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# Dietary Considerations for the Rehab Professional

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## Learning Outcomes

After this course, participants will be able to:

- Name at least three components of an anti-inflammatory diet.
- Discuss the differences between soluble and insoluble fiber and name at least 3 foods that fit into each category.
- Identify at least three insoluble and soluble fiber foods each.
- Describe the benefits and limitations of at least four common supplements that could be recommended to patients.
- Describe the components of appropriate hydration, including strategies for helping patients titrate their hydration as needed.

# Nutrition

- Is it in our scope of practice?
  - APTA: http://www.apta.org/PatientCare/Nutrition/
    - Yes, so long as your state allows it
  - NATA: https://www.nata.org/practice-patient-care/health-issues/nutrition
  - AOTA-no position statement
  - State practice acts-vary widely

# Why Should We Care About Nutrition?

- Put simply: nutrition impacts muscle performance, healing, and overall bodily health!

> Diet and nutrition are key components of many conditions managed by physical therapists. What's more nutrition can directly affect recovery and function while an individual is under a physical therapist's care.

APTA

> Dietary energy (energy that comes from food) not only supports athletic performance but also sustains life. Following an athlete's participation in exercise, whatever remaining fuel left in their body is used to support the body's metabolic processes. Thus, when an athlete's body is not adequately fueled, there is little energy left to support the body's critical functions following intense training, such as recovery and repair.

NATA

## When do we Refer Out?

- Considerations:
  - Personal scope of practice (knowledge base)
  - Are there accessible resources out there with the information you need?
  - Do the client/patient's needs fall outside of your comfort level and easily available resources?
  - Does the person need a very individualized approach or a lot of meal planning?
  - Essentially: if the person would benefit from generalized wellness/nutritional/supplementation advice and it is in your knowledge base or easily accessible, you can handle it. If not, refer!

## Nutritional Red Flags

- Eating disordered behavior
  - Female athlete triad
  - Anorexia, bulimia, orthorexia, binge eating, overly restricting food categories, body dysmorphia
- Abuse of supplements or pills in attempt to get a quick fix for weight or muscle bulking purposes

# Nutrition Terms

- Micronutrient-vitamins, minerals, and electrolytes
- Macronutrient-protein, fat, carbohydrate
  - http://nationalacademies.org/hmd/~/media/Files/Activity%20Files/Nutrition/DRI-Tables/8_Macronutrient%20Summary.pdf (acceptable macronutrient distribution ranges)
- Nutrient dense-food that has maximal nutrients per number of calories
- Antioxidant-found in food, defend cells from damage from free radicals
- Calorie-unit of energy; food calories are actually kilocalories (1,000 calories); 1 calorie is the amount of energy it takes to raise 1 g of water by 1 deg C
- Blood glucose-amount of sugar (energy) available for quick use
- Electrolyte-minerals in body fluids; include sodium, potassium, magnesium, and chloride

# Common Diets

- Paleo-diet based on foods that may have been available during prehistoric times
  - Belief: human body is not evolved to match foods available now due to farming practices
  - Avoid: grains, processed foods, legumes, dairy, salt, sugar, potatoes
- Ketogenic (keto)-low carb, high fat plan
  - Standard: 75% fat, 20% protein, 5% carbs
  - Cyclical: periodic carb re-feeds
  - Targeted: allows addition of carbs around workouts
  - High protein: 60% fat, 35% protein, 5% carbs
  - Atkins is similar but without the specific fat/protein ratio

## Common Diets

- Intermittent fasting
  - Alternating cycles of eating and fasting
  - Popular methods:
    - 16/8 or 23/1
    - Eat-stop-eat: 24 fast 1-2 days per week
    - 5:2: during 2 days a week, eat 500-600 calories
- Protein shake replacements
  - Component of many diet plans, can lead to constipation/inflammation
- Weight watchers
  - Point based system (based on calories)
  - Support groups/group weigh ins

## Common Diets

- Elimination
  - Diagnostic to attempt to identify irritants
  - Gluten free, dairy free
- The Zone
  - Goal: control insulin
  - 40% carbohydrates, 30% protein, 30% fats
- Vegetarian
  - Do not eat animal-based foods, with some exceptions
  - Ex: lacto-ovo-vegetarian, pescatarian, etc.
- Vegan
  - Do not eat or use any animal based products of any type

## Common Diets

- South Beach
  - Recommends avoiding foods based on glycemic index (determined by how quickly the food is digested/broken down)
- Standard American
  - Often high in sugar and fried foods and low in protein and fiber
- Raw food
  - Food should be completely unrefined, completely plant based, ideally organic
  - 75% of food should be uncooked

## Anatomy & Physiology of the Gastrointestinal System

How the heck does digestion work??

## Upper GI Tract

- Mouth, esophagus, stomach, duodenum
- Main function: Break food down into digestible units
- Mouth and Esophagus:
  - Mouth breaks down food mechanically (chewing) and via the use of saliva which contains digestive enzymes; food is formed into a bolus (soft ball) which is then swallowed
  - Esophagus carries food from mouth to the stomach

## Stomach

- Main purpose: secretion of gastric juices to further break down food into liquid which can be passed into the intestines for absorption.
- Sphincter at top and bottom which are intended to be one way valves, but can reflux at times

CONTINUED

# Duodenum

- Receives secretions from the gallbladder, liver, and pancreas and continues the digestive process, breaking food particles down further – chemical digestion is completed here (the food bolus is now a liquid called chyme)
- Beginning point of peristalsis

CONTINUED

# Jejeunum

- Approximately 2.5 m long
- Segmentations (localized contractions in walls of jejunum) circulate chyme/chemically digested food for maximal contact with walls of jejunum
- 90% of nutrient absorption occurs here

## Ileum

- No clear point of transition between jejunum and ileum, but tissue slowly transitions through a zone
- About 3.5 m long
- Remaining digestion occurs here
- Terminal ileum-just before iliocecal valve, chime is stored here before being passed into the large intestine

## Large Intestine

- Absorbs water and vitamins while converting chyme into stool
- Movement within the large intestine is mostly controlled by peristalsis (in turn regulated by speed of movement of iliocecal valve), usually slow/steady but can be more forceful after a large meal or during a sickness (this usually feels like cramping)
- Cecum-good bacteria are mixed with the chyme; These bacteria digest substances in chyme that the human body cannot absorb, turning them into stool and vitamins (K and B vitamins are almost entirely made bioavailable by these bacteria)

## Large Intestine

- Ascending colon
  - Bacterial digestion and vitamin/water absorption
- Transverse colon
  - Stool formation occurs here via segmentation; continued water and vitamin absorption
- Descending colon
  - Final water/vitamin absorption; final feces formation and storage (primarily fecal formation and storage)
- Rectum
  - Final storage point of fecal matter before it exits the body
  - Distension of the rectum stimulates stretch receptors in the rectal wall to send signal to the brain; this generates the urge to pass a bowel movement

## GI System Red Flags

- Black, tarry blood in stool
- Inability to pass stool for multiple days
- Vomiting bile or vomiting that can't be controlled
- Sudden unexplained weight change
- Sharp/acute pain in abdomen or pelvis
- Lack of appetite
- Anemia with no other explanation, not responsive to iron supplementation

# Hydration

# Importance of Water

- 60-75% of adult body weight
- Inputs
  - Fluid intake (70-80%)
  - Food intake (20-30%)
  - Water produced via oxidation of macronutrients (250-350 mL/day in sedentary adults)
- Outputs (adults)
  - Evaporation through the skin (450 mL/day)
  - Evaporation through respiratory tract (250-350 mL/day)
  - Feces (200 mL/day)
  - Urine (800-2000 mL/day)

## Physiologic Water Function

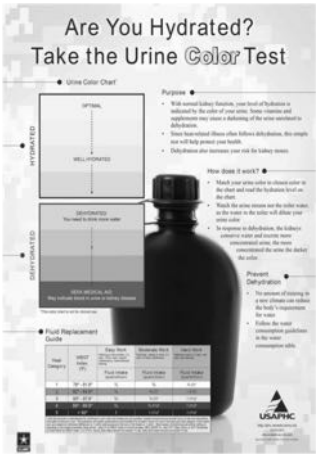
- Growth
- Digestion (solvent for ionic compounds, hydrolysis of macronutrients
- Carrier for nutrition and waste
- Thermoregulation (decreases speed of total body temperature changes)
- Lubrication
- Shock absorption
- Tissue function (organs, muscles)

## How Much $H_2O$?

- …It depends!
- Some possible variables:
  - Activity level
  - Climate (heat, humidity)
  - Sweat level
  - Pregnancy
  - Breastfeeding
  - Altitude
  - Illness
  - Age (older adults may lose sensation of thirst)
  - Normal hydration levels

## Recommendations for Start Point

- Jequier et Constant: 1.5 L/day for sedentary adults
- Gandy: 2.5-3.3 L/day for men/2-2.3 L/day for women for moderate activity levels
  - Add 0.60-1.1 L/day if pregnant/breastfeeding
- Paraiso et Abate: 0.5 oz/lb of body weight
- Urine output color/volume




## What About Other Fluids?

- Maughan et al, 2016
  - Measured individuals who were currently well hydrated and not particularly active
  - Cumulative urine output does not change much for cola, diet cola, hot tea, cold tea, coffee, orange juice, sparkling water, or sports drink compared to water
  - Hydration was increased (based on urine output) for full fat and skim milk as well as an oral rehydration solution

## What About Other Fluids?

- "But I thought coffee dehydrated you??"
- The concern is not hydration status but more the influence of other substances in the drink
  - Caffeine
  - Sugar
  - Dyes

## Signs of Dehydration

- Dark output, small volumes
- "Tenting" of skin
- Dry mouth or other mucous membranes
- Fatigue or confusion
- Muscle weakness
- Loss of sweat or tears
- Depression
- Sunken eyes
- Thirst
- Post exercise weight loss

Skin Turgor, Courtesy, New England Journal of Medicine: https://www.nejm.org/doi/full/10.1056/NEJMicm1005144?query=TOC

## Medical Conditions

- Diabetes & some brain injuries
  - Can cause too much thirst/fluid intake
  - Can be managed with medication (desmopressin)
- Hypertension, congestive heart failure, renal failure
  - Fluid overload is a concern
  - Diuretics can assist but can also cause overwhelming volume of output

## Other Considerations

- Athletes-may need to replace electrolytes and fluids due to sweat volume
- Constipation
- Medications-most are titrated and studied assuming appropriate hydration levels
- Attempting major weight loss
- Urinary incontinence

## Adding Water

- How to titrate
- Tips & tricks
- Sense of thirst

## Fiber

## Dietary Fiber

- Definition-portion of plant derived food that our enzymes cannot break down (roughage)
- Recommended dosage-most studies say 90% of Americans are under this amount
  - 14 g/1000 kcal
  - 25 g/day-women
  - 38 g/day-men
  - Survey-average American eating standard American diet gets 12 g/day

## Dietary Fiber

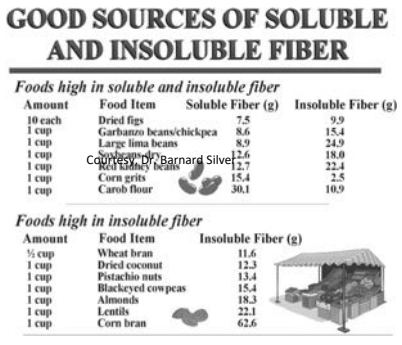
- 4 types
  - Insoluble, poorly fermented-does not dissolve in water, can exert laxative effect. Ex: bran fiber
  - Soluble, non viscous, readily fermented-gone completely once fermented, role unclear. Ex: Benefiber, legumes, rice
  - Soluble, viscous, readily fermented-forms a gel, increases chyme viscosity. Slows nutrient absorption, improves glycemic control/lowers cholesterol. Ex: oatmeal
  - Soluble, viscous, non fermenting-dissolves in water to form a gel, but is not fermented, so retains its gel quality throughout digestion, can adjust stool consistency, help with glycemic control/cholesterol. Ex: psyllium

# Reasons to Consider Fiber

- Constipation
  - Can be common in athletic population and pain population
  - Larger bowel movements are associated with lower risk of colon cancer, diverticulitis, appendicities
- Cardiovascular health
- Difficulty with nutrient absorption
- Patients with a goal related to weight management

# Adding Fiber

- Supplements vs food?
- Foods containing fiber
- How to titrate



**GOOD SOURCES OF SOLUBLE AND INSOLUBLE FIBER**

*Foods high in soluble and insoluble fiber*

| Amount | Food Item | Soluble Fiber (g) | Insoluble Fiber (g) |
|---|---|---|---|
| 10 each | Dried figs | 7.5 | 9.9 |
| 1 cup | Garbanzo beans/chickpea | 8.6 | 15.4 |
| 1 cup | Large lima beans | 8.9 | 24.9 |
| 1 cup | Soybeans dry | 12.6 | 18.0 |
| 1 cup | Red kidney beans | 12.7 | 22.4 |
| 1 cup | Corn grits | 15.4 | 2.5 |
| 1 cup | Carob flour | 30.1 | 10.9 |

Courtesy Dr. Barnard Silver

*Foods high in insoluble fiber*

| Amount | Food Item | Insoluble Fiber (g) |
|---|---|---|
| ½ cup | Wheat bran | 11.6 |
| 1 cup | Dried coconut | 12.3 |
| 1 cup | Pistachio nuts | 13.4 |
| 1 cup | Blackeyed cowpeas | 15.4 |
| 1 cup | Almonds | 18.3 |
| 1 cup | Lentils | 22.1 |
| 1 cup | Corn bran | 62.6 |

# Anti-Inflammatory Diet

Low FODMAP

# Inflammation

- Chemicals from white blood cells (cytokines) are released into the bloodstream/tissues to help stimulate immune response
- Chronic inflammation-chronic low level inflammation which can have systemic impact
  - Stressful for the body, has been linked to disease including heart disease, stroke, and cancer
  - Can be triggered by any perceived internal threat regardless of whether one actually exists
  - Can test for levels of C-reactive protein in the blood to help diagnose

## Leaky Gut Syndrome

- Increased intestinal permeability
- Not all medical professionals recognize it as legitimate despite evidence that hyperpermeability exists
- Increased permeability allows bacteria and toxins to leak back into the bloodstream, resulting in systemic inflammation
- Cause unknown, known associations include: excessive sugar intake, excessive alcohol intake, long term NSAID use, nutrient deficiency, overgrowth of candida, stress

## Leaky Gut Syndrome

- Known associated diseases include diabetes, celiac, Crohn's, irritable bowel syndrome, food allergies
- There may be neural "cross talk" leading to pelvic pain, abdominal bloating, etc.

## Ginger

- Has been reported to have anti-inflammatory effects via inhibition of inflammatory chemicals (specifically COX-2, NF-KB, 5-LOX)
- Shown to have anti-inflammatory and analgesic effects in the following populations:
  - Osteoarthritis
  - Dysmenorrhea
  - Rheumatoid arthritis
  - Chronic low back pain

## Low FODMAP Diet

- Fermentable Oliosaccharides, Disaccharides, Monosaccharides, and Polyols-all short chain carbohydrates thought to promote inflammation
- Research suggests some bodies do not absorb these foods well, leading to inflammation (gas, extra fluid) in the gut as well
- 2 phase intervention
  - Phase 1: strictly reduce or eliminate FODMAP foods
  - Phase 2: reintroduce one at a time to analyze whether the person is reacting

## FODMAP Foods

- Poorly absorbed in the gut
- Small, osmotically active molecules which increase the liquidity of luminal (gut) contents
- Rapidly fermented by bacteria
- Can cause GI symptoms (bloating, gas, loose stool) or may be asymptomatic but with increased inflammation

## FODMAP Foods

- https://www.ibsdiets.org/fodmap-diet/fodmap-food-list/
- Most irritating foods: Coffee/tea, soda, alcohol, citrus, tomatoes, spicy food, sweeteners
- Least irritating foods: Water, milk, vegetables, animal proteins, bland carbohydrates
- Categories to avoid: nightshade vegetables, processed foods, sugar, dairy, grains, fruits (especially fruits with a stone), legumes, alcohol

## Who Might Benefit?

- Individuals with the following conditions might consider a low FODMAP or other elimination diet:
  - IBS
  - Autoimmune diseases
  - Chronic pain
  - Digestive problems
  - Food allergies

## Implementing the FODMAP Diet

- Track foods and symptoms for a week without changing anything
- For 2-4 weeks follow FODMAP recommendations while still tracking symptoms
- Reintroduce foods 1 at a time (at least 3 days between food introductions) to assess body's response and determine what works for long term
- Concerns: difficulty with implementation, patients with eating disorders

# Supplements

## Supplements

- Convenient way to add nutrients that may be deficient in the person's diet
- Is there a true deficiency?
- Water vs fat absorbed
- Some may interact with medications the patient is taking

## Magnesium

- Amount ingested in typical western diet has dramatically declined
- Multiple impacts on the body, including:
  - Bone metabolism
  - Parathyroid regulation
  - Muscle activity (skeletal and smooth)
  - Nerve transmission & neuromuscular transduction
  - Cardiac activity
  - Blood pressure regulation
  - Ratio of calcium and magnesium seem to be related to risk of cardiovascular events
  - Anxiety symptom alleviation

## Magnesium

- Who should not take it?
  - Those with cardiac arrhythmias
- Can be absorbed through the skin
- Present in foods
  - Leafy green vegetables (dark)
  - Beans
  - Nuts
  - Seeds
  - Fish
  - Whole grains
  - Dairy

# Calcium

- May be combined with vitamin D for treatment of bone density issues or non healing fractures
- Should be taken in small quantities (500 mg) at a time for maximum absorption
- Those with cardiac issues should be physician guided

| Calcium Carbonate | Calcium Citrate |
|---|---|
| Easily available | More expensive |
| Relies on stomach antacids/better taken with food | Can be taken with or without food |
| | Recommended for people with inflammatory bowel disease |

# Vitamin D

- Insufficient amounts can decrease calcium absorption, leading to osteoporosis, osteopenia, rickets
- Fat absorbed
- People with bowel dysfunction (Crohn's, IBD) and people with vitamin malabsorption are at risk for vitamin D deficiency
- Institute of Medicine: vitamin D repletion is accomplished with 20 ng/mL per day
- High doses may improve immune function

## Prebiotics

- Food the human body can't digest
  - Serves as food for probiotics
  - Increases surface area for beneficial bacteria
  - Improve calcium absorption
  - May reduce risk of colon cancer
- Found in fiber rich foods
  - Raw asparagus
  - Raw garlic
  - Raw bananas
  - Artichoke
  - Onions
  - Dandelion greens

## Probiotics

- Tiny living microorganisms (includes bacteria and yeast)
- Found in fermented foods
- Should be taken 1-2 times per day
  - Start with 30-50 billion CFUs (colony forming units)
- Benefits:
  - Digestive health especially post antibiotic use
    - Multiple studies support improvement in bowel related syndromes with prebiotic use
  - May help alleviate symptoms of depression
  - Immune system benefits

## Probiotics

- 3 main components of probiotics/bacterial support
  - Lactobacillus-primarily populates small intestines
    - Digestive support & immune function, depression/anxiety
  - Bifidobacteria
    - Live in large intestine, absorbed by the body to help regulate insulin; help prevent colon cancer, control body mass, reduce IBD
  - Saccharomysis
    - Yeast that helps protect gut lining

## Probiotic Selection

- Probiotic supplementation is not one size fits all
  - Some studies have shown worsening of autoimmune disorders such as Crohn's with specific probiotics
  - Patients with SIBO (small intestinal bacterial overgrowth) or candida are not good candidates
  - Signs of intolerance: bloating, constipation, diarrhea (that stops when the person stops taking it), anxiety
- Should contain live/active cultures
- Millions of colony forming units (CFUs) is best!
- Look for diversity of strains
- Look for a professional brand due to quality control issues

## Fish Oil

- Used to increase omega-3 fatty acids in diet
- Up to 3 grams per day is considered safe (not necessary if the person eats fish regularly)
- Benefits may include:
  - Lower blood pressure
  - Reduce triglycerides
  - Slow development of arterial plaque
  - Decrease likelihood of abnormal cardiac rhythms
  - Reduce likelihood of cardiac disease

## Fish Oil

- Who should not take it?
  - More than 3 grams per day may increase risk of bleeding
- Undesired side effects
  - Fishy breath
  - Upset stomach
  - Loose stools
  - Nausea

# Folate

- Water soluble B vitamin
  - Can be called folacin or vitamin B9
- Folic acid-fully oxidized form, converted by the body into usable form
- MTHFR
- Folate is found in
  - Leafy green vegetables
  - Beans, peas, lentils
  - Fruits, including bananas and melons
  - Eggs

# Folate

- Folic acid supplements are more easily bioavailable when not taken with food
- Isolated folate deficiency is rare in the US, but symptoms include megaloblastic anemia, tongue ulcerations, GI symptoms, changes in pigmentation of skin/hair/nailbeds

| Age | Male | Female | Pregnancy | Lactation |
|---|---|---|---|---|
| Birth to 6 months* | 65 mcg DFE* | 65 mcg DFE* | | |
| 7–12 months* | 80 mcg DFE* | 80 mcg DFE* | | |
| 1–3 years | 150 mcg DFE | 150 mcg DFE | | |
| 4–8 years | 200 mcg DFE | 200 mcg DFE | | |
| 9–13 years | 300 mcg DFE | 300 mcg DFE | | |
| 14–18 years | 400 mcg DFE | 400 mcg DFE | 600 mcg DFE | 500 mcg DFE |
| 19+ years | 400 mcg DFE | 400 mcg DFE | 600 mcg DFE | 500 mcg DFE |

*micrograms daily folate equivalent

## Glucosamine & Chondroitin

- Structural components of joint cartilage produced naturally in the body
- Often taken to help with joint pain/arthritis
- May interact with blood thinners (especially warfarin)
- There is not strong research to suggest that these are effective

## Athletes & Nutrition

## Nutritional Needs of Athletes

- Needs to address increased energy demands and muscle damage caused by training
- Consider type of athlete and goals when determining nutritional plan
- Ensure eating adequate amount, especially in sports where a certain body type is desired
- Female athlete triad

## Macronutrients & Athletes

- Carbohydrates-primary source of energy during high demand activities
  - "Carb loading" prior to event or heavy training session
  - Sources: fruits, vegetables, whole grains
- Dietary fat-helps with hormonal regulation and long term energy needs
  - "Slow burn" fuel
  - Sources: avocado, nuts, olive/coconut oils
- Protein-key role in muscle repair and growth
  - Sources: meat, eggs, dairy, legumes

## Athletes & Hydration

- 2% drop in hydration status has measurable impact on muscle performance
- Best practice: drink prior to training or event, then 4-6 oz of fluid every 15 minutes of heavy exercise
- Hydration status the day before an event may impact event performance even more than hydration status the day of

## Nutrition for Injury Recovery

- Goals: decrease inflammation, provide nutritional building blocks for tissue healing, minimize muscle atrophy
- First 48 hours
  - Trauma or surgery may consume up to 20% more calories than baseline
  - Use of crutches requires 2-3 times as much energy as walking
  - If nutritional intake falls to 80% or less of what is needed for 10 days, it can delay muscle synthesis by up to 20%

# Nutrition for Injury Recovery

- Muscle preservation
  - Atrophy can be the effect of immobilization or forced break from training
  - Increase protein to 1.6-2.5 g/kg/day
  - Consume foods high in leucine (amino acid that helps combat anabolic resistance)
    - Cheese, meat, fish, nuts, seeds
  - Consuming protein/leucine regularly during waking hours provides steady stream of nutrients for muscle building

# Nutrition for Injury Recovery

- Inflammation
  - Consume foods high in antioxidants
    - May also decrease adhesion formation post surgery
    - Goji berries, blueberries, tart cherries or tart cherry juice, pecans, green tea, artichoke, blackberries, kidney beans
  - Herbs shown to decrease inflammation
    - Garlic, turmeric, ginger
  - Eat anti-inflammatory fats
    - Olive oil, avocado, fish, flax, nuts, seeds
  - Avoid pro-inflammatory fats
    - Fried food, canola oil, vegetable oil, processed meats

## Injury Specific Nutritional Support

- Concussion
  - Protein/calorie rich snack as soon as possible after removal from play
  - Increase intake of Omega 3 fatty acids during recovery
- Bone injury
  - 1,500 grams of calcium per day
  - Optimize intake of vitamins D, K2, & mineral phosphorous to improve absorption
- Soft tissue injury
  - Increase intake of copper, protein, leucine
  - Upon return to training, consume 15 g gelatin/50 mg vitamin C an hour before training

## Athletes & Dietary Supplements

- May be called ergogenic aids
- Marketed to improve exercise performance, increase endurance, improve tolerance for intense training, enhance recovery from exercise
- Commonly used by athletes in the US, especially in endurance & muscle bulking sports
- Sold in tablet, liquid, capsule, bar, and powder forms
- Common ingredients: amino acids, protein, caffeine, creatine

## Athletes & Dietary Supplements

- Do they help?
  - Mixed evidence
  - Current studies have short durations & low numbers
  - Most research has only focused on single components of athletic supplements, making it hard to know how the ingredients taken together will behave
  - They seem most helpful when they add to proper nutrition & hydration (vs being used as a replacement)
  - Excellent evidence summation available here: https://ods.od.nih.gov/factsheets/ExerciseAndAthleticPerformance-HealthProfessional/

## Athletes & Dietary Supplements

- Safety concerns
  - Lack of research demonstrating component interaction
  - Commonality of adulterated products
    - Most common in products marketed for muscle building
  - Possible interactions with medications
    - Iron containing supplements can decrease bioavailability of medications used to treat hypothyroidism

## Anabolic Steroids

- Androgens (testosterone & related hormones) which are known to increase protein within cells, which can lead to faster muscle bulking
- Illegal in college & professional athletics
- Can be used therapeutically to treat low appetite, muscle wasting from diseases, induce puberty, provide treatment to transgender individuals
- Long term negative side effects: change in cholesterol levels, acne, high blood pressure, liver damage, cardiac damage, testicular size reduction, masculinization of females

## Diet and Hormones

## Calcium, Magnesium, & Female Hormones

- Charandabi (2017) studied the effect of calcium and magnesium versus calcium alone on pain intensity in subjects with primary dysmenorrhea. The results showed that taking calcium alone or combining it with magnesium reduced menstrual pain and rest length due to the pain as well as reduced number of analgesics taken. The effectiveness was greater with combination of calcium and magnesium compared with taking calcium alone.

## Fiber & Estrogen

- Potential impact on estrogen for patients with endometriosis
  - Soluble fiber binds to estrogen and can remove excess from the body (may not be good in menopausal patients)
  - Can also bind to/remove calcium as well

## Phytoestrogens

- Plant derived compounds thought to mimic the effects of estrogen in the body
- Very mixed research
  - Touted health benefits include decreased risk of osteoporosis, heart disease, breast cancer, and menopausal symptoms
  - They are considered an endocrine disruptor and may suppress estrogen that is in the body, may interfere with development, and may suppress sexual behavior or cause aggression
  - Some researchers believe the amount found in food is unlikely to cause significant systemic effects

## Phytoestrogen Sources

- Soy
  - All forms, including tofu, soy milk replacement products, and tofu
- Broccoli
- Carrots
- Coffee
- Licorice root
- Tea
- Oranges

## Foods to Boost Testosterone

- Eat foods that are rich in testosterone precursors
  - Vitamin D and zinc
- Limit phytoestrogen intake
- Possible options:
  - Tuna
  - Egg yolks
  - Oysters
  - Shellfish
  - Beef
  - Beans

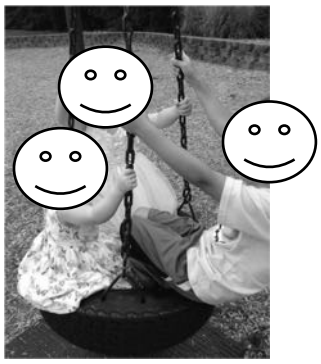
## Thyroid Support

- Low thyroid:
  - Eat:
    - Iodine (fish, seaweed, dairy, eggs)
    - Selenium (tuna, sardines, legumes, green beans)
    - Zinc
  - Avoid
    - Goitogens (soy containing foods, fruit/starchy)
    - Gluten (if autoimmune issues or celiac)
    - Highly processed foods
    - Millet
    - Too much caffeine can inhibit thyroid function

## Thyroid Support

- Hyperthyroidism
  - Eat:
    - Calcium sources (such as dairy)
    - Berries and other antioxidant rich foods
    - Cruciferous vegetables (goitogens)
    - Foods high in vitamin D, healthy fats, and protein
  - Avoid:
    - Caffeine
    - Foods that your body has a sensitivity to

## Personalizing Your Dietary Advice



# Establish Baseline

- Use of intake/output diaries to establish baselines & look for triggers
  - Note: these may be triggering to individuals with eating disorders
  - Paper
  - Apps
    - Calorie Counter & Food Diary
    - MyFitnessPal
    - MyPlate
    - Fitocracy Macros

| | Sunday | Monday | Tuesday | Wednesday | Thursday | Friday | Saturday |
|---|---|---|---|---|---|---|---|
| 6:00 AM | | | | | | | |
| 7:00 AM | | | | | | | |
| 8:00 AM | | | | | | | |
| 9:00 AM | | | | | | | |
| 10:00 AM | | | | | | | |
| 11:00 AM | | | | | | | |
| 12:00 PM | | | | | | | |
| 1:00 PM | | | | | | | |
| 2:00 PM | | | | | | | |
| 3:00 PM | | | | | | | |
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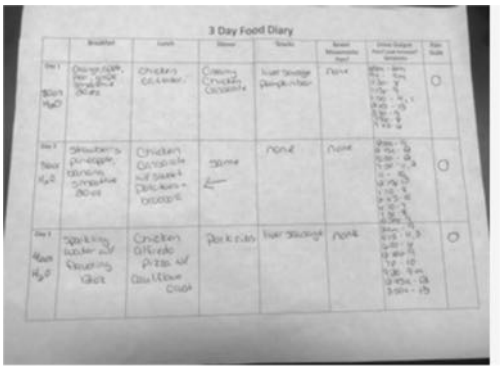
| 11:00 PM | | | | | | | |
| 12:00 AM | | | | | | | |
| 1:00 AM | | | | | | | |
| 2:00 AM | | | | | | | |
| 3:00 AM | | | | | | | |
| 4:00 AM | | | | | | | |
| 5:00 AM | | | | | | | |

# Example Food Log



CONTINUED

# Example Fluid Log

**Patient:** 45 year old female with 5-year history of increasing UI symptoms

**Date:** _____ **Date:** _____

| | Urinate in toilet | Amount of leak / accident | Activity during leak | Drink type/ amount | | Urinate in toilet | Amt of leak / accident | Activity during leak | Drink type/ amount |
|---|---|---|---|---|---|---|---|---|---|
| 6 AM | | | | | 6 AM woke | 6 oz | sm | Going to bathroom | |
| 7 AM woke | 10 oz | | | 8 oz coffee | 7 AM | | | | |
| 8 AM | 2 oz | | | 4 oz juice | 8 AM | 8 oz<br>2 oz | | | 16 oz coffee |
| 9 AM | 1 oz | sm | water | | 9 AM | 2 oz | sm | ?? | |
| 10 AM | | | | 16 oz coke | 10 AM | | | | |
| 11 AM | 3 oz | | | | 11 AM | | | | |
| 12 AM | 1 oz | | | 4 oz water | 12 AM | 5 oz | med | Wait too long | 16 oz coke |
| 1 PM | | | | 8 oz tea | 1 PM | 3 oz | | | 8 oz water |
| 2 PM | 4 oz | med | Arriving home | | 2 PM | 1 oz | | | |
| 3 PM | | | | | 3 PM | | | | |
| 4 PM | | | | | 4 PM | 3 oz | | | |
| 5 PM | 6 oz<br>2 oz | Sms | Wait too long | | 5 PM | 4 oz | | | |
| 6 PM | 2 oz | | | 16 oz coke | 6 PM | | | | 8 oz wine<br>8 oz coffee |
| 7 PM | | | | | 7 PM | 6 oz | sm | Arriving home | |
| 8 PM | 4 oz | | | | 8 PM | 2 oz | | | |
| 9 PM | 2 oz | | | 4 oz water | 9 PM | | | | |
| 10 PM | 3 oz bed | | | | 10 PM | 4 oz<br>2 oz | | | 4 oz water |
| 11 PM | | | | | 11 PM | bed | | | |
| 12 PM | | | | | 12 PM | | | | |
| 1 AM | 4 oz | | | | 1 AM | | | | |
| 2 AM | 2 oz | | | | 2 AM | | | | |
| 3 AM | | | | | 3 AM | 7 oz | | | |
| 4 AM | | | | | 4 AM | | | | |
| 5 AM | | | | | 5 AM | | | | |
| Total | 14 x 46 oz | 2 sm<br>1 med | | 60 oz, 48 oz, irr | Total | 14 x 55 oz | 3 sm<br>1 med | | 60 oz. 48 irrit. |

Number of pads used: 2 Number of pads used: 2

CONTINUED

# Example Intake/Output Log

| Time of Day | Type & Amount of Food & Fluid Intake | Amount Voided Ounces, S / M / L or Seconds | Amount of Leakage S /M /L | Was Urge Present 1 /2 /3 | Activity With Leakage |
|---|---|---|---|---|---|
| Midnight | | | | | |
| 1:00 AM | | | | | |
| 2:00 AM | | | | | |
| 3:00 AM | | | | | |
| 4:00 AM | | | | | |
| 5:00 AM | 8 oz water with Diflunisal, hypertiotics 2 tablets, NeilMed sinus rinse, aller Flo | 14 oz | M - pad was soaked for 4 1/2 inches | 1 | sleep |
| 6:00 AM | 8 oz black coffee | BM, strong urge, could not control, happened quickly | | 3 | working on this chart |
| 7:00 AM | | | | | |
| 8:00 AM | 8 oz black coffee | BM weak urge, but when I went, accidently urinated at same time | | 1 | working on this chart |
| 9:00 AM | 2 scrambled eggs, 1 thick sliced bacon, 3 slices tomatoes, 1 serving grits, 8 oz whole milk | | | 1 | ate at 9:30 |
| 10:00 AM | | 4 oz | | 1 | 9:45 AM |
| 11:00 AM | | | | | |
| 12:00 PM | 8 oz water | | | | |
| 1:00 PM | | | | | |
| 2:00 PM | 1 panfried pork chop | | | | |
| 3:00 PM | 8 oz black coffee | | | | |
| 4:00 PM | 6 crackers w ham,cheese | 11 oz | none | 3 | on phone |
| 5:00 PM | 1 small burrito, sugar peas, pearl onions, 8 oz water | | | | |
| 6:00 PM | | | | | |
| 7:00 PM | | | | | |
| 8:00 PM | 4 oz brandy | 8 oz | none | 1 | |
| 9:00 PM | exerises, 10 oz water | | | | |
| 10:00 PM | | | | | |
| 11:00 PM | | 16.5 oz | 5 | 3 | sleep |
| 12:00 AM | | | | | |

| Time of Day | Type & Amount of Food & Fluid Intake | Amount Voided Ounces, S / M / L or Seconds | of Leakage S /M /L | Was Urge Present 1 /2 /3 | Activity With Leakage |
|---|---|---|---|---|---|
| Midnight | | | | | |
| 1:00 AM | 12 oz water | 18 oz, missed collector and peed on floor about 2 oz, then sat on commode, pred in commode, maybe a total of 22 oz | pad was soaked from end to end, major leakage | 3, gushed urine as soon as I stood up, could not stop, major disaster | sleep |
| 2:00 AM | | | | | |
| 3:00 AM | | | | | |
| 4:00 AM | | | | | |
| 5:00 AM | | | | | |
| 6:00 AM | | | | | |
| 7:00 AM | 8 oz water with Diflunisal, hypertiotics 2 tablets, NeilMed sinus rinse, aller Flo | 13 oz | none | 1 | sleep |
| 8:00 AM | 8 oz black coffee | | | | |
| 9:00 AM | | | | | |
| 10:00 AM | 1 fried egg, 1 piece fried spam, half serving hash browns, 8 oz black coffee | | | | |
| 11:00 AM | | | | | |
| 12:00 PM | 1 fried egg, 1 piece fried spam, half serving hash browns, 8 oz milk | 8 oz | none | 1 | on computer |
| 1:00 PM | | | | | |
| 2:00 PM | | 8 oz | none | 1 | getting ready to go ou |
| 3:00 PM | | | | | |
| 4:00 PM | | | | | |
| 5:00 PM | 8 oz white wine, 8 oz prime rib, sweet potato, asparagus, 8 oz water | | | | |
| 6:00 PM | | | | | |
| 7:00 PM | 4 oz brandy | 8 oz | none | 1 | |
| 8:00 PM | | | | | |
| 9:00 PM | | | | | |
| 10:00 PM | 4 oz water | 16 oz | none | 1 | sleep |
| 11:00 PM | 11:37 PM, 4 oz | 17 oz | | 2 | sleep |

CONTINUED

## Consider Goals

- In conjunction with overall body/health status & individual's history
  - Pregnant? Breastfeeding? Growing?
  - History of constipation? Eating disorder?
- Consider referral to nutritionist if your client wants a comprehensive plan
- Encourage transparent reporting back and be open to listening and adjusting if the results are not the desired ones
- Educate! There is no one size fits all/most

## Great Additional Resources

- National Institutes of Health fact sheets for healthcare professionals: https://ods.od.nih.gov/
- Jessica Drummond, PT: https://integrativewomenshealthinstitute.com/about/founder/

# Questions?

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