

# Fighting Inflammation with Nutrition

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# Objectives

- What is inflammation?
- Diseases that result from inflammation and identify the markers for inflammatory diseases
- Main risk factors for developing inflammation
- Diet's role in reducing inflammation
  - Top inflammatory foods
  - Top anti-inflammatory foods
- Meal planning to include anti-inflammatory meals

# What is Inflammation ?

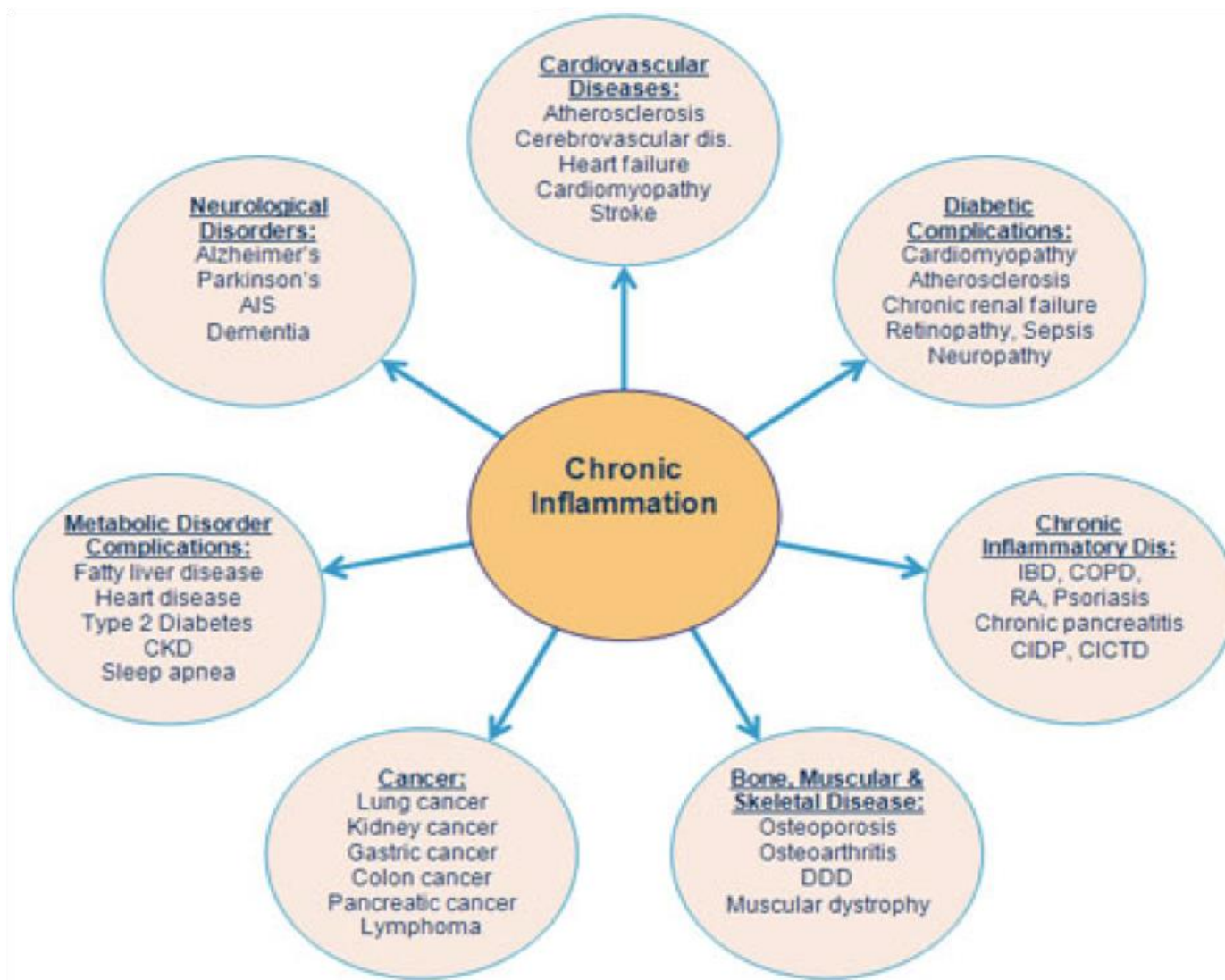
Inflammation is a body's natural response to injury or irritants.

White blood cells and chemicals are sent to the affected area to isolate and get rid of the problem. It is the first line of defense against disease

It can lead to “too much of a good thing” if there is no signal to let the immune system to stop - inflammation will continue to fight and even when the injury is gone and it starts to attack healthy tissue = chronic inflammation

# Chronic Inflammation vs. Acute

- Acute inflammation can help save your life but chronic inflammation can help end it
- Chronic inflammation occurs when the body fails to end the inflammatory cycle, the body turns on itself leading to increased risk of other diseases/illness



# Symptoms of Inflammation

- weight gain, fluid retention, fatigue, brain fog, irritable bowel syndrome, mood problems, headaches, sinus and nasal congestion, joint pains, acne, and eczema

# Best Markers for Inflammation

- C-reactive protein (CRP) is a protein in the blood and the best indicator of inflammation. When levels of CRP rise so does inflammation.
- According to The American Heart Association and the Centers for Disease Control and Prevention, a CRP concentration of  $< 1.0$  mg/L indicates low risk for heart problems; between 1.0 to 3.0 mg/L is an average risk for heart problems;  $> 3.0$  mg/L as high risk for heart problems.
- Very high levels of CRP (more than 10 mg/L) can also indicate impaired immune response or inflammatory disease.
- Elevated CRP more accurate than cholesterol in predicting heart attack risk

# Best Markers of Inflammation

- White blood cells (WBC) – play a big role in your immune system. WBC are always on the lookout searching the blood for invading viruses, bacteria, and fungi.
- WBC fight off infection before it can cause disease
- A high WBC count indicates something is not right and can be infection, stress, inflammation, trauma, allergy, or certain diseases
- WBC > 10,500 leukocytes in a microliter of blood in adults is high, while 4,500-10,500 WBC is within the normal range.



# Best Markers of Inflammation

- Low Vitamin D levels
- Studies have shown that this sunshine vitamin can play a role in reducing inflammation
- Each 10ng/ml increase in serum vitamin D is associated with a 25% reduction of CRP.
- Very hard to get vitamin D through diet so supplementing is needed – aim for 2000 IU daily

# What Can Cause Inflammation?

- **Poor diet--mostly sugar, refined flours, processed foods, and inflammatory fats such as trans and saturated fats**
- Overweight/Obese
- Lack of exercise - regular exercise reduces inflammation - improves immune function, strengthens your cardiovascular systems, corrects and prevents insulin resistance, improves mood and decreases effects of stress
- Stress/lack of sleep
- Hidden or chronic infections with viruses, bacteria, yeasts, or parasites
- Hidden allergens from food or the environment
- Toxins such as mercury and pesticides
- Mold toxins and allergens

# Main Dietary Culprits Resulting in Inflammation

## Dairy and Gluten

**Dairy** - two components of dairy that tend to cause issues for people: (1) the sugar – lactose and (2) the protein – casein .

Lactose intolerance affects more than 7 million Canadians. The protein in cow's milk called casein can be very inflammatory for some people.

The make up of the protein casein is different in sheep's and goats milk than cow's milk



# Dietary Culprits for Inflammation

- **Gluten** - protein composite found in several types of grains, including wheat, spelt, rye and barley.
- Gluten consists of two proteins gliadin and glutenin. Gliadin is the protein people react negatively to.
- Celiac disease (the most severe form of gluten sensitivity), is when the immune system attacks the gluten proteins, but it also attacks an enzyme in the cells of the digestive tract
- The immune reaction can cause damage to the intestinal wall, leading to nutrient deficiencies, various digestive issues, anemia, fatigue, failure to thrive
- In non-celiac gluten sensitivity, there is no attack on the body's own tissues. However, many of the symptoms are similar to those in celiac disease, including bloating, stomach pain, fatigue, diarrhea, as well as pain in the bones and joints.
- Gluten sensitivity is very hard to test for – need to restrict in diet

# Steps to Follow for Elimination Diet

- Avoid dairy and gluten for 3-4 weeks you can also avoid other foods that you may feel you are sensitive too (soy)
- Start a food diary. Keep track of the foods you eat, and what symptoms you are having.
- At the end of the elimination period, slowly re-introduce one food group at a time back into your diet. Pick one food group and eat foods containing that item on the first day. Don't eat the food for the next two days, but look for symptoms.
- If you experience symptoms → you have identified a food trigger. If your symptoms do not return, you can consider that food group to be non-reactive for you.
- Once you have a clear sense of whether one particular food group is a trigger for you, you are ready to repeat the three day process with the next food group

# Other Foods Leading to Inflammation

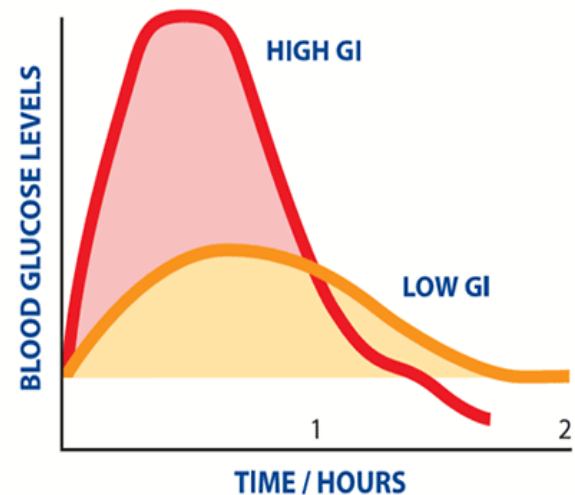
- Red meat
- Sugar
- Certain Oils/fats

# Red Meat and Inflammation

- **Processed Meats** - ↑ saturated fat, ↑ sodium and ↑ nitrates. During the cooking process, high-fat, high-protein animal foods also develop advanced glycation end products (AGEs), which contribute to inflammation. Limit red meat intake to 2x a week and pick leaner choices.
- Highest levels of dietary AGEs (dAGEs) are found in beef, pork, fish and eggs; even lean meats like chicken contain high levels of dAGEs when they are cooked with dry heat/high heat.
- Compared to other meats, lamb had the lowest levels of dAGEs.

# Sugar and Inflammation

- **Sugar** – refined sugar can weaken immune system
- Refined carbohydrates (high glycemic index) increases the level of CRP in our bodies
- Choose low glycemic foods
- Avoid artificial sweeteners



The amount of carbohydrate in the reference and test food must be the same.



# Glycemic Index

## Low GI Foods

- Apples
- Asparagus
- Beans
- Broccoli,
- Berries
- Cabbage,
- Cantaloupe, honeydew melon
- Citrus fruits,
- Green beans,
- Grapefruit
- Leafy greens, (kale, spinach)
- Pears

## High GI Foods

- Watermelon
- Bananas
- Dried fruit
- Pineapple
- Papayas
- Mangos
- Corn
- Potatoes
- Parsnips
- White rice
- Pasta
- White bread

# Oils / Fat and Inflammation

- Most omega-6 fats, found in margarine and corn and safflower oils, are the building blocks of arachidonic acid and prostaglandin E2, two of several key inflammation-causing substances in the body
- We do not get enough omega-3 fats in our diet so the balance of omega 3 to omega 6 are off, which can lead to inflammation
- Swap omega-6-laden soy, sunflower, corn, cottonseed, safflower and mixed vegetable oils with extra virgin olive oil, which is rich in omega-3 fatty acids. For higher-heat cooking or a more neutral taste, use organic expeller pressed canola oil (those sold in glass bottles are ideal).

# Foods that Fight Inflammation

- Leafy greens - vitamin E may play a key role in protecting the body from pro-inflammatory molecules called cytokines
- Nuts and seeds packed with antioxidants, which can help your body fight off and repair the damage caused by inflammation.
- Fatty fish (wild salmon, mackerel, trout, sardines)
- Healthy oils such as olive oil and avocado
- Low GI fruit such as strawberries, cherries, oranges and blueberries
- Spices (ginger, cinnamon, garlic, turmeric)
- Whole grains (quinoa, oats)

# Meal Planning –Breakfast Ideas

## Inflammatory

- 1 cup of cornflakes
- $\frac{3}{4}$  cup of cow's milk
- 1 banana
- Slice of toast with butter

## Anti-Inflammatory

- 1 cup of steel cut oats
- $\frac{3}{4}$  cup of unsweetened almond milk
- $\frac{1}{2}$  cup of blueberries
- 1 tbsp of chopped almonds
- 1 tsp of cinnamon
- 2 tsp of chia seeds
- Dash of maple syrup or honey

# Meal Planning - Lunch

## Inflammatory

- Turkey sandwich with cheese with mayonnaise
- Diet coke
- Chips

## Anti-inflammatory

- Grilled chicken salad (mixed in with mashed avocado and chopped veggies) in lettuce wraps
- Water or unsweetened iced tea
- 2 cups of air popped popcorn

# Meal Planning Dinner

## Inflammatory

- Meat samosa
- 2 cups of white rice
- Meat curry with potatoes
- Juice

## Anti-inflammatory

- Start meal with water based soup with vegetables
- 1 cup of brown rice
- Lentil curry
- Side of cucumber slices and cherry tomatoes
- Water

# Meal Planning - Snacks

- ¼ cup of nuts and seeds (homemade trail mix)
- Hard boiled eggs
- 1 cup of edamame
- Fruit (low GI)
- Veggies and hummus
- Nut butters
- ½ of an avocado

# Supplements

- Vitamin D - aim for 2000 IU
- Omega 3 at least 1000 mg of combined DHA and EPA
- Probiotic - may help your digestion and improve the balance of healthy bacteria in your gut, which reduces inflammation.



# Calcium Considerations

- Include 4 non-dairy sources of calcium each day.
- Select calcium-rich green vegetables every day such as broccoli, rapini, bok choy, Brussels sprouts, Chinese cabbage, kale, collards or mustard greens. One serving is 1 cup.
- Nuts, seeds and legumes such as chickpeas, black beans, almonds, and sesame seeds should be included daily. One serving is  $\frac{3}{4}$  cup of beans or  $\frac{1}{4}$  cup of almonds or 2 tablespoons of almond butter.
- Eat canned sardines or salmon with bones during the week.
- Also include a serving of a milk alternative such as soy or almond beverage; otherwise be sure to add a daily calcium supplement providing 300-500 mg.

# Questions?

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