REHAB SUMMIT

505: Nutrition's Impact on Performance & Recovery in Rehabilitation

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505: Nutrition's Impact on Performance & Recovery in Rehabilitation

Cindi Lockhart, RDN, LD, IFNCP

Financial: Cindi Lockhart is owner of Lockhart Wellness Solutions, LLC. She receives a speaking honorarium from PESI, Inc.
Non-financial: Cindi Lockhart is a member of Academy of Nutrition and Dietetics; Dietitians in Integrative & Functional Medicine; and Institute for Functional Medicine.

Session 505:

The Role and Impact of Nutrition in Rehabilitation

Cindi Lockhart, RDN, LD, IFNCP

Learning Objectives

1. Articulate how nutrition impacts a patient's overall function and recovery during rehabilitation services
2. Determine how to assess a patient's nutritional status and when to refer out to a nutrition professional
3. Identify common nutritional risks and articulate action steps to help optimize a patient's nutritional state

Keep an Open Mind

- The body is a **whole, interconnected system** vs segregated parts
- **Nutrition is a science, which continues to evolve**
  - Important to stay current in the evidence
- **Symptoms are common but not normal**
  - Symptoms are a sign that something deeper is off
- **N of 1** – we are biochemically unique | what works for one may not for the other
  - A 'one size fits all' approach doesn't work

Don't Forget Experience

EVIDENCE BASED

N OF 1

CLINICAL PRACTICE

Food as Medicine

Nutrition impacts energy, sleep, & physical recovery

Food as Medicine

- **Using lifestyle medicine for disease prevention is gaining awareness**
- **Nutritional strategies used to**:
  - *Stabilize & even reverse chronic disease*
    - Obesity
    - Cardiovascular disease
    - Type 2 diabetes
    - Associated co-morbidities to the above: depression, osteoarthritis, functional bowel disease
  - *Improve treatment efficacy*
  - *Reduce cost & risk to patient/client*
    - Less expensive, safer, less side effects than poly-pharmacy

Food as Medicine

- **Unlike medication, food does not function in isolation**
  - Synergistic impact of nutrients in food
  - Act on multiple tissues/organs
  - General U-shaped effect on function – deficiency vs overdose
  - Effects of nutrients more subtle & occur slowly over time
  - N of 1 impact
- '**One size fits all' approach has limitations** – multi factorial diseases now dominating

N of 1: One Person's Medicine is Another Person's Poison

- There is an ***increase in adverse food reactions*** in adults.
- Despite recent advances, best management of adverse food reactions = avoidance of food triggers
- Support by a trained nutrition professional is essential

Nutrition & Energy

- **With age, normal to have less energy than in younger years**
- **<u>Contributing factors</u>**:
  - Poor diet | processed foods
  - Undereating | undernourishment
  - Decreased physical activity
  - Reduced deep sleep
  - Excess stress
  - Chronic disease & medications
  - Nutrient deficiencies related to diet and/or poor GI function

Nutrition & Sleep

- **Studies & NHANES data show short sleepers (<6 hrs/night):**
  - Have higher caloric intakes, primarily from fat and snacks
    - ***Higher ghrelin*** – hunger hormone
    - ***Lower leptin*** – satiety hormone
  - Have a less diverse diet
  - Eat less protein, plants, fiber
- **Mediterranean diet = Anti-Inflammatory**
  - Associated with improved sleep quality in older adults, women > men

Nutrition & Sleep

High Carb Diet

- Reduced sleep onset latency – time to fall asleep
- Reduced slow wave sleep (deep, restorative sleep)
- Increased REM sleep (memory)

High Fat Diet

- Decreased sleep efficiency (time in bed, asleep)
- Increased slow wave sleep (deep, restorative)
- Decreased REM sleep (memory)

Nutrition & Physical Recovery

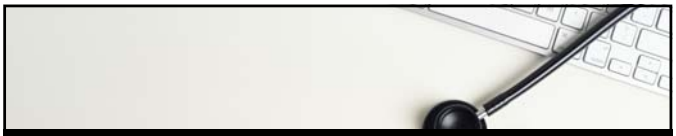
- **Vascular changes –** Dietary effects:
  - ***Blood flow to muscles***
    - Muscles during exercise require an increase in blow flow
      - *Nitrate rich green veggies & beet juice help increase blood flow*
      - *High fat meals decrease blood flow*
  - ***Glucose uptake into muscles***
    - Insulin resistance → muscular fatigue
      - *High fat > high carb intake*
  - ***Oxidative damage*** to endothelial cells lining blood vessels
    - *High fat meal ↑ oxidative damage, impairing blood flow to muscles*
    - *Antioxidants help neutralize damage from oxidation*

Protein & Recovery

- Exercise ↑ muscle protein synthesis
- ***Nutrient intake post-exercise*** is critical: EAA's + leucine primarily responsible
  - Immediate (first 1-5 hrs) post-exercise
  - Prolonged (5-72 hrs) post-exercise
- ***Nutrition Organization recommendations***: 1.2-2.0 gms/kg protein to optimize metabolic adaptations, repair & remodeling of skeletal muscle tissues in healthy physically active adults
  - Lower range: strength based activity
  - Higher range: endurance based activity or decreased caloric intake

Protein

- ***Disperse protein evenly*** throughout the day
  - 20-40 gms / meal – 2 decks of cards
  - Whole food vs isolated protein source?
    - *Nutrient density & satiety benefits to whole foods*
- Overwhelming consensus: ***RDA of 0.8 gm/kg is not sufficient*** to optimize post-exercise muscle protein remodeling & recovery
- ***Age matters***
  - Younger individuals (20's) can maximize muscle protein synthesis with ~0.25 gm / kg / meal = 20 gms for a 175#
  - Older individuals (70's) require ~0.4 gm / kg / meal = 32 gms for 175#



Nutritional Insufficiencies & Excesses

Stats

- ***Americans are over-eating, yet are malnourished***
  - Energy-rich, nutrient-poor diet
- ***Obesity*** is a public health problem
  - >33% Adults (1 in 3)
  - 17% children & adolescents (1 in 6)
- ***Obesity-related conditions***:
  - Heart disease
  - Stroke
  - Type 2 diabetes
- ***50% American adults have at least 1 preventable chronic disease***

Diet – State of the State

- **Dramatic Change since WWII**
  - ***Used to***:
    - Eat food shortly after harvest
    - Eat seasonally
    - Eat meat occasionally, wild
  - ***Now***:
    - New strains of grain (wheat, soy, corn)
    - GMO crops (US > whole world)
    - Chemicals for crops
    - Dairy cows injected with hormones
    - Antibiotics, heavy metals, and hormones used in CAFOs – beef, pork, poultry
    - Artificial preservatives, colorings, flavorings, sweeteners
    - 'Frankenfoods'

SAD – Standard American Diet

Too Much

Don't eat foods that will outlive you!

- Processed | Packaged foods
- Artificial ingredients
- Refined grains
- Sugar & Salt
- Processed & Saturated Fats
- Alcohol

Too Little

- Whole, natural foods
- Fresh vegetables and fruits
(1.1 fruit & 1.6 veggie/day – adults)
- Healthy fats and oils
- Quality proteins
- Fiber

SAD Consequences

- Risk ↑ ***blood sugars, A1c and LDL levels*** – systemic inflammation
  - Circulating sugars combine with proteins & lipids in the body to create damaging compounds called AGE's = advanced glycation end products
  - AGE's bind to receptors called RAGE's
  - RAGE-AGE complex stimulates NFkB, which activates multiple inflammatory genes

- ***Mitochondria*** = energy powerhouses in every cell in body
  - Dysfunction arises from dietary toxins/chemicals creating free radicals
  - Free radicals stimulate inflammatory processes, resulting in cell death

Most Common Nutrient Insufficiencies

CDC |NHANES & EWG | Linus Pauling Institute

- Vitamin D
- Iron
- Vitamin B12
- Iodine
- Calcium
- Magnesium

Oxidative Stress & Inflammation

Oxidative Stress

- ***Imbalance between production of free radicals & ability to counteract or detoxify (neutralize) them***
  - Free radical = O2 containing molecule, missing 1+ electrons, resulting in high reactivity with other molecules
    - Interacts with cells like DNA, protein, or lipids in attempt to 'steal' an electron to help it stabilize – this destabilizes the original cell, leading to a chain reaction

Inflammation

- Central component of innate (non-specific) immunity
- WBC's enter blood or tissue/s to protect against an invader (i.e. bacteria or virus)
  - Blood flow to area increases - LOCAL
- **Purpose** = eliminate toxic agent/s + repair damaged tissue
- **Acute or chronic**
  - ***Acute*** – short lived | resolves in hours or days
  - ***Chronic*** – long lived | lasts months or years after initial trigger

2 Underlying Causes of Chronic Disease

Inflammation - Causes

- Stress & inadequate sleep
- Diet – nutrient deficiencies | food sensitivities
- Gut dysfunction
- Hormone imbalances
- Exercise – too little OR too much
- Injury
- Toxins | smoking
- Infection | viruses

Oxidative Stress - Causes

- Excess calories | obesity
- High fat, sugar diets
- Pesticides & chemicals
- Infections – bacteria | viruses | yeast
- Pollution
- Tobacco & alcohol
- Radiation & excess UV exposure
- Medications
- Emotional stress

Signs of Oxidative Stress

- Fatigue
- Brain fog | poor memory
- Muscle and/or joint pain
- Wrinkles
- Gray hair
- Reduced vision
- Headaches
- Increased risk for infections

Signs of Inflammation – Acute

- Pain
- Redness
- Immobility | Loss of function
- Swelling
- Heat

Health Consequences

Oxidative Stress

- Neurodegenerative diseases
- Cancer
- Chronic fatigue
- Heart & blood vessel disorders
- Inflammatory diseases

Inflammation – Chronic low-grade

- Heart disease | Stroke
- Cancer
- Respiratory disease | Asthma
- Alzheimers
- Diabetes
- Autoimmune diseases
- Arthritis + pain
- Sarcopenia

Sarcopenia

- **Loss of muscle mass & function -** common with aging & progression of various chronic diseases
  - Present in 5-13% individuals aged 60-70 & 11-50% aged >80
  - Reduces rehab treatment efficacy
  - Increases risk of falls & fractures
  - Reduces quality of life

Pro-Inflammatory Food Sources

- **Trans fats** & **Saturated fats***
  - Fried foods, margarine, baked goods
- **Omega 6 oils** – processed foods
  - Safflower, sunflower, corn, soybean
- **CAFO meats –** hormones, pesticides, antibiotics
- **Processed foods**
  - Can you ID & pronounce ingredients?
- **High sugar intake –** HFCS, etc
- **Low fiber diets**
  - Legumes, fruits, vegetables, seeds, whole grains
- **High glycemic carbohydrates***
  - Refined/processed grains
- **Cow dairy & gluten?**
  - A1 vs A2 casein

Pro-Inflammatory Carbs & Fats

- **High glycemic carbs** → post-prandial hyperglycemia → leukocyte activation & AGE's → endothelial damage & dysfunction → increased inflammation
- **Saturated fat** → metabolic endotoxemia & pro-inflammatory immunoregulatory molecules (i.e. LPS) → metabolic risk
  - LPS = potent inflammatory stimulant
  - Also stiffen cell membranes
- **Trans fat** – body can't break down
  - 1 chemical molecule away from plastic
  - Irreversibly disrupts cell membrane & alters function
  - Check label: hydrogenated or partially hydrogenated oils

Insulin & Glycemic Balance

- **Each time one eats, pancreas releases insulin**:
  - Shuttles glucose to liver, muscle, & fat cells
  - Stores fat with any glucose not needed
    - When fat cells 'full', fat storage occurs in other cells/organs – liver, muscles, pancreas
      - Fatty liver, diabetes, heart disease, high blood pressure, cancer
  - ***Process continues for 2-3 hours after a meal/snack***
    - Eat more often – store fat more often
  - ***Insulin secretion highest during the day & slowest at night***
  - Fasting for >6-7 hrs allows fat burning to occur - TRE

Also…

- **Artificial sweeteners** – induce metabolic dysfunction
  - Alters gut microbiota (saccharin & sucralose decreased protective bacteria & increased inflammation)
    - Stevia boosts protective bacterial species
  - Promotes insulin resistance | 'tricks body' that it's sugar

Anti-Inflammatory Diet

- **Whole foods**
- **As organic as able financially**
  - Animal-based foods
  - Dirty Dozen produce: https://www.ewg.org/foodnews/dirty-dozen.php
- **Grass fed/finished meats**
- **Pasture raised poultry & eggs**
- **Omega 3 fats**:
  - Wild caught fatty fish – salmon, mackerel, herring, sardines
  - Walnuts, flaxseed, chia seeds
- **Rainbow of color of fruits/veggies**
  - 1-2 svg/color/day variety = diversity
  - Antioxidants 'neutralize' oxidative stress

1st step – Elimination Diet

- **Avoidance phase** – remove specific foods for 3-4 weeks
- **Re-introduction phase** – add foods back in, one at a time, over 3 days, to assess reaction to specific foods
  - *Optional*
  - *Track tolerance* – potential symptoms:
    - GI function
    - Joint/muscle ache
    - Skin
    - Energy
    - Sleep
    - Headache
    - Nasal/chest congestion

Elimination Diet Types

- **Basic or Full Elimination** (many variations)
  - ***Basic*** – No cow dairy and/or gluten
  - ***Full*** - No cow dairy, gluten, soy, corn, peanut, shellfish, beef, eggs, sugar, alcohol, caffeine + potentially citrus and/or nightshades
- **Low FODMAP**
  - Often used with GI related issues like IBS
- **Specific Carbohydrate Diet**
  - More conservative approach to GI related issues like IBD, celiac, or SIBO

Elimination Diets

- Lack of well-designed studies & tests to identify intolerance to specific food components
  - *IgG food tests more often reflection of food exposure and/or GI health status*
- Trial-and-error approach is used in clinical practice = gold standard
- Selection of which foods to remove based on the clinical picture including symptomatic profile, habitual diet, suspicions of food intolerances, etc

Best implemented under the guidance of a Registered Dietitian

2nd Step - Mediterranean Diet

- **Widely recognized** - model of 'healthy eating'
- **Plant based**
- **Protection against oxidative stress** – high in antioxidants
  - Reduced levels of 8-OHdG when compared to high SFA diets = biomarker of generalized, cellular oxidative stress
- **Anti-inflammatory** – O3 > O6 fats
- **Impacts on gut microbiome, impacting metabolic health**
  - Bacteroidetes, SCFA's, butyrate – potential of attenuating inflammatory, autoimmune, and allergic disease

Mediterranean Diet Inclusions

- Plenty of colorful fruits & vegetables
  - Diversity counts!
- Whole grains
- Nuts / seeds
- Legumes – at least 3x/wk
- Olives, avocado
- EVOO as the primary oil used
- Herbs/spices
- Fish 2-3 meals/wk – wild caught
  - Salmon, sardines, herring, mackerel
- Poultry few x's/wk
- Fermented dairy IF one tolerates
- Red wine – low to moderate portions with meals
- Locally grown, seasonally fresh

Mediterranean Diet Restrictions

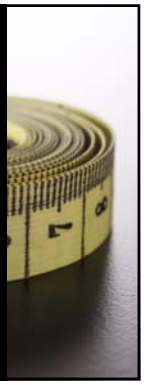
- Red meat (slow cook, low heat)
  - Opt for lean, grass fed options
- Refined/processed grains
- Fried/fatty foods – trans & saturated fats
- Sweets, sugary drinks

Food Helps Manage Pain

- **2018 study reviewed 172 eligible studies to determine 'food pyramid' that best supports patients with chronic pain**
  - Anti-inflammatory
  - Low oxidative stress
- **Components = Mediterranean**
  - ***Daily***
    - 5 servings fruits & veggies
    - 3 servings low glycemic whole grains
    - Yogurt, red wine, & EVOO
  - ***Weekly***
    - 4 servings legumes & fish
    - 2 servings poultry, eggs, cheese
    - 1 serving red or processed meat

Methods of Assessing Nutritional Status

Anthropometrics



Populations at Risk for Inadequate Nutrition

- **Obese** – over-feeding & under-nourishing
- **Elderly**
- **Chemotherapy**
- **Multiple medications** –food/drug interactions
  - ***Drug-induced nutrient deficiencies easily overlooked***
    - Develop slowly
    - Drugs may affect GI motility & microbiome – appetite, digestion/absorption of nutrients

Anthropometrics

- **Simple, convenient, inexpensive, & non-invasive method way to assess nutritional status**
  - Better assesses broad spectrum of nutritional state
  - *Biochemical indicators and clinical signs better assess extremes of malnutrition*
- **Nutritional Status imbalances**
  - ***Over-nutrition*** = excess calories with risk of chronic health conditions
  - ***Under-nutrition*** = insufficient intake of one or more essential nutrients
    - Short-term impact: weakness, fatigue, recurring illness
    - Long-term impact: weakened immunity, loss of weight

Types of Antropometrics

- **BMI = body mass index** = <18.5 underweight & >30 obese
  - ***Pros***:
    - Highly correlated with fat & fat free mass
  - ***Cons***:
    - Age – lose fat free mass & gain fat mass as age
    - Edema – may increase with malnutrition, however results in an artificially higher BMI
    - Not aligned across all cultures (Asians with lower BMI had higher body fat) – skinny fat
- **MUAC = mid-upper arm circumference** = <23 cm in men & <22 cm in women indicative of undernutrition
  - ***Pros***:
    - Indicates arm muscle & sub-cutaneous fat, which correlate with survival in starvation
  - ***Cons***:
    - Insufficient data correlating undernutrition across ethnicities
    - Age-specific values may be needed as subcutaneous fat more common in central areas of body during aging
    - Bilateral asymmetry

Anthropometrics

- **Waist circumference** or **Waist:Hip ratio** or **Waist:Height ratio**
  - W:H better predictor of cardiometabolic dysfunctions than BMI
    - WC should be <= ½ height
- **Composite Score** – calculation utilizing 12 standardized anthropometric variables with ***negative score = undernutrition***
  - Height
  - Weight
  - MUAC
  - Calf circumference
  - Waist circumference
  - Hip circumference
  - Biceps skinfold
  - Triceps skinfold
  - Calf skinfold
  - Subscapular skinfold
  - Suprailiac skinfold

Nutrition Physical Exam

Nutritional status –

Importance on Function

- **2019 study evaluated 415 patients ≥ 65 yrs of age**
  - Poor nutritional status correlated with lower performance for ADL's
- **Micronutrient deficiencies** – clinical overt symptoms
- **Micronutrient insufficiencies** – covert symptoms, difficult to detect clinically
  - Fatigue
  - Reduced concentration & focus
  - Impaired mood & memory
  - Increased risk for chronic disease such as diabetes, heart disease, cancer, osteoporosis

5 Domains of Nutrition Physical

- Skin
- Nails
- Hair
- Eyes
- Mouth

Skin

Skin - Correlations

- **Low EFA's** – wound healing, hydration
- **Skin-gut connection** – acne, hives, eczema, bruising, rosacea
- **Skin-stress connection** – acne, hives, psoriasis, eczema, rosacea, alopecia, vitiligo
- **Food reactions** - rash, hives
- **Cardiometabolic** – skin tags, acanthosis nigricans, diagonal earlobe crease

Skin Assessment

- ✓Check for unhealed wounds
- ✓Dehydration check
  - ✓Hypothenar eminence test
  - ✓Skin pinch test – elderly
- ✓Check for acne, hives, eczema, rosacea, bruising, vitiligo
- ✓Check for skin tags, acanthosis nigricans, diagonal earlobe crease

Nails

Nails - Correlations

- **All nutritional imbalances affect the nails!**
- **Spoon nails** – anemia, low thyroid
- **Muehrcke's lines** (double white horizontal lines) – zinc, protein
- **Leukonychia** (white spots) – protein, zinc
- **Fungal** – yeast overgrowth, diabetes
- **Soft, splitting, cracked** – magnesium, biotin, low thyroid

Nail Assessment

- ✓Check for lines & spots
  - ✓Vertical lines reflective of normal aging
- ✓Check for clubbing
- ✓Check for spooning
- ✓Check for fungal nails
- ✓Check for splitting or cracked nails

Hair

Hair - Correlations

- **Lackluster, thin, sparse**
  - Lower protein, zinc, iron, biotin
  - High stress
  - Very low calorie diets
  - Thyroid and/or adrenal imbalance
- **Hirsutism** – excess dark/coarse hair growth on face, chest, back + frontal baldness (females)
  - PCOS
  - Insulin resistance | diabetes
- **Gray hair, especially in younger adults**
  - Excess oxidative stress

Hair Assessment

- ✓Check health of hair
  - ✓Shine
  - ✓Thickness
  - ✓Loss – frontal, vertex, complete
  - ✓Color (if not treated)
- ✓For females, check for hirsutism

Eyes

Eyes - Correlations

- Often a sign of dormant, undiscovered nutrient deficiencies
- **Pale eyelids** – iron
- **Dry eyes** – oxidative stress, autoimmunity, vit A, diabetes
- **Bitot spots** – vit A

Eye Assessment

- ✓Check for or ask patient regarding these symptoms

Mouth

Mouth - Correlations

- **Halitosis** – fungal/bacterial infection, dysbiosis, GERD, periodontitis, URI
- **Red, raw tongue** – B vitamins
- **White/yellow coating or fissures** – fungus, yeast, bacteria infection
- **Geographic tongue** – chemical sensitivity, allergies, stress, hormone imbalances, B vits, zinc
- **Cheilitis** – B vits, iron
- **Periodontitis** – check red, inflamed gums
  - High correlation with diabetes

Mouth Assessment

- ✓How is their breath?
- ✓Look at tongue –
  - ✓Red/raw/beefy
  - ✓White or yellow coating
  - ✓Fissures
  - ✓Geographic
- ✓Ask about taste ability
- ✓Look at lips – cheilitis
- ✓Look at gums – swollen red, inflamed?

Assessing Nutritional Intake

- **Weighed or not weighed options**
  - For most situations, especially outside the work with an RD, suggest no weight measure
- **Portion size estimation**
  - Household measure
  - Image
  - Food models

24 Hour Diet Recall

Pros

- Easy
  - Open-ended if you ask client
  - Close-ended if they record on own
- Captures diet intake over past 24 hrs including food, beverages, portions, brand, preparation

Cons

- Relies on memory
  - Not for cognitive impairment
- Common to 'underreport' intake
  - Foods & portions consumed
  - More common with women, overweight/obese, disordered eating, & smokers
- Represents only a single day
  - Misrepresentation of overall diet & nutrient intake

3-7 day Food Record – 3 days Recommended

Pros

- Easy
- Good estimate of short-term diet & nutrient intake if completed thoroughly (more so if measure)
- Record as you go – less reliance on memory
- More accurate assessment than 24 hr recall
  - Encourage at least 2 weekdays + 1 weekend day

Cons

- Self-reported
- Biased – report what they think you want to hear
- May affect 'what' foods are consumed & omitted
- Risk of lower completion rate the more days you request
- Under-report: found in ~59% men & ~67% women (more so in obese)

Food Frequency Questionnaire

Pros

- Good assessment of food 'patterns' long term – how often eat categories of foods
  - Daily
  - Weekly
  - Monthly
- Easy to complete with closed-ended multiple choice format

Cons

- Not suitable for cross-cultural comparison unless you use a targeted FFQ
- Relies on memory
- Prone to mis-reporting
- Time consuming to create & complete

How to Identify Nutritional Risk in Patients

- **Daily (frequency) of portions & type of food consumed**:
  - Vegetables
  - Fruit
  - Grains (whole vs refined)
  - Proteins (animal, plant, dairy)
  - Fats (saturated, monounsaturated, polyunsaturated, trans)
  - Sugar
  - Fiber
  - Alcohol

When to Refer Out to a Nutrition Professional

When to Refer Out – PT's Role

- **APTA 'Nutrition and Physical Therapy' webpage**
  - PT's role – screening for & providing general information
  - Collection of resources available
  - Additional certifications may be required to educate on nutrition
  - When to refer out – link to find RD's in area
- **Diet & Nutrition are critical components** of many conditions being managed by PT's - directly impacts recovery & overall function
- **General nutritional guidance acceptable** – found in public domain
  - More whole vs processed foods
  - Less sugar
  - More colorful plants, healthy fats, quality proteins

When to Refer out to an RD

- **When to refer out**
  - When required advice is beyond PT's scope of practice & education
  - Patient requires specific nutrition guidance (kcals, macros, grams, or structured Elimination Diet)
  - Patient requires medical nutrition therapy – specific guidance for a medical condition
  - Patient on medications – drug/nutrient & drug/food interactions
  - Patient requires supplementation guidance
- **State specific** – check your state's scope of practice
- **Can not use designation of 'nutritionist' unless you hold a license or certificate** with professional liability insurance OR state doesn't require licensure to practice nutrition

Action Steps to Take to Optimize Nutritional Status

- Increase nutrient density
- Increase phytonutrient & fiber intake
- Achieve nutritional balance
- Optimize glycemic balance
- Decrease inflammatory & oxidative stress aspects of diet

Practical Application

Case Study

Case Study: History

CJ is a college student – on 5+ meds

- **25 yo Female** :
  - ***IBS-D***
    - On amitryptilline 2 yrs which resolved diarrhea, but then was constipated & got tachycardic, fatigued, light headed with BM
    - Also c/o abdominal pain, gas, bloat, nausea
    - GI assessment score 175 (anything above 50 is severe)
  - ***Fibromyalgia & chronic pain*** – on Tizanidine prn
  - ***Migrainous vertigo & POTS (postural dizziness) – on Lexapro***
    - Got very ill at age 20 with 1st vertigo attack on way to college class
    - Took leave & finished school at home in bed
  - ***Horrible PMS*** – Tylenol 3-4x/day during period
    - Horrible cramps, pain, fatigue – bedridden
  - **Tachycardia since 23** – on florenef
  - **Acne & eczema**

Other Pertinent Info

- **Trigger for seeking out help** – wants to be able to function again (school, artwork, friends, family) – missing out on so much at 25 yo
  - Couldn't ride in car, stand >15 min, shower, or even make it to local Target for quick errand
  - All diagnostic studies & work with Mayo WNL
- **Symptoms changed after school leave at 20**
  - Diarrhea 10x/day then constipation/diarrhea alternate, nausea esp in AM, fatigue – after BM, down for 3-4 hrs
  - Low grade fever, flu-like, sweating/hot flashes
  - Pain, lightheaded

Labs & Assessments

- **Labs**:
  - NutrEval 'not bad' – only nutrients in need ALA, vit C, B12, magnesium, amino acids
  - Stool Analysis – dysbiosis (test not remarkable)
  - Ferritin 8L
  - Vit A 33L
  - Vit D 53

Current Diet

- **Diet** –
  - Food intolerances: dairy, ? Soy, spicy & fried foods, fatty foods
  - 100+ oz water/day - bottled (only 137#); no ETOH; 1 C coffee in AM
  - Fast eater, late night eater, crave carbs (toast, pretzels, chips, pancakes)
- **Meals** -
  - Breakfast – nespresso, rice chex & almond milk
  - Lunch – plain bagel with butter, cheese, lettuce, avocado OR Choc RX bar
  - Dinner – salmon, kale salad with dressing, mashed potatoes OR Punch pizza with salad
  - Snacks (1x/day) – pretzel sticks, sourdough bread with butter, chocolate milk

Current Stress, Sleep & Exercise

- **Stress** – high due to health
- **Sleep** – rates 'ok'
  - 8-10 hours
  - Using Unisom
  - Bed 12A & Awaken 9A (or later) – can't function until later AM at the earliest
  - Awakens related to pain
  - Watches TV 7P – bed & uses tech in bed
  - Hx: used to get 5 hours/night during high school
- **Exercise –**
  - Gentle stretching each day for 5-10 min
  - Can't tolerate it

Goals

1. Best diet for managing IBS

Prioritized Lifestyle Plan

Where would you start?
What would you suggest?

- Sleep
- Nutrition
- Stress Management
- Exercise

What we Did

1. **Sleep** – sleep hygiene
   - Work toward earlier bed time for best physical repair; starting with 11-11:30P
   - Ditch the technology in & before bed
     - Tech free zone 20-30 min before bed
     - Put phone & computer on other side of room
2. **Nutrition** – Elimination Diet
   - Nutrient balanced meals for BS balance
   - RO filtered water with pinch of sea salt
   - Mindful eating practice

What we Did

3. **Mindfulness** –
- Start with 5 min deep breathing practice daily
- Mindful eating practice

4**. Exercise** –
- Nothing at this point due to pain, fatigue, tachycardia with exertion

Results – after 6 Months Work

- **States her IBS is 'great**'!
  - Having 2 normal BM's daily without debilitating symptoms afterwards
- **Energy much improved**
  - Thinking about going back to school
  - Able to paint all day long!
- **Symptoms assessment** – improved 70% since started working together (head, heart, GI, joints/ muscles, neuro)
  - Periods better, but still taking some Tylenol x 2 days
- **Doing short Tai Chi** practice in the evening + getting 2-4K steps daily
- Bedtime 11-11:30P, however still sleeping in to 9:30-10A

Results - after 1 year, 10 Months Work

- **Symptoms assessment improved 84%** since we started our work together
  - Energy is 'great'!
  - Periods are no longer problematic – last cycle was during Mother's Day & long photo shoot & only needed 1 Tylenol
- **Exercise** – walking daily + carrying heavy canvas artwork throughout the day
- **Mindfulness** – meditation before bed & Tai Chi on occasion
- **Sleep** – bedtime closer to 11P & able to get up and function much earlier in AM
- **Diet** – has built her foundation of colorful, plant-based & nutrient balanced meals with omission of inflammatory foods for her (gluten, dairy, soy, eggs)

Wins

- A successful artist – painting all day long, driving all over TC to deliver to clients, full-day events on her feet with no need to recover the next day
- Engaging in all roles of being Maid of Honor for her sister's wedding whereas she missed out on all events like this just 12 mos ago
- Only on 1 medication now

Summary & Conclusions

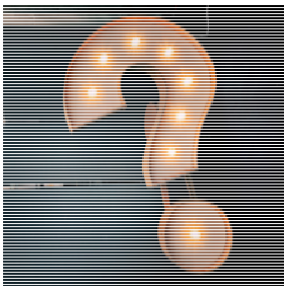
Summary & Conclusions

- **Whole, unprocessed foods**
  - No labels or minimal ingredients you can identify
  - Organic (if able) for animal-based products & Dirty Dozen produce
- **Colorful, plant-based diet** – the rainbow (more fiber)
  - Vegetables > fruit, legumes, nuts/seeds, whole grains
- **Balanced meals** – 50% colorful plants + high quality protein + healthy fats
- **Healthy fats** – NO trans fat & limit saturated fat
  - EVOO, nuts/seeds, olives, avocado, wild-caught fatty fish
  - Fish 2-3x/wk, some pastured poultry & eggs, less red meat
- **Limit sugar**

Summary & Conclusions

1. **Basic Nutrition Foundations** – on previous slide
2. **Elimination Diet** – impart help of Registered Dietitian
   - Many variations possible
   - At least, no cow dairy & gluten
3. **Mediterranean way of eating**

Q & A



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