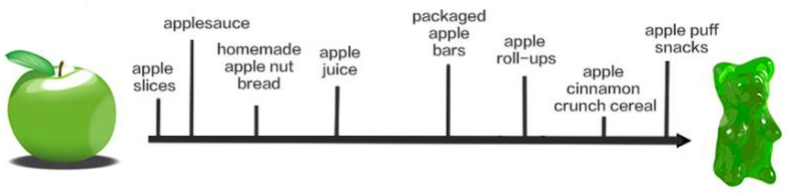
January 2022 Newsletter

Does Eating Processed Foods Affect My MS?

After a hard day's work or when you're not feeling well, it is tempting to reach for foods that are quick and easy to prepare. For many, this means turning to processed foods, which are usually high in fat, salt, sugar and other additives. Does this convenience factor come with a big price tag for people with MS? The evidence is mixed.

The U.S. Department of Agriculture (USDA) defines a processed food as one that has undergone any changes to its natural state. This can be due to washing, cutting, heating, pasteurizing, canning, freezing, dehydrating, mixing, packaging or other procedures that alter the food. It may also include the addition of other ingredients like preservatives, sweeteners, spices, oils, or coloring to enhance the flavor, texture and appearance of a meal. Technically, any food that has a nutrition label has been processed. However, the degree of processing varies widely. Minimally processed foods, such as bagged spinach or cut vegetables are simply packaged for convenience. Fruit and vegetables can also be frozen or canned at their peak to lock in nutritional quality and

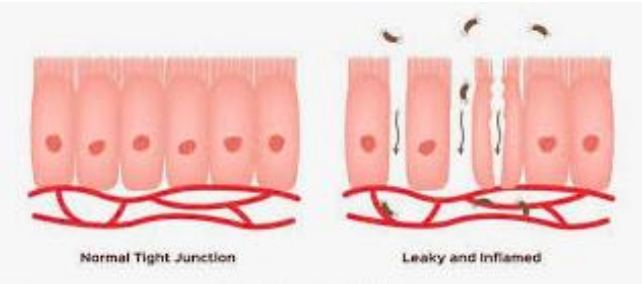


freshness. Ready-to-eat foods, such as crackers, granola and deli meat, are more heavily processed. The most heavily processed foods are pre-made meals, including frozen pizza and microwaveable dinners.

Not all food processing is bad. For example, pasteurization removes harmful bacteria from milk so it is safe to drink. Processing food can help it to be more nutrient-dense. For example, milk and juices are sometimes fortified with calcium and vitamin D, and breakfast cereals may have added fiber. Canned fruit (packed in water or its own juice) is a good option when fresh fruit is not available. Minimally processed foods like pre-cut fruits and vegetables are convenient quality foods for when life is busy.

Over the years, research has shed light on a number of different food additives and their effect on MS risk, disease course and the severity of symptoms. A 2007 study found that sodium benzoate (NaB), a commonly used food additive and an FDA-approved drug for urea cycle disorders, inhibits the disease process in Experimental Allergic Encephalomyelitis (EAE), which is a model of relapsing remitting MS in mice. Treated mice received varying doses of NaB in their drinking water, while untreated mice (controls) drank water without NaB. At higher doses, NaB significantly inhibited clinical symptoms in acute as well as chronic phases of EAE. Disease severity in the NaB-treated group remained at or below baseline, suggesting that this drug also inhibits disease progression. While further study is necessary to determine if these findings apply in humans, researchers suggest that NaB may have some therapeutic benefit in MS.

A 2015 study looked at how certain food additives affect the gastrointestinal tract and the development of autoimmune diseases. The intestinal epithelium is the single cell layer that forms the lining of the small and large intestine. It acts as a semi-permeable physical barrier, shielding the inside of the body from invasions of pathogens on the one hand and allowing selective passage of nutrients on the other. This barrier plays a crucial role in the balance of the immune response. Its permeability is controlled by intercellular tight junctions, a complex network of proteins that act as sealants between epithelial cells. Any damage to the tight junctions can lead to what is called "leaky gut," in which toxins can enter the bloodstream, potentially leading to the development of

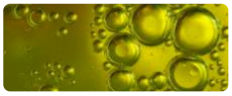


autoimmune diseases. Investigators identified seven common food additives, listed below, that weaken tight junctions in the intestine and may increase the risk of autoimmune diseases, like MS.

Food additives that may increase the risk of autoimmune diseases:

Sugar

Salt

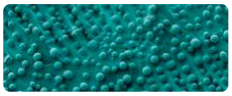


Emulsifiers are used to help combine foods that otherwise couldn't be mixed (for example, oil and water).

Organic solvents are used mainly as antioxidants, stabilizers, preservatives and to enhance flavoring.

Gluten is the major constituent in wheat. Along with rice, it is considered a staple food worldwide.

Microbial transglutaminase (mTG) is a food protein "glue" added to processed meat, fish, dairy and bakery items.



Nanoparticles are used in food packaging to improve the taste, color, uniformity and texture of foods.

A 2019 study also linked the consumption of sugar to more severe MS symptoms. As part of this research,135 people with MS completed a questionnaire about their diet. Investigators measured their level of disability using the Expanded Disability Status Scale. Participants that drank soda and sugar-sweetened beverages were divided into five groups based on how much they drank. The people in the top group drank an average of 290 calories of sugar-sweetened beverages per day (about 2 cans of non-diet soda), while the lowest group seldom drank sugar-sweetened beverages. Overall, researchers did not find a link between the sugar content in what participants ate and their level of disability. However, results showed that participants who drank the largest amounts of sugar-sweetened beverages were five times more likely to have more severe symptoms and higher levels of disability than people who seldom drank sugar-sweetened beverages.

Additional studies are needed to evaluate whether sugar-sweetened beverages affect the course of MS.

A 2020 study suggests that propionic acid (PA), a common preservative found in cheese, baked goods or artificial fruit flavors, may positively impact MS. People with MS typically have reduced levels of PA, especially early in the disease course. As part of the study, treatment naïve participants with MS took PA supplements as an add-on to MS immunotherapy. After 2 weeks of PA intake, there was a significant and sustained increase in the number of functional immune cells in the gut which work to stop excessive inflammatory processes and reduce autoimmune cells in diseases like MS. Results also showed there was a reduced annual relapse rate, disability stabilization, and reduced brain atrophy after 3 years of PA intake. Researchers note that further study is needed to confirm these results.

A nutritious, well-balanced diet combined with other healthy lifestyle choices (exercise and refraining from smoking) is the foundation of good health not only for people with MS, but also for the general public. Healthy eating includes foods that are rich in fiber and low in saturated fat, such as lean proteins, whole grains, vegetables and fruit. According to the National MS Society, "any positive changes you make towards more healthful habits are likely to help your overall health and well-being and are therefore worthwhile. Most MS experts agree that a healthy diet is an important complement to your MS treatment plan for the long-term health of your nervous system."

Some general healthy recommendations agreed upon by health experts include:	Prepare meals at home as much as possible
	Incorporate colorful fresh fruits and vegetables daily
	If you choose to eat grains, choose whole grains over refined grains
	Avoid/limit processed foods and added sugars as much as possible

Are you interested in the impact of food on your MS? ACP, through its iConquerMS initiative, will soon be launching a survey to gather the insights and experiences of our members on their access to healthy foods. iConquerMS members, watch your email inbox for more information. Not an iConquerMS member? Join now to get access to this survey and more! Accelerate research by sharing your expertise as a person affected by MS!

MS and Oral Health

A 2012 study from Spain showed that people with MS have high rates of tooth decay and periodontal (gum) disease. Oral health can be a challenge for these individuals for a number of reasons. One of the main characteristics and symptoms of MS is high levels of inflammation. Gingivitis (inflammation of the gums) and periodontal disease are more likely to occur because of this. These conditions can, in turn, lead to infection and cause MS symptoms to flare. This MS disease activity causes the release of chemicals that penetrate the gums and cause more inflammation, thus setting up a vicious cycle that, without intervention, has the potential to harm not just oral, but overall health. Other common MS symptoms, such as spasticity, weakness, tremor, facial pain and sensory changes (numbness, tingling, pain) in the hands can affect brushing and flossing. Tending to MS-related needs may not leave time for adequate dental care. Those with significant mobility impairment or fatigue may find regular dental visits too challenging.

Tips to help make trips to the dentist easier!

- Ensure the office building is sufficiently accessible.
- Determine if the office has an accessible dental chair.
- Make office staff aware of any special needs ahead of time.
- Schedule the visit when energy levels are typically high.
- Rest before and after the visit.

The medications used to treat MS symptoms can also have consequences for oral health. Steroids are often used to treat MS relapses. There is evidence that these medications worsen gum disease. According to a 2017 review, almost all of the drugs used for MS symptom management cause dry mouth. This can lead to a multitude of dental problems. Saliva is needed to reduce plaque, stop the growth of bacteria, and wash away food debris. Without it, tooth decay and gum disease can develop.

Chewing and swallowing may also be more difficult. Other side effects of MS medications include oral ulcers and swollen gums, which make it painful or even impossible to brush and floss properly.

Minimize the effects of dry mouth!

- Sip water or sugarless drinks often.
- Avoid caffeine, tobacco, and alcohol.
- Use lemon to stimulate saliva production.
- Run a humidifier at night.
- Try over-the-counter products to ease dry mouth.
- Use non-alcohol based mouthwash or chew sugarless gum.

According to the American Dental Association (ADA), the general recommendations for good oral hygiene include brushing teeth twice a day with fluoride toothpaste (after breakfast and before going to sleep). It may be helpful to replace worn toothbrushes after three to four months of use. It's also important to clean between the teeth by flossing daily. Flossing at bedtime is preferable because it removes bacteria that multiply overnight. Eating a healthy well-balanced diet without too many sugary beverages and snacks should be part of this regimen. The ADA recommends having regular dental appointments, usually every six months, for prevention and treatment of oral disease. Those experiencing bleeding gums, tooth pain or sensitivity, or jaw pain should see their dentist as soon as possible.

Ideas to make your oral care routine easier!

- Use a toothbrush with a built-up handle.
- Use an electric toothbrush or flossing device.
- Sit down to brush and floss. Try flossing in bed.
- Floss in the morning, if too tired at night.
- Ask someone's help to brush and floss.
- Wear a weighted glove while brushing to manage tremors.

Dental care is incredibly important for people with MS. Tooth decay and gum disease can impact overall health in a number of ways. They often lead to infection,

which has the potential to worsen MS symptoms. Good oral hygiene also impacts one's smile and appearance, which play a role in self-esteem and enjoying social activities. In addition, when the mouth, gums, and teeth are not in good condition, eating and digesting healthy, nutritious foods becomes more challenging. It's important for people with MS (and in general) to work with their dentist to create a personalized home oral care routine to protect their oral health.

The Dental Amalgam Controversy

Dental amalgam is a mixture that includes mercury, silver, tin and copper. It has been used for silver fillings for decades, however its safety has been the subject of much debate. Over time, small amounts of mercury vapor are released from silver fillings. How much vapor is released depends on the age of the filling and a person's habits (for example, teeth grinding). Low levels of inhaled mercury vapor are generally not considered harmful to most people. At high levels, however, mercury exposure can have toxic effects. At the center of the dental amalgam controversy are claims that exposure to the mercury vapor from silver fillings can cause a variety of health problems, ranging from joint pain to MS. Below is a sampling of studies that have been done on this contentious subject and the positions some leading MS/health organizations hold.

The International Academy of Oral Medicine and Toxicology published a summary of research that has been done on the relationship between mercury exposure and MS from 1966 to 2014. It suggests that mercury exposure from amalgam fillings (AMFs), as well as from other chronic low-grade mercury exposure, may have a potential role in the etiology of MS. Authors note that other toxic exposures likely play similar roles, which helps to explain why some MS patients do not have AMFs or other known mercury exposures.

In 1998, Canadian researchers found a possible elevated risk for MS in individuals with a large number of AMFs over a long period of time, however it was not statistically significant. Therefore, investigators concluded neither the number of, nor the duration of exposure to AMFs increase the risk of MS.

In 2001, Italian researchers also reported a trend toward a higher number of AMFs in people with MS compared to healthy controls, however the difference was not statistically significant. Investigators concluded there is no relationship between the number of or the duration of exposure to AMFs and MS.

In 2014, the National MS Society published a dental booklet that states, "There have been claims over the years that mercury leaking from amalgam dental fillings damages the immune system and causes a broad range of diseases, including MS. While the cause of MS remains unknown, there is no scientific evidence that heavy metal poisoning is responsible for either the onset or worsening of MS. There is no reason to have your dental fillings removed or replaced."

In 2020, investigators in Taiwan looked at the association between mercury-containing AMFs and the risk of MS in 612 cases and 612 controls. Results showed no association between MS and AMFs.

In September 2020, the U.S. Food and Drug Administration (FDA) issued a news release stating that AMFs may cause health problems for some people in high-risk groups, including people with pre-existing neurological conditions, like MS. It recommends those who may be at higher risk use non-mercury alternatives, such as the composite resins. The FDA adds that individuals in

high-risk groups should discuss treatment options with their dentist and analyze the benefits versus the risks of each. The FDA *does not* recommend removing or replacing an AMF if it's in good condition, unless the removal is recommended by a healthcare professional.

ADA In September 2020, the American Dental Association (ADA) released a statement supporting the FDA guidance. The ADA maintains that dental amalgam is not harmful to the general population. According to the ADA, while the FDA cites certain groups may be at greater risk for potential negative effects from exposure to mercury, little to no information is known about the effects dental amalgam may have on these specific groups. "There was no new scientific evidence cited as part of the FDA recommendation. Patients should consult with their dentists to decide which filling material is best for them based on a number of factors, such as size and location of the cavity, patient history, cosmetic concerns and cost." The ADA also agrees that existing AMFs in good condition should not be removed or replaced unless it is viewed as medically necessary by a health care professional.

January 2022 iConquerMS Spotlight

iConquerMS members shed light on the impact of COVID-19

In our last update we shared a summary of the initial findings from COVER-MS, namely, having MS does not appear to increase the likelihood someone will experience vaccination reactions. These findings were made possible by the data **you** contributed.

Read on for how you can access the full results of this analysis, learn what's next for COVER-MS, and more!

First journal publication: Our vaccination reaction findings have just been published in the medical journal *Neurology: Neuroimmunology and Neuroinflammation*. You can read the full article on the journal website, and you can also find the highlights in this infographic as well as this summary from the National MS Society.

We hope these results provide reassurance about the safety of COVID-19 vaccines for people with MS. Please help spread the word by sharing the findings with others who are looking for information on this topic. If you have any questions about the results, let us know.

What's next? With the initial findings published, we're turning our attention to additional questions about how the COVID-19 vaccines are working in people with MS. Topics under consideration include breakthrough infections and effect on MS symptoms. We're also developing a study of antibody responses to the vaccine that

will enroll a subset of COVER-MS participants.

Now would be a great time to make sure your study information is up to date!

- Have you **tested positive for COVID-19** or **been diagnosed with COVID-19** since you were vaccinated? Please complete the COVID-19 Infection survey.
- Have you **received a booster** or an additional vaccine dose? Please fill out the Vaccination Details survey on the COVER-MS dashboard.
- Have you **had an MS relapse** or experienced any **changes in your MS symptoms**? Please fill out the MS Symptoms survey.

To update your data, just log into your iConquerMS account and click "Participate in the COVID-19 Vaccination Study." Your information is valuable and appreciated!

January 2022 Research Spotlight

RESEARCH OPPORTUNITIES

Ready to Create?

Try an Art Study

University of Florida Art Research Study Seeks People with Multiple Sclerosis (MS)

What is the study about?

This research aims to explore if participation in a virtual arts program is safe, tolerable, and effective in supporting the well-being of people with multiple sclerosis by reducing social isolation and enhancing self-efficacy. The primary investigator and facilitator is a visual artist and graduate student at the University of Florida in the arts in medicine program.

Why participate?

- You may contribute valuable information that may be of use to researchers in the future.
- You will be sent all art materials and necessary supplies at no cost to you.
- You'll have opportunities explore art processes and make art.

Who can participate?

Up to 15 Adults with MS who

- have access to a computer, Wi-Fi, and Zoom
- have a physical address where art supplies can be sent

- have use of at least one hand
- are available to attend sessions on all of the following dates:

February 15th, 16th, 17th, 18th, 21st, 22nd, 23rd, and 24th

from 11:00 AM- 12:30 PM (EST)

Learn more and register today!

Visit www.ArtWorxWell.com

or

Call Tayloe McDonald at

904-962-1639

Conflict of Interest Disclosure:

The University of Florida has reviewed the possibility of financial benefit. The University believes that the possible financial benefit to the person leading the research is not likely to affect your safety and/or the scientific quality of the study.

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iConquerMS™

Your health data has power!

A new topic for the Our Questions Have Power program!

When it comes to MS symptoms and how to manage them, what questions are most important to you? What symptom-related topics do you wish researchers were studying? **Your questions are valuable** and we invite you to share them through the **Our Questions Have Power** program on the iConquerMS website.

The Our Questions Have Power program was launched in March with an initial focus on COVID-19. Questions submitted by iConquerMS members have helped shape the COVER-MS vaccination study and are being shared with the research community to guide other efforts.

We're now extending Our Questions Have Power to include a second topic: **MS symptoms and their management and treatment**. As before, you're invited to share questions on this topic that you think should be studied and to vote on questions submitted by other iConquerMS members.

We'll share these questions with people affected by MS, researchers, healthcare professionals, advocates, and funders – and, together, we'll work to launch research studies to answer those questions.

It's easy to share your ideas and input in Our Questions Have Power!

- Log into iConquerMS to start (create an account first if you don't already have one).
- Have a research question to submit? Click **PROPOSE an MS Research Question** to submit a question you'd like to see studied.
- Want to weigh in on other people's ideas? Click **VOTE and COMMENT on MS Research Questions** to review, comment, and vote on questions submitted by other iConquerMS members.