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### Aging: The Impact of Diet and Inflammation

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# Aging: The Impact of Diet and Inflammation

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## Introduction

- *Inflammaging* is described as the progressive increase of pro-inflammatory cytokines and oxidative stress, which lead to changes and remodeling in the immune system (Frank & Caceres, 2015).
- It results in dysfunctional tissue repair which contributes to an individuals susceptibility to disability and mortality (Weyh et al., 2020).
- The chronic inflammatory changes that occur with inflammaging decrease the bodies ability to fight infection, disease and cancer (Wataad et al., 2019).
- Recent studies have attempted to understand the complexity of the aging process on the immune system as well as evaluate how lifestyle factors, including diet, can prevent the negative outcomes that are associated with inflammaging (Weyh et al., 2020).

## Chronic Inflammation and Disease

- Acute inflammation has notable signs and symptoms; swelling, redness, warmth and pain. Chronic inflammation is less understood and can be undetectable.
- Recent research confirms the link between dietary patterns and chronic inflammation (Bell et al., 2019).
- Inflammaging hinders the bodies' ability to prevent the onset of diseases, research suggests it may be the root cause of diseases that commonly arise with pathological aging (Ventura et al., 2017).

Such diseases include:

1. Dementia
2. Parkinson's disease
3. Atherosclerosis
4. Diabetes type 2
5. Sarcopenia
6. Cancer
7. Autoimmunity
8. Neurodegenerative diseases
9. Pulmonary conditions
10. Cardiovascular disease (Ventura et al., 2017).

- New evidence suggests chronic inflammation also exacerbates psychological disorders as well (Todd, 2019).

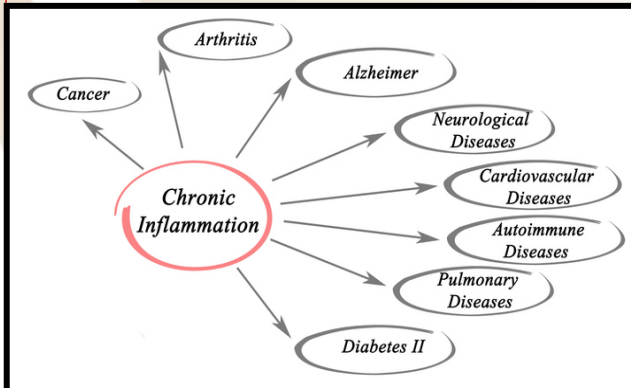


Figure 1.Vaenma. August 01, 2017. Chronic inflammation. iStock by Getty Images. <https://www.istockphoto.com/photo/chronic-inflammation-gm825465136-133887093>

## What does your diet say about the future of your health?



Figure 2. Bit245. March 28, 2019. Natural products rich in antioxidants and vitamins. iStock by Getty images. <https://www.istockphoto.com/photo/natural-products-rich-in-antioxidants-and-vitamins-gm1138658862-304080810>

## Pro-inflammatory vs Anti-inflammatory Foods

- There is emerging evidence regarding the role vitamins, minerals, and phytochemicals play in modulating the stress-response pathways (Martucci et al., 2017). Most research regarding inflammation modulators centers around the Mediterranean diet, which is full of anti-inflammatory foods

Common characteristics of anti-inflammatory foods include:

1. Nutrient-dense foods
2. High in dietary fiber
3. High in complex carbohydrates
4. Low saturated fats and sugars
5. Proteins from vegetarian sources
6. Limited animal proteins (Bell et al., 2019).

- Plant based diets are recommended due to their anti-inflammatory qualities and antioxidant cellular-regeneration properties (Mosey, 2019, p.20).
- Processed foods are considered pro-inflammatory foods, and are defined as food or drink products ready to consume, or heat and made predominantly or entirely from processed items extracted or refined from whole foods or synthesized in the laboratory (Bell et al., 2019 p.35).
- Anti-inflammatory diets include phytonutrients. These bioactive compounds improve immunity, repair DNA damage from toxin exposure, help detoxify the body, and enhance positive gene expression (Mosey, 2019, p.20).
- A healthy gut microbiome has also been linked to improved long term immunity and disease prevention, the use of prebiotics and probiotics is encouraged through a plant-based diet; whereas new research suggests saturated, high-fat animal products damage the microbiome (Mosey, 2019).
- An epidemiological study showed a lower prevalence of chronic disease in countries like India where spices including garlic, turmeric and ginger were consumed daily (Todd, 2019).

## Results

- Inflammaging often occurs without symptoms so tracking biomarkers is being used more frequently to assess chronic inflammation and risk of disease (Frank & Caceres, 2015).
- Obesity is known to be a driver of chronic inflammation and studies show anti-inflammatory diets promote weight loss (Bell et al., 2019).
- PREDIMED- a landmark Spanish trial-documented marked improvement in inflammatory markers in participants who followed a Mediterranean diet versus a traditional low fat diet (Todd, 2019).
- Studies have shown fruit and vegetable intake lowers inflammatory markers including CRP, IL-6, TNF-alpha, and biomarkers of oxidative stress (Todd, 2019).

## Conclusions

- Diet can modulate the immune response, prevent the creation of ROS and help to reduce age-related diseases and neoplasms (Ventura et al., 2017).
- Certain diets could become powerful tools to correct the systemic inflammatory balance and prevent or slow the development of frailty and disability (Martucci et al., 2017).
- Continued research is necessary to comprehend the function of inflammation on aging and its interference in the complex network of cellular pathways (Wataad et al., 2019).
- Healthy and successful ageing decreases the risk of disease and disability while also increasing the cognitive and physical capacity of individuals (Haro et al., 2017).

## References



## Nursing Care cont.

Patients that answer the majority of these questions with a YES could be suffering from chronic inflammation (Mosey, 2019, p.22)

1. Are you chronically fatigued?
2. Do you have digestive issues?
3. Do you have trouble sleeping?
4. Do you crave sweets or stimulants?
5. Do you live a sedentary lifestyle?
6. Do you suffer from skin conditions?
7. Have you been diagnosed with autoimmune conditions?
8. Do you have trouble focusing or with short term memory?
9. Do you have allergies?
10. Are you prone to muscle or joint pain?
11. Are you eating more land animal foods than plant based foods?
12. Do you eat packaged, processed foods daily?
13. Do you live under stressful conditions at work, home or in your relationships?
14. Are you prescribed antibiotics regularly?
15. Do you get sick easily?
16. Do you have trouble losing weight or with weight gain?
17. Does your energy slump after meals? (Mosey, 2019)

## Implications for Nursing Care

- The advances in health care have created an increase in the average life span for individuals and thus burdened the health care system with treating an increasing number of age-related chronic diseases.
- Advanced practice providers need an understanding of the role diet and inflammation play on ageing and chronic disease.
- Providers who educate patients about making the necessary changes to their diet can help decrease co-morbidity and mortality rates.
- Patient education and diet counseling can help patients understand how what they eat directly affects their health now and in the future.



Figure 3. Prostock-Studio. April 02, 2020. Attractive woman doctor kindly recommending eating fresh fruits stock photo. iStock by Getty images. <https://www.istockphoto.com/photo/chronic-inflammation-gm825465136-133887093>



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