low-cost
  - Cons: Potential for muscle-related side effects (SAMS); slight increase in risk for new-onset diabetes

- Ezetimibe
  - Pros: Excellent safety profile; low side-effect profile; effective as a synergetic add-on
  - Cons: Modest efficacy as monotherapy (approx. 15–20% LDL-C reduction)

Advanced Injectables

- PCSK9 Monoclonal Antibodies (e.g., Evolocumab, Alirocumab)
  - Pros: Potent LDL-C lowering (up to 60%); significant reduction in major cardiovascular events
  - Cons: High cost; requires self-injection every 2–4 weeks; potential for injection-site reactions

- Inclisiran (siRNA)
  - Pros: Infrequent dosing (twice yearly); high adherence rates due to healthcare-provider administration
  - Cons: Newer therapy with less long-term outcomes data than statins; high cost/insurance hurdles

Targeted & Alternative Pathways

- Bempedoic Acid (ACL Inhibitor)
  - Pros: Liver-specific activation (avoids muscle side effects); good alternative for "statin-intolerant" patients
  - Cons: Modest LDL-C reduction (15–18%); may increase uric acid levels (gout risk) or tendon rupture risk

- Icosapent Ethyl (EPA)
  - Pros: Effectively lowers triglycerides; demonstrated reduction in CV risk in high-risk patients
  - Cons: Does not lower LDL-C (may slightly raise it); increased risk of atrial fibrillation and minor bleeding

Lifestyle Levers to Improve Biomarkers

Quit Smoking

Smoking & Tobacco Use

- Leading preventable cause of disease, death, and disability
- ~20% of Americans smoke, but nearly **half** of CMV drivers do
- Causes lung cancer, COPD and other lung diseases, heart disease, and many other medical conditions
- >$1,000 per year in medical costs for each smoker
- Reduces oxygen flow to the brain; worsens OSA
- Strategy: ***QUIT!!!***
  - See your doctor
  - Call 1-800-QUIT-NOW
  - Click www.smokefree.gov or
  - Click www.hc-sc.gc.ca

How Smoking Damages Health

- Smoking triggers a massive inflammatory response. This causes the lining of the arteries (the endothelium) to become sticky, allowing plaque to build up much faster
- Carbon Monoxide binds to your hemoglobin more effectively than oxygen does. This essentially suffocates your tissues and heart muscle, forcing your heart to work harder to deliver less oxygen
- Combusted tobacco contains over thousands of chemicals, at least 70 of which are known to cause cancer by damaging DNA and preventing cells from repairing that damage

Potent Sympathomimetic Drug

- Nicotine causes an immediate increase in heart rate and blood pressure. It constricts the blood vessels (vasoconstriction), which makes the heart pump against higher resistance
- Nicotine interferes with insulin sensitivity. It can raise blood glucose levels and promote abdominal fat storage, which complicates the management of metabolic health and increases the risk of Type 2 diabetes
- Nicotine is highly addictive because it triggers dopamine release in the brain's reward circuitry. Over time, the brain rewires itself, leading to increased anxiety or irritability when not using it
- Disruption of sleep architecture (reducing the quality of deep sleep)
- Even without smoke, nicotine alone can impair the ability of blood vessels to dilate properly. This contributes to the long-term stiffening of the arteries, a key driver of ASCVD

Poll

What is the single most important predictor of wellbeing and longevity?

1. Low cholesterol
2. Not smoking
3. Warm relationships
4. Exercising
5. Meditation
6. VO2 max
7. Normal blood pressure

Warm Relationships

Surprising Truth

- Strong social ties increase survival odds by 50%
- Relationship quality is as vital as quitting smoking
- Isolation is a risk multiplier for CMV drivers
- Good connections help regulate stress and cortisol
- Prevent inflammation from chronic stress

Positive Relationships and Health

- Individuals with strong social connections and supportive relationships tend to have lower risks of developing chronic diseases
- Strong social connections are associated with lower rates of depression, anxiety, and other mental health disorders
- Studies have consistently shown that individuals with strong social ties tend to live longer lives
- Supportive social connections and positive emotional experiences can enhance immune responses, leading to better resistance against infections and faster recovery from illnesses
- When individuals have supportive and encouraging relationships, they are more likely to engage in healthy habits and make positive lifestyle choices

Positive Relationships and Alertness

- When individuals feel valued, supported, and understood in their relationships, they are more likely to experience positive mental states and have a better ability to focus, concentrate, and stay mentally alert

- Strong social connections can also provide a sense of purpose and motivation, which can enhance overall alertness and engagement in various aspects of life

Poll

What is a positive relationship?

a) One characterized by mutual respect, trust, support, and cooperation
b) Where both parties feel valued, understood, and appreciated
c) Individuals communicate effectively, listen attentively to each other's needs and concerns
d) Individuals strive to find common ground and resolve conflicts in a constructive manner
e) All of the above
f) None of the above

What drivers can do to nurture positive relationships (1 of 2)

- Spend dedicated time with your relationships
- Be optimistic and grateful
- Keep stress in check practicing the other four keys to wellness
- Be open, honest and respectful
- Attack the problem, not the person
- Try not to jump to conclusions
- Make your relationships a priority

What drivers can do to nurture positive relationships (2 of 2)

- Make contact every day
- Underpromise and overdeliver
- Don't stop talking when something needs to be said
- Don't speak when someone else needs to be heard
- Appreciate your colleagues, family, and friends for who they are
- Treat relationships as a place where you go to give, not to take
- It’s a process; work on it every day

What motor carriers can do to nurture positive relationships (1 of 2)

- Effective communication
- Fair compensation and benefits
- Give them time off
- Offer training and development opportunities
- Provide a safe work environment
- Improve driver experience with technology

What motor carriers can do to nurture positive relationships (2 of 2)

- Don’t create impossible situations
- Give and take feedback
- Celebrate successes
- Offer them opportunities for advancement
- Praise them in front of their peers
- Thank them personally

Poll

What is the single second most important predictor of wellbeing and longevity?

1. Low cholesterol
2. Not smoking
3. Warm relationships
4. Exercising
5. Meditation
6. VO2 max
7. Normal blood pressure

Cardiopulmonary Fitness

VO2 max: Survival Metric

- It measures the max oxygen your body can use
- Stronger predictor of mortality than smoking or diabetes
- It determines your healthspan or years in good health

2026 Q1 Guardian

The Second Single Most Important Predictor of Wellness and Longevity

*By **Rodolfo Glacoman**, Fatigue Management Specialist, Commercial Vehicle Safety Alliance*

If you have seen my presentations, chances are you heard me say that the single most important predictor of well-being and longevity is positive personal relationships. I was surprised to learn how our social interactions have such an overwhelming impact on our physical health. The underlying reason is that warm relationships are a powerful stress regulator. If you are interested in the scientific evidence validating it, please see the previous two pages and check out the fourth quarter 2023 "Guardian" article, "The Alertness Equation: How Positive Relationships Add Up."

So, based on that, should we just concentrate on positive relationships and forget about mindfulness, exercise, nutrition and sleep hygiene? Should we just party with others, including drinking alcohol and smoking? Don't I wish.

Wellness and longevity, just like fatigue, are multifactorial. And while maintaining positive relationships may be the most important factor, it is not the only one. The second single most important predictor of wellness and longevity is cardiorespiratory fitness measured by the "VO2 max rate." VO2 max is the maximum volume of oxygen our body can utilize during intense or maximal exercise. It measures how many milliliters (Volume) of oxygen (O2) our body can process per minute.

Solid Predictor of Longevity

Large-scale studies, including a landmark 2018 study published in JAMA Network Open involving over 120,000 participants, found that cardiorespiratory fitness, measured by VO2 max, is a stronger predictor of death than traditional risk factors like smoking, diabetes or high blood pressure.

The data suggests that the higher our VO2 max, the lower our risk of premature death. Most notably, there appears to be no ceiling to this benefit as extreme fitness is associated with the lowest risk of mortality.

Healthspan vs. Lifespan

While VO2 max predicts how long we will live (lifespan), it is even more critical for healthspan, the period of life spent in good health. VO2 max naturally declines with age, roughly 10% per decade after age 30. By starting with a higher peak, we ensure that even after decades of decline, we remain above the threshold of frailty.

High aerobic fitness is linked to better insulin sensitivity and mitochondrial function, significantly lowering the risk of Type 2 diabetes and metabolic syndrome, a group of conditions that increase the risk of heart disease, stroke and Type 2 diabetes. The evidence shows that improving VO2 max provides a protective effect across multiple systems.

It reduces arterial stiffness and strengthens the heart muscle, thereby lowering the risk of stroke and heart attack. Higher fitness levels are correlated with a lower risk of dementia and Alzheimer's disease, likely due to increased blood flow and oxygen delivery to the brain. Higher VO2 max levels are associated with lower rates of certain cancers, particularly lung and colorectal cancers.

For drivers, VO2 max acts as a physiological buffer. A high VO2 max means that the cost of daily life (walking, lifting, staying alert) represents a smaller percentage of total capacity. This results in less systemic stress, lower cortisol levels and better recovery from the physical demands of the driving task.

What It Actually Measures

VO2 max measures the efficiency of our entire oxygen supply chain, from the moment we take a breath to the moment that oxygen is converted into energy in our muscles.

The Oxygen Supply Chain System

Here are the five stages of the oxygen supply chain system from a logistics perspective:

Supply Chain Stage	Biological Component	Logistical Process	Potential Bottleneck
Port of Entry	Lungs, Pulmonary Ventilation	Oxygen is offloaded from the atmosphere into the bloodstream via the alveoli	Limited air exchange or restricted dock surface area
Loading Cranes	Heart, Cardiac Output and Stroke Volume	The heart generates the lifting power to push the oxygen-filled blood into the transport network	Small stroke volume, the crane moves less volume per cycle, and not fast enough crane or heart rate
Delivery Fleet	Blood, Hemoglobin and Red Blood Cells	The trucking fleet that physically holds the oxygen containers and moves them through the system	Low red blood cell count, fewer trucks available to be loaded
Local Infrastructure	Capillaries, Micro-circulation	The last-mile delivery streets that branch off the main highway to reach individual muscle cells	Low capillary density, lack of off-ramps to get trucks to the factories
Factory	Muscles, Mitochondria	The end user that consumes oxygen containers to manufacture the final product, ATP or cell energy	Low mitochondrial density, fewer production lines to process the supply

When measuring VO2 max, we are measuring the total capacity of this system to move oxygen from the port of entry all the way to the factory at peak demand. If any single stage of this supply chain reaches its limit, the VO2 max rate will plateau.

Methods to Measure or Calculate VO2 Max

Laboratory vs. Clinical Standards
The Metabolic Cart and Bruce Protocol are the most rigorous. While the Metabolic Cart measures actual gas exchange, the Bruce Protocol uses a specific treadmill formula. These are excellent for drivers who need a definitive medical-grade baseline for their health records or U.S. Department of Transportation (DOT) exam readiness. *(See Important Safety Notice.)*

Performance-Based Estimates
The Cooper 12-Minute Run and Beep Test use high-intensity performance to work backward and predict oxygen use. These are great for drivers who are already active and want a benchmark of their engine's maximum power without needing a lab. *(See Important Safety Notice.)*

Low-Impact and Accessible Methods
The Rockport Walk and Step Test are the most practical for life on the road. They provide a solid estimate of your cardiovascular health without requiring you to run at full speed, making them safer to perform at a truck stop. *(See Important Safety Notice.)*

Data-Driven and Stationary Calculations
The CERG Calculator is a research-based desktop method. It requires zero physical exertion, using population data to estimate your fitness based on your age, BMI, resting heart rate and exercise habits.

The Heart Rate Ratio is the most convenient calculation of all. By simply knowing resting and maximum heart rates, we can get a quick ballpark figure of the heart's efficiency anywhere.

Continuous Monitoring
Wearables (watches, rings, etc.) calculate the trend of your supply chain efficiency over months. For a driver, seeing this score improve over the long haul is a great sign that the cardiovascular system is becoming more resilient.

How to Improve VO2 Max

To upgrade your oxygen supply chain, you need a two-pronged approach: Building a massive infrastructure (Zone 2 training) and upgrading your loading cranes (high-intensity interval training (HIIT)). *(See Important Safety Notice.)*

Building Infrastructure: Zone 2 Training
Zone 2 is low-intensity, steady-state cardio exercise where one can hold a conversation uncomfortably without gasping for air. For drivers, this is the most sustainable way to train. The goal is to build more local infrastructure, or capillaries, and more factories, or mitochondria. Zone 2 training makes our bodies better at burning fat for fuel. This keeps our energy levels stable during a long day shift and prevents energy crashes that lead to fatigue.

Drivers should start with 30-45 minutes and increase it gradually, three to four times a week. Heart rate should stay at roughly 60-70% of maximum or when it is still possible to speak entire sentences, but uncomfortably.

Upgrading Loading Cranes: HIIT Training
HIIT involves short bursts of maximum effort followed by recovery. The goal is to upgrade the loading cranes or heart. HIIT forces the heart to pump the maximum amount of blood possible per beat, which physically stretches and strengthens the heart chambers, increasing stroke volume. This raises the ceiling. It makes physical tasks – like tarping a load or cranking a landing gear – feel significantly easier because your heart is now over-indexed for the task.

Drivers should start with 2-4 minutes of hard effort, followed by 1-3 minutes of easy movement. Repeat this at least four times. Doing this once or twice a week will result in observable gains in VO2 max.

Efficiency Barrier: The Lactate Threshold
While VO2 max is the total horsepower, the lactate threshold determines how much of that power can be used for a long time. Lactate is a byproduct of energy production. At lower intensities, the body clears it as fast as it makes it. But as we push harder, we hit a point where lactate builds up in the blood faster than we can remove it, and this is the Lactate Threshold.

If our threshold is low, we will feel burned out and physically exhausted very quickly. By doing both Zone 2 and HIIT, we push our threshold higher. This allows us to work at a higher percentage of VO2 max without redlining the system.

Continued on next page

IMPORTANT SAFETY NOTICE

The information provided here is for educational and informational purposes only and is not intended as medical advice. VO2 max testing, especially high-intensity protocols like the direct lab test, Bruce Protocol, Cooper Run or Beep Test, places significant stress on the cardiovascular and respiratory systems.

Before attempting any VO2 max test, starting a new exercise program or changing your physical activity level, you must consult with a qualified healthcare professional (such as a doctor, cardiologist or U.S. DOT medical examiner). This is especially critical if you:

- ⚠ Have a history of heart disease, high blood pressure or respiratory issues
- ⚠ Are managing chronic conditions like diabetes or obesity
- ⚠ Experience chest pain, dizziness or shortness of breath at rest or during activity
- ⚠ Have been sedentary for a long period

Stop exercising immediately and seek medical attention if you feel any discomfort, unusual pain, lightheadedness, nausea or extreme fatigue during a test or workout. Your safety and long-term health are more important than any fitness score.

Oxygen Supply Chain

1. Port of Entry: Lungs, Pulmonary Ventilation
2. Loading Cranes: Heart, Cardiac Output and Stroke, Volume
3. Delivery Fleet: Blood, Hemoglobin and Red Blood Cells
4. Local Infrastructure: Capillaries, Micro-circulation
5. Factory: Muscles, Mitochondria

Why Fitness Matters to Drivers

- High VO2 max buffers against daily driving stress
- Lowers cortisol and speeds up recovery from shifts
- Prevents energy crashes by burning fat for fuel
- Significantly lowers the risk of dementia

Methods to Measure or Calculate VO2 Max

**See Important Safety Notice*

Specific Test*	Method Category	How It Works	Accuracy
Metabolic Cart, CPET	Direct Lab	Direct measurement of oxygen inhaled vs. carbon dioxide exhaled using a breathing mask while exercising to exhaustion	Gold Standard
Bruce Protocol	Clinical Stress	A treadmill test where speed and incline increase every three minutes; uses time lasted to calculate the rate	High
Cooper 12-Min. Run	Performance	Run as far as possible in 12 minutes; distance is plugged into a standardized formula	High
Beep Test, Shuttle Run	Performance	20m shuttles at increasing speeds; your final level determines the estimated rate	High
Rockport 1-Mile Walk	Submaximal	A brisk 1-mile walk; uses finish time and heart rate to predict oxygen capacity	Moderate
Queens College Step Test	Submaximal	Stepping up and down on a 16-inch bench for three minutes, then measuring recovery heart rate	Moderate
Watch or Ring, etc.	Wearable Tech	Uses GPS pace and heart rate data during outdoor movement to model your capacity	Variable
CERG Website Calculator	Research Model	An online tool from NTNU using age, BMI, resting HR and exercise habits	Predictive
Heart Rate Ratio	Resting Estimate	A simple formula: (15.3 x Max Heart Rate) / Resting Heart Rate	Low

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  - Have been sedentary for a long period
- Stop exercising immediately and seek medical attention if you feel any discomfort, unusual pain, lightheadedness, nausea, or extreme fatigue during a test or workout. Your safety and long-term health are more important than any fitness score

Upgrading Your Oxygen Supply Chain

- Zone 2 (Infrastructure)
  - 30–45 mins of medium intensity cardio
- HIIT (Cranes)
  - Short bursts of max (or close to max) effort

Poll

Is pain a normal part of making progress in exercise?

- True
- False

Three Types of Exercise

1. Cardio: Improves heart/lung fitness

2. Resistance: Prevents muscle loss (Sarcopenia)

3. Stretching: Maintains flexibility and range of motion
   - Note: Never stretch where it hurts; nerves dislike it

Protecting the Chasis

- The Neck and Low Back are most vulnerable to injury
- Strong Abs and Glutes protect the lumbar spine
- Strong muscles act as a brace for the spine

Timing and Fueling

- The best time to work out is when you will do it
- Avoid intense exercise 3-4 hours before bedtime
- Hydrate with water; avoid sports drinks/sugars
- Eat real food; shakes are highly processed substitutes

Poll

Which is the best exercise routine?

The Best Routine

- The best routine is the one you actually do
- Schedule workouts as non-negotiable calendar items
- Track your progress to keep motivated
- Remember: Your body is your most important asset

Exercise Best Practices

- Breathe; blow your nose before & after
- Maintain Spine Alignment
- Hydrate All Day
- Warm-Up Before
- Stretch Afterwards
- Recovery Day(s)
- Muscle Sore vs Discomfort/Pain/Injury
- Quality (Proper Form) vs Quantity (Overdoing it)

Sample Warm-Up

- Squat and hug
- Arms up and calf raise
- Little squat and raise/cross arm
- Arm circles with knee raises
- Any light cardio
- Any mimicking resistance

Sample Cardiovascular Exercises

- March with high knees
  - Add cross jab, upper cut, hook
- Run
  - Slow
  - Fast
  - High knees
  - Kick back
- Walk sides with arm raises
- Jumping Jacks

Sample Resistance Exercises

- Squat
  - Add lunges
    - Forward
    - Side
    - Back
    - Hold each side for faster failure
- Push-up
  - Modified
- Burpee
  - Squat + Plank + Push-up + Jump + Clap at the top
- Hip raise/hold
  - Legs extended
  - Raise from heels and shoulders

Sample Stretching

- Forward bow to decompress spine
- Sit on legs feet flat, massage sole of feet with hand knuckles
- Sit on toes with arm stretch & deep breathing
- Low lunge stretch
- Pigeon stretch
- Plank rotating sides
- Downward dog with back kick
- Half tortoise stretch
- Standing Separate leg stretch

Balancing Exercises

- Cross legged squat
- One leg slow run stretch
- Quad/shoulders/back stretch
- Standing head to knee

Rodolfo's Minimalist Routine

- Front inversion
  - Activate glutes
  - Activate lower abs
  - Add shoulder shrug
- Max push ups (any option)
- Cross legged squat
- Plank with leg raise and knee to elbow

Mindfulness

Poll

- What is Mindfulness? Please select any that apply:
  - Intentionally paying attention to the present moment
  - Overall emotional, psychological, and social well-being
  - Opening ourselves to reality without judgment
  - Specialized treatment from a professional
  - Tool for managing stress, reducing anxiety and improving overall well-being
  - All of the above
  - None of the above

Mindfulness vs Mental Health

- Mindfulness
  - Intentionally paying attention to the present moment
  - Opening ourselves to reality without judgment
  - A tool for managing stress, reducing anxiety and improving overall well-being
  - Practice include meditation, breathing exercises, and body awareness
- Mental health
  - Overall emotional, psychological, and social well-being
  - Specialized treatment from a professional
  - Range of conditions that affect how a person thinks, feels, and behaves
  - Influenced by a variety of factors, including genetics, environment, and life experiences

Mindfulness: Not a Substitute for Mental Health

- Mental health disorders can be complex and require specialized treatment from a mental health professional

- Mindfulness practices can be integrated into a comprehensive mental health treatment plan, but they should not be relied on as the sole treatment for a mental health condition

Mental Health Resources

- Several private health insurance providers offer **Employee Assistance Programs** (EAPs), which provide confidential counseling and other resources to employees and their families

- The **Substance Abuse and Mental Health Services Administration** (SAMHSA) provides resources and information on mental health and substance abuse treatment. SAMHSA's National Helpline can be reached at 1-800-662-HELP (4357). It's a free, confidential, 24/7, 365-day-a-year treatment referral and information service (in English and Spanish) for individuals and families facing mental and/or substance use disorders

- The **National Suicide Prevention Lifeline** provides free, confidential support 24/7 to anyone in distress (in English and Spanish). The Lifeline can be reached at **988**

- **Mental Health America** provides a range of resources and information on mental health, including screening tools, self-help resources, and support groups. Anyone can access these resources through the MHA website or by calling its toll-free number at 1-800-969-6642

Benefits of Mindfulness

- Increased self-awareness
- Reduced stress and anxiety
- Improved cognitive function
- Enhanced physical health, concentration & focus
- Better sleep quality
- Improved well-being and resilience

Improved Sleep Quality

- Several studies have found that mindfulness-based interventions, which often include meditation practices, can improve sleep quality in individuals with sleep disturbances or insomnia
- A meta-analysis of 18 studies concluded that mindfulness-based interventions have a small-to-moderate effect on improving sleep quality across various populations
- Mindfulness practices may help regulate the sleep-wake cycle, reduce rumination and intrusive thoughts, and promote relaxation, leading to improved sleep

Reduced Fatigue

- Mindfulness interventions have been found to reduce fatigue and increase energy levels in various populations, including individuals with chronic fatigue syndrome, cancer patients, and healthcare professionals
- Mindfulness training can enhance self-regulation, reduce stress and burnout, and promote psychological well-being, which may contribute to decreased fatigue

Meditation

- Principal instrument for strengthening our capacity for mindfulness
- Exercises that can be used to enlarge and refine mindfulness
- Specific ways to train our awareness
- Attention & focus
- Relaxation & calm
- Self-reflection & insight
- Different kinds of meditation – sitting and moving, guided and unguided, and more

How To Get Started?

- Meditation can be done at any time, in any location, and whether sitting, laying, or moving. You can even meditate while driving
- Start off with just one minute at a time
- Clear your mind
- Close your eyes and focus on breathing
- Allow your thoughts to move through you. Acknowledge them, and let them float on by
- Try not to get stuck on any one thought
- Start off with a few times per week and increase time and frequency

Meditation Recommendations

- Be comfortable
- Stay alert
- Environment quiet and free of distractions
- Body in proper position
- Eyes open or closed
- Start with deep breaths then go on with natural breathing

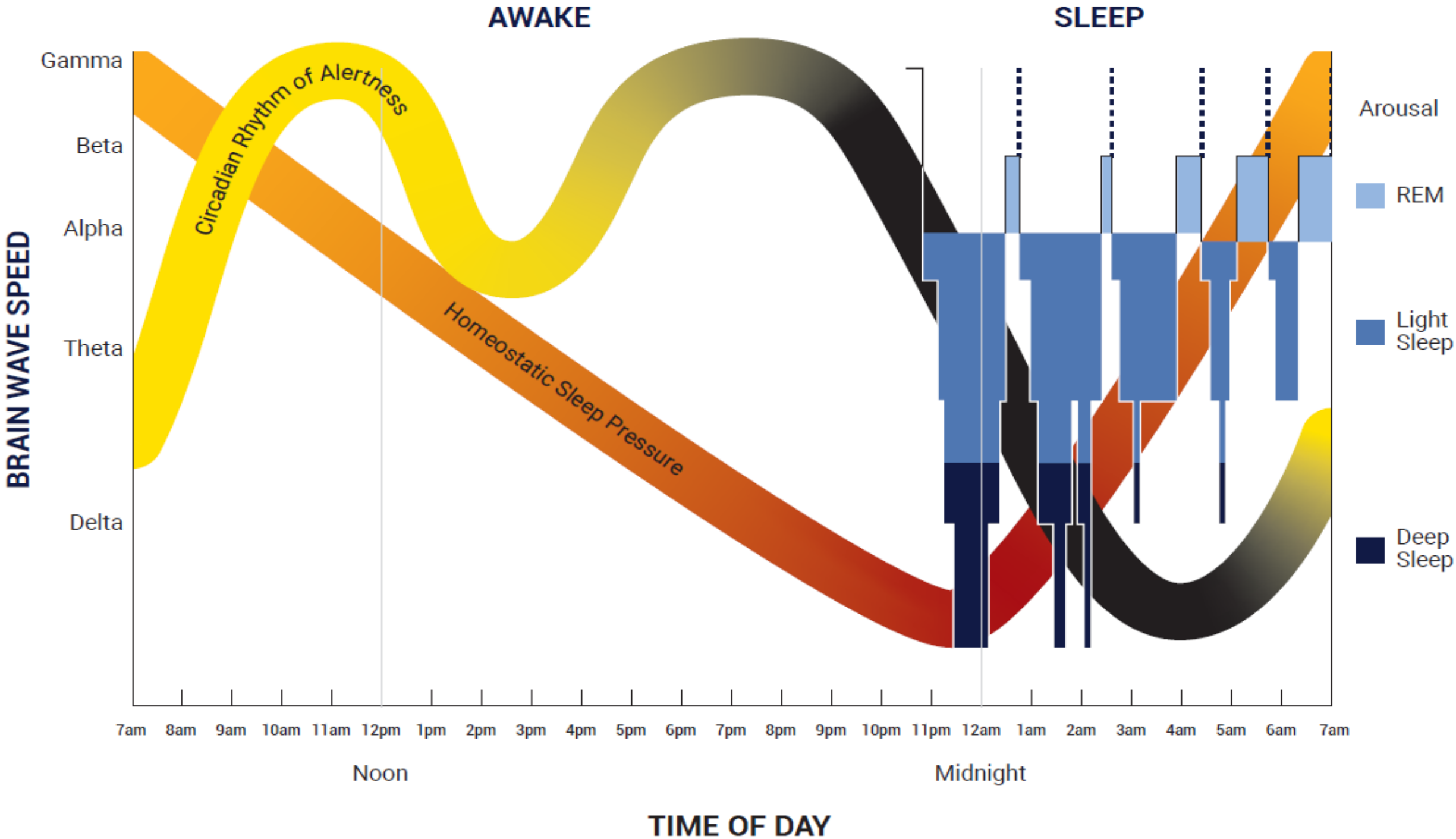
Breathing Meditation Practice

Poll

What will kill you faster?

- No Sleep
- No breathing
- Starvation
- Dehydration

Sleep Hygiene


AWAKE
SLEEP
Gamma
Beta
Alpha
Theta
Delta
BRAIN WAVE SPEED
Circadian Rhythm of Alertness
Homeostatic Sleep Pressure
Arousal
REM
Light Sleep
Deep Sleep
7am 8am 9am 10am 11am 12pm 1pm 2pm 3pm 4pm 5pm 6pm 7pm 8pm 9pm 10pm 11pm 12am 1am 2am 3am 4am 5am 6am 7am
Noon
Midnight
TIME OF DAY

Energy Stimulation Hygiene

- Light
- Temperature
- Sound
- Substances
  - Food
  - Caffeine
  - Alcohol
  - Nicotine
  - Amphetamines
  - Medications

Energy Release Hygiene

- Exercise
  - Early: Cardio & Strength
  - Anytime: Stretching & Breathing (Blow your nose & sleep position)
- Make bed the sleep trigger
  - Spine alignment
    - Supportive bed & pillows
- If cannot sleep and are anxious
  - Get up
  - Don’t throw a party
  - Do something relaxing
- Relax
  - Land worries on paper
  - Meditate, practice yoga, pray or read something calming
  - Intimacy

Poll

What is the optimal duration of a nap?

- 5 min
- 20 min
- 60 min
- 90 min
- 120 min

Naps & Sleep Inertia

- Naps
  - Best fatigue countermeasure
  - Improves alertness & performance
  - Planned naps reduced subsequent dozing by 50% & errors by 34%
  - Optimal duration 20 min / 90 min
  - Longer naps may delay onset of next main sleep
- Sleep inertia
  - Grogginess upon awakening
  - May last 20 minutes or more
  - May affect driving
  - Caffeine may help

How to Payback a Sleep Debt?

- Sleep debt
- Full night sleep
- May require several nights of full sleep
- Avoid deprivation
- Sleep until you wake up
- Make extra deposits on the weekend

Nutrition

Poll

The purpose of diets is to lose weight

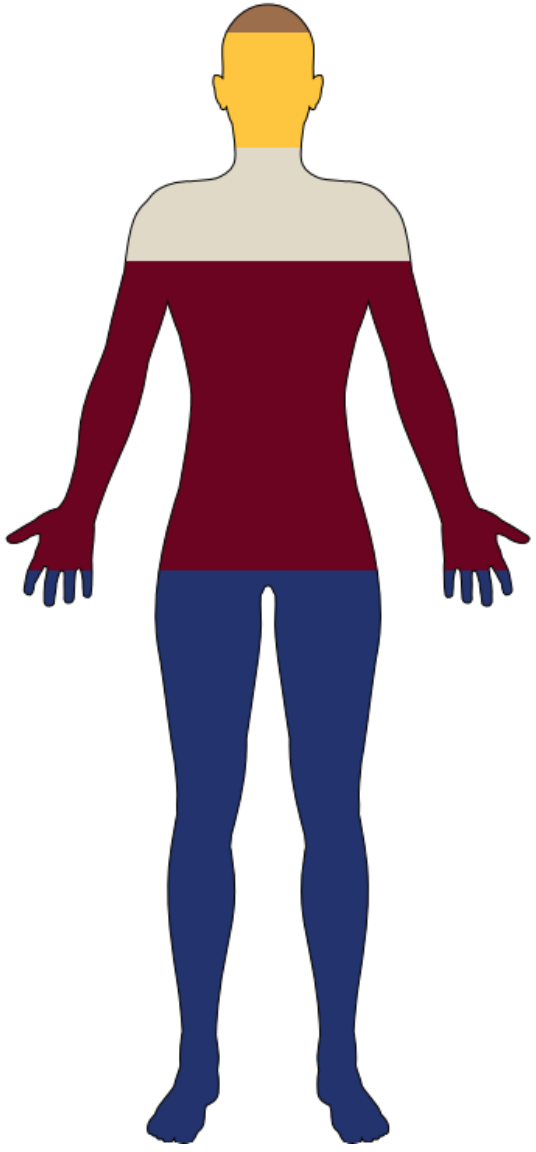
- True
- False

Poll

Rank where body weight comes from. Heaviest first, lightest last

- Visceral Fat
- Muscles
- Subcutaneous Fat
- Bones
- Liquids

What Makes Up Body Weight?



- LIQUIDS
- MUSCLE
- BONES
- SUBCUTANEOUS FAT
- VISCERAL FAT

Weight loss is the wrong goal

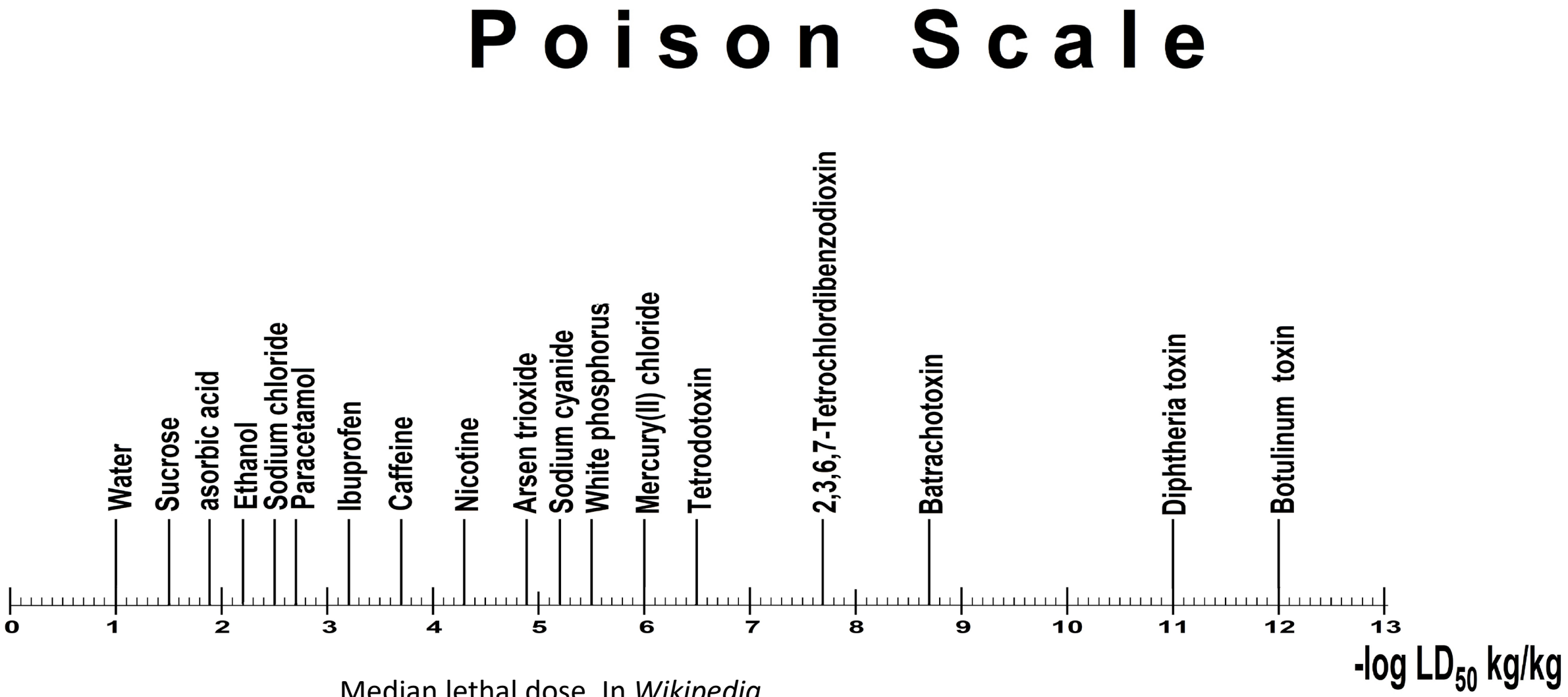
- Weight loss is regained in 1-5 years
- May lack essential nutrients and may be harmful
- May take pleasure out of eating
- May lead to eating disorders
- Snake oil is medical quackery
- Goal is to stay healthy, enjoy food and share it with others

Poll

What is a superfood?

a) Food that helps promote health by increasing your immune function and decreasing your chance of disease progression
b) Just a marketing ploy
c) Food that you can solely depend on for all your nutritional needs

Lethal Dose



Median lethal dose. In *Wikipedia*. https://en.wikipedia.org/wiki/Median_lethal_dose

Nutrition

- Essential Macronutrients
  - Carbs with Fiber (veggies, fruits, legumes, whole grains)
  - Fats except artificial trans fats (fatty fish, nuts, seeds, avocado, milk products)
  - Proteins (fish, seafood, chicken, beef, pork, tofu, milk products)
  - Water
- Essential Micronutrients
  - Vitamins (water-soluble and fat-soluble)
  - Minerals (macro and trace minerals)
- Nutritious food
  - No ingredients list
  - No nutrition label
  - No health claims

Malnutrition

- Ultra processed food
  - Lack of fiber
  - Excess sugar, salt, oils, fats and other additives
  - Engineered to taste good
  - Cheap & convenient
  - Aggressively marketed
  - Addictive
- Liquid candy
  - Soda
  - Juice
  - Any caloric drink

- Toxic to the liver and brain
  - Excess sweeteners
  - Artificial trans fats
  - Excess protein
  - Alcohol and drugs

Poll

How much should I eat?

- Once a day
- Three times a day
- Until satisfied
- Five times a day
- Fast for 16 hours then eat whatever within 8 hours
- 5:2 Fasting protocol

General Recommendations

- Eat until satisfied; wait 20 minutes for seconds
- Really chew your food, don't swallow it. Breathe
- Eat when you have the appetite for it – Listen to your body
- Give your liver a break – It's okay to skip a meal
- Try not to eat shortly before going to bed
- Decline to eat a dessert-based diet – Try to eat most nutrients
- Plan your meals for the week – Your liver and wallet will thank you
- Most importantly: Do not stress or obsess about food

10 Types of Snacks for the Road

1. Unsweetened drinks: Water, sparkling water with lime/lemon, coffee, tea, herbal infusions
2. Any seeds: Pumpkin, sunflower, cacao nibs, flax, chia, hemp
3. Any nuts: Almonds, walnuts, pecans, cashews, pistachios
4. Any veggies: Romaine hearts, celery, carrots, cucumber, cherry tomatoes, bell peppers
5. Any fruits: Berries, apples, oranges, clementines, bananas, plums, pears, pineapple
6. Spreads: Guacamole, hummus, plain yogurt/Greek, plain nut butters, cheese, pesto
7. Not so smooth smoothies (keep the fiber): Made with any of those above
8. Any protein: Boiled eggs, rotisserie chicken, ribs, lamb/steak skewers, sashimi, fish fillet
9. Beans: Pinto, black, kidney, edamame, chickpeas
10. Minimally processed cereals: Steel cut oatmeal, barley, bulgur, brown rice, plain popcorn

Sample Malnutrition Foods

- Most protein bars
- Candy
- Cake & cookies
- Ice cream
- Soda
- Chips
- Most commercially prepared breads
- Boxed cereals
- Alcohol

What sides should I have at restaurants?

- Any vegetable, fresh or cooked
- Any fresh fruit
- Any whole grains

What sides should I avoid?

- Hash browns
- French fries (or anything deep fried)
- Potato dishes
- Gravy or starchy sauces
- Macaroni and cheese
- Any other starches

Poll

Should I count my food calories?

- Yes
- No

What Is in the Food Matters More

- A 20-ounce cola soda
  - 240 calories
  - 65 grams of carbs
  - Minerals: sodium, calcium, potassium and phosphorus

- Three eggs
  - 240 calories
  - 15 grams of fat, 1.8 grams of carbs and 19 grams of protein
  - Minerals: sodium, calcium, choline, iron, phosphorous, selenium, iodine, zinc, magnesium, copper, manganese, potassium
  - All vitamins except vitamin C: A, D, E, K, B1, B2, B3, B5, B6, B7, B9 and B12, which may represent up to 45% of our daily vitamin requirements

Poll

Freshly squeezed juice has less sugar than soda

- True
- False

You Be the Judge

- A 20-ounce of freshly squeezed orange juice made with six oranges has 360 calories and the equivalent of 24 teaspoons of table sugar

- A 20-ounce cola soda has 240 calories and the equivalent of 16 teaspoons of table sugar

Poll

I’m fat because of my lack of discipline

- True
- False

Obesity is Complex and Multifactorial

- Age
- Genetic predisposition (family history)
- Environmental factors
- Psychological and psychiatric factors

Poll

There is only one healthy diet

- True
- False

We Are Omnivores

- It is possible to get optimal nutrition with a strict herbivore or a strict carnivore diet, but it is more difficult

- Many types of diets may have good medical, environmental and personal justifications for different individuals

Poll

Eating low-fat foods is healthier

- True
- False

Low-Fat Is Not the Answer

- The problem with low-fat foods is that when removing the fat, food companies add more sugar
- Excess sugar is one of the contributors to fatty liver and raises our levels of triglycerides, both of which are markers of metabolic syndrome
- It is better to go for moderate portions of the whole-fat version and make sure you are eating all your nutrients

Poll

Eating fatty foods is unhealthy

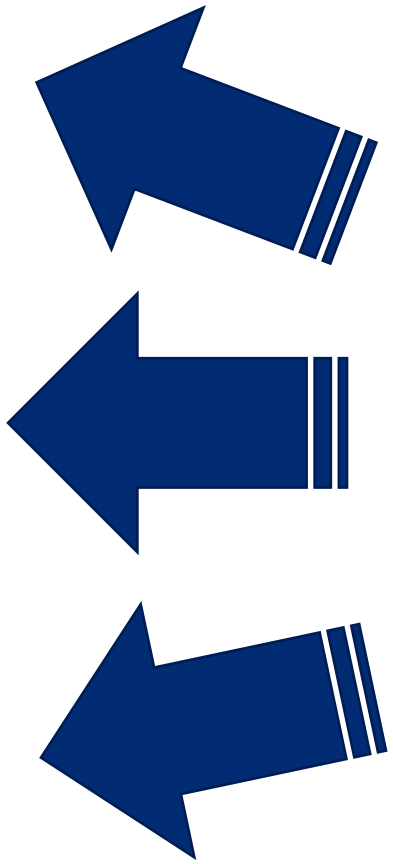
- True
- False
- Depends on the type of fat

Types of Fat

1. Omega-3 fatty acids: Found in fish and some vegetables, these fats are anti-inflammatory and heart-healthy
2. Monounsaturated fatty acids: Found in olive and avocado oil, these fats are good for the liver and can help maintain healthy cholesterol levels
3. Polyunsaturated fatty acids: Found in nuts, seeds, and some seafood, these fats can help lower LDL cholesterol and support cell membrane health
4. Saturated fat: Found in meats and dairy, this fat may be neutral for cardiovascular health and diabetes for most but not all people
5. Medium-chain triglycerides: Found in coconut oil, these fats are vegan but can be unhealthy if mixed with lots of saturated fat
6. Omega-6 fatty acids: Found in highly processed seed oils like corn, cottonseed and soybean, these fats may drive inflammation
7. Trans fats: These fats are considered the worst type of fat

Wellness Affects All Body Systems

- Messaging
  - Nervous
  - Endocrine
  - Immune
  - Reproductive
- Plumbing
  - Respiratory
  - Cardiovascular
  - Digestive
  - Urinary
- Support
  - Skeletal
  - Muscular
  - Integumentary



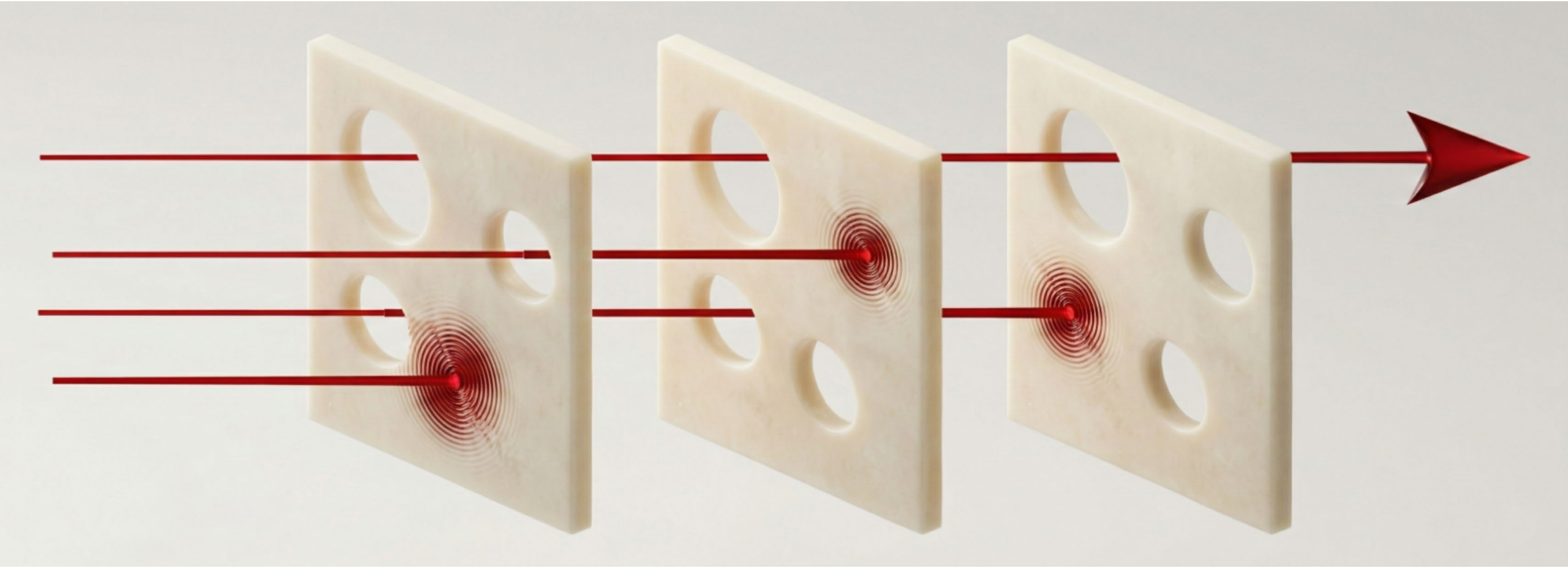
- Sleep Hygiene (Webinar)
- Positive Relationships (Webinar)
- Mindfulness (Webinar)
- Nutrition (Webinar)
- Exercise (Webinar)

Fatigue Management Program (FMP)

- Safety Culture
  1) Education
  2) Training
  3) Continuous communications – Including partnerships
- Fatigue Risk Management System
  1) Operations
  2) Identify risks with processes and controls
     - Predictive, proactive, reactive
     - Sound scheduling, sleep disorders management program, fatigue detection technologies
  3) Risk assessment
  4) Measures and countermeasures
  5) Evaluation

FMP Template
Module 2: Safety Culture and Management Practices
Implementation Manual

The Swiss Cheese Model



CVSA

NAFMP

North American Fatigue Management Program

nafmp.org

NAFMP Website Free Resources

- Tools
  - FMP Template
  - Implementation Manual
  - ROI Calculator
- Courses
  - eLearning Platform
  - PowerPoints with and without audio
  - For carrier's executives, safety managers, dispatchers, instructors, drivers, driver's families, shippers & receivers
- Webinars, Info Sessions & Articles
  - Gallery
  - List
  - Categories
  - Sing up for article notifications
- Podcast
  - The NAFMP Pod
  - Available from eight platforms
- Events
  - Download individual event
  - Subscribe to Calendar of future events

Connect with me to coordinate a free fatigue management session for your organization

Rodolfo Giacoman
Fatigue Management Specialist
Commercial Vehicle Safety Alliance

Rodolfo.Giacoman@CVSA.org
202-998-1830

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