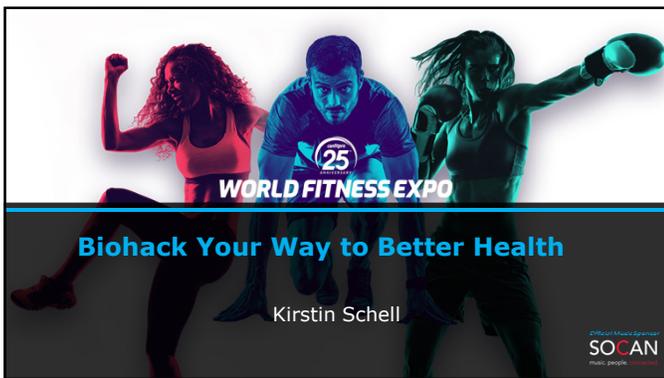


What is Biohacking?

- The activity of exploiting genetic material experimentally
- Process of making changes to your lifestyle in order to hack your body's biology and feel your best
- A systems thinking approach to our own biology
- Experienced based learning
- The desire to be the absolute best version of ourselves
- Quest for personal optimization

How can it be useful to you?
Your clients?

- Actionable small measures that can improve health
- Professionals committed to trying and finding solutions
- Allows healthy habit building and progression
- Remember the BIG picture!



Types

- External: Using technology or equipment to conduct experiments to 'hack' the body
- Internal: Using medicine, supplements, or exercise to 'hack' the body for optimal performance
- Remember validity question
- Focus of session: Internal and easy to apply techniques

EFFECTS OF STRESS ON THE BODY

Biohack the Nervous System

Recommendations

Breathing

- Focus on breathing has been gaining in popularity
- Increases oxygen supply
- Decrease cortisol
- Increase pleasure neuro-chemicals
- Reduced tension in muscles
- Lower blood pressure
- Increase lung and heart capacity
- Improved management of depression/anxiety

Forest Bathing

- Being in the presence of trees
- National public program in Japan since 1982
- 2004-2012 4 million spent studying effects
- Lower heart rate and blood pressure
- Reduce stress hormone production
- promote lower concentrations of cortisol, lower pulse rate, lower blood pressure, greater parasympathetic nerve activity, and lower sympathetic nerve activity than do city environments
- Boost immune system (increase in NK cells)
- Considered related to essential oils found in nature (protective substances phytonicide)

Breathing

- Automatic but not...
- Resurgence in breathing technique and emphasis
- Horizontal versus vertical breath
- Prioritize nose breathing
- 4-7-8 Relaxation technique
- Breathing in all directions
- Alternate nostril
- Trial and error
- No wrong way to focus on breath!

Go Barefoot (Earthing)

- Focus to clear your mind
- Reflexology
- Decrease anxiety and depression
- Improved sleep
- Our bodies are over 60% water. Earth has negative ion charge and barefoot grounds our bodies to that charge = detoxify, calm, reduce inflammation, hormonal balance

Cold Showers

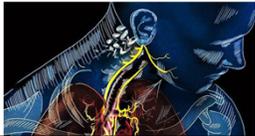
- Surge of oxygen due to breathing
- Improved circulation by increased blood flow
- Some indications it increases brown fat (vs white) (up to 15 x)
- Increases tolerance to stress/nervous system
- Improved immunity (glutathione = antioxidant performance), white blood cells
- Relieve depression symptoms (intense impact of cold receptors = electrical impulse to nerve endings)
- Increase testosterone in men
- Cold/Hot = clear lymph system
- Support for increase alertness in AM and great sleep in PM

Heart Rate Variability (HRV)

- Variation in the time interval between heartbeats
- A healthy heart beat contains irregularities
- The autonomic nervous system has parasympathetic and a sympathetic branch.
- HRV can help us understand which dominates
- Higher is generally better for HRV
- Individual and should only be compared to yourself
- Stress, dehydration, alcohol, poor sleep, and illness lower HRV
- Higher HRV indicates recovery from exercise and ready to go!

Vagus Nerve

- Longest and most complex of cranial nerves
- Vagus means wanderer: connects the brain to the gut and other organs
- Critical for parasympathetic activity



HRV-How to use it



- Devices like Oura
- Some heart rate monitors: POLAR and phone apps
- Morning testing
- One week of baseline testing
- Adjust your lifestyle and training based on results

Care for the Vagus Nerve

- Who might suffer from low vagal tone?
- SINGING/CHANTING: works muscles back of throat = vagus
- GARGLING: water to contract muscles back of throat
- DEEP BREATHING: stimulates vagus and diaphragm
- LAUGHTER: increase HRV, lower cortisol
- FOOT MASSAGES: shown to increase vagus activity
- ACUPUNCTURE: locations in ear
- TENSING STOMACH MUSCLES: bear down
- CHEW FOOD WELL: correct sequence of digestion
- DEFICIENCIES?: B12, neurotransmitters (acetylcholine)

Decrease Chemical Exposure

- Food quality
- Reduce/eliminate plastic: endocrine disruptors BPA
- Body Products: <http://www.ewg.org/skindeep/>
- Cleaning products: <http://www.ewg.org/guides/cleaners>
- Home/car scents

Decrease Chemical Exposure

- Cut out Aluminum (deodorant, OTC meds, tin foil, pans)
- Pesticides
- Petrochemicals
- Heavy metals
- Phthalates/BPA
- Colours/Flavours

Sleep

- Importance for health and performance
- Improves learning and skill acquisition
- Healthy balance of hormones (insulin, ghrelin and leptin)
- Critical for immunity
- Wrist trackers/phones monitor movement
- More advanced options available.
- Sleep Hygiene

Essential Oils

- Volatile oils extracted from plants
- Significant part of medicine historically
- Science is slowly catching up
- Antimicrobial and anti-inflammatory (Oregano, Tea tree)
- Anti-anxiety/stress (lavender, vetiver, ylang ylang, chamomile)
- Cognitive function, mood and memory (rosemary, peppermint)
- Alleviate pain, stiffness and aches (peppermint, wintergreen)
- Internal, aromatic, dermal

Sleep

- Sleep in complete darkness
- Ensure room is cool (16-18 degrees Celsius)
- Consistency
- Early exposure to light
- Blue light blocking (Install FLUX on computer)
- Limit caffeine after lunch
- Understand your body's response to exercise, alcohol and food
- Consider natural help: melatonin, valerian, magnesium

Put Down Ibuprofen!

- Advil, motrin
- So common with general population and athletes
- Work by inhibiting prostaglandin syntheses (inflammation)
- BUT it's inflammation that heals you
- So, it delays healing: soft tissues- muscles, ligaments, tendons, cartilage
- Studies showed significant intestinal damage and permeability
- Did NOT improve performance
- So...acetaminophen?

Biohack the Immune System

Immune System

- Digestive health (80% immune system in gut)
- Sleep
- Manage stress
- Attitude, attitude, attitude
- Vitamin D, zinc, probiotics
- Some of the most studied and used herbs for immune function include: echinacea, elderberry, astragalus, ginseng, garlic

Care for Digestive System

- Searches for digestive health up 250%
- Eat slowly and without distraction
- Find a way to manage stress: parasympathetic
- Prioritize sleep
- Exercise regularly
- Adequately hydrate
- Be mindful of medications
- Include 40g of prebiotics daily: asparagus, leeks, onion, garlic, chicory root, green(ish) bananas, barley, oats, apples, flax, jicama
- Consume fermented probiotic rich food: kefir, kombucha, miso, tempeh, some yogurt
- Eat your fiber: soluble and insoluble (25-40g)
- Decrease processed/dead foods

Lymphatic System

- Cleanse toxins and protect against harmful invaders
- Carry blood waste away
- Through the lymph system immune cells can travel to fight pathogens
- It does not have a pump (like blood)
- Trampoline jumping
- Inversion table
- Hydrate
- Massage
- Dry brushing

Nutrition

Oil Pulling

- Therapy is a type of Ayurvedic medicine that dates 3,000 years
- Microorganisms in mouth are single cell covered with fatty membrane. These stick to other oil and then are spit out
- Mouth health contributes to overall health
- Whiter teeth, improved immune, better breath, cavity prevention (headaches, hangovers, skin issues)
- 1 tsp coconut oil – anti microbial + EOs (clove)
- 20 minutes goal of gentle swishing
- Spit it out (not in sink!)

Nutrition Strategy- LOW FODMAP

- **Fermentable** – broken down (fermented) by bacteria in the large bowel
- **Oligosaccharides** – “oligo” means “few” and “saccharide” means sugar. These molecules are made up of individual sugars joined together in a chain
- **Disaccharides** – “di” means two. This is a double sugar molecule
- **Monosaccharides** – “mono” means single. This is a single sugar molecule
- **And Polyols** – these are sugar alcohols
- Why try? Unexplained digestive struggles, autoimmune
- Not meant as a permanent solution
- Many ‘healthy’ foods contraindicated on this plan: garlic, onions, whey protein, agave, wheat, some beans/legumes, cauliflower, high fructose fruits, inulin, sweeteners

Nutrition Strategy

- **LIMIT HISTAMINES**
- To try if: headaches, brain fog, low energy but eating healthy
- **HIS: Histamine Intolerance Syndrome**
- Low levels of diamine oxidase-enzyme that metabolizes histamine
- Foods high in histamines: fermented foods, fermented drinks, aged cheese, nightshade veggies, processed meats, nuts, dried fruit, wheat, bananas, cocoa
- Attempt an elimination protocol

Intuitive Eating

- The term intuitive eating was coined by Evelyn Tribole, RD, and Elyse Resch, RDN, in the 1990s
- Intuitive eating means breaking free from the on-and-off cycle of dieting and learning to eat mindfully and without guilt.
- Reject diet mentality
- Honor your hunger
- Make peace with food
- Respect your fullness
- Discover satisfaction
- Honor your feelings with using food

Nutrition Strategy

- **VARY YOUR ANIMAL PROTEIN**
- Favoring muscle meat = high methionine (accelerated aging)
- We generally need more glycine = organ meats, collagen rich parts like marrow and skin
- Include bone broth
- Variety!
- Quantity depends on quality

Nutrigenomics

- Study of how genetics interact with foods we eat
- Supports: 'Not one size fits all' approach
- Personalization
- Example: gene FTO rs9939609 predispose to weight gain
- Expensive: \$800-\$1000 plus follow up
- Lacks definite answers

Intermittent Fasting

- Generally 16-36 hours fasting
- Possible benefits: improve glucose homeostasis, higher energy, increase GH, reduce inflammation, improve BC
- IF can cause glucose concentrations to decrease (reduced glucose oxidation) and lipolysis (fatty acid oxidation) to increase significantly during the first 24 hours.
- Average dropout rate of studies is over 30%
- Careful women! Hormones
- Who is not a good candidate
- Need to consider WHO is doing it and HOW

Superfoods?

- Mushrooms: Chaga, reishi, cordyceps
- Moringa: tree powder
- Collagen: protein-skin, joint pain
- Maca: root veggie powdered-adaptogen
- Cricket flour: protein, magnesium
- Maqui berries: fiber, anti-inflammatory
- Who remembers superfoods of the past?

Supplementation

- Magnesium
- Vitamin D3 + K2
- Omega-3 oil
- B vitamins
- Curcumin/anti-inflammatory
- Creatine
- Probiotics

Hacking Metabolism – anecdotal

- Lemon water in AM
- Shorten eating window
- Eat every 4 hours
- HIIT
- Sleep more/better
- Early morning walk/light exposure
- Avoid MSG & fructose
- Increase Omega-3
- Ease stress/meditate
- Heal your gut/determine sensitivities
- Get more fiber
- submerge/swim in very cold water
- Fasted workout
- Coffee/caffeine pre-workout

Productivity

- Make your bed
- Meditate/mindfulness/gratitude
- Do 10 reps of something
- Cold shower
- Make a plan/daily achievements
- Remember the Pareto principle 20% action produce 80% results
- Don't let others determine the path of your day
- Plan breaks every hour: posture/breathing

