



THE EDITOR'S DESK

Science and Clinical Potpourri for Your Life and Your Practice

More Reasons to Include Fiber in Your Diet?

JAMAnetwork.com, April 17, 2019.



The numerous and popular low-carb diets (think Atkins and keto) have driven home the notion that carbs are bad for us, primarily because they are highly refined and linked in many ways to concurrent high sugar ingestion. But like fats, there are good and bad species of carbs, with some high in fiber content.

A good deal of recent and solid research finds that intake of fiber and whole grains—probably due to their high fiber content—but not foods with a low glycemic index, was associated with significant reductions in mortality and chronic illnesses.

The use of fiber in these studies, which are observational and not randomized controls, found an associated 15% to 30% decrease in all-cause and cardiovascular-related mortality and incidence of coronary heart disease, stroke, Type 2 diabetes, and colorectal cancer in those who consumed the most dietary fiber relative to those who consumed the least. What was also shown was that compared with low intake, high dietary fiber intake was associated with lower body weight, blood pressure, and serum cholesterol. The studies also found a general dose-responsive phenome-

non operative, that is the more fiber ingested, the greater the associated positive effect. Again cause-and-effect was not demonstrated, but the association seems pretty strong.

In most westernized countries, not enough of us consume the recommended amounts of dietary fiber; for example in the US the average dietary fiber intake by men and women is 18 g and 15 g, respectively, yet, the *2015-2020 Dietary Guidelines for Americans* recommends a daily minimum intake of 33.6 g per day for men and 28 g for women 19 to 30 years of age.

If you buy into these studies, and traction among healthcare providers appears to be growing, then it seems that any of us wanting to lower the risk of a variety of cardiovascular disease and many different cancers, might want to consume more, not fewer, carbs, as long as they're good carbs such as fiber-rich whole grains, legumes, fruits, and vegetables.

The rationale behind fiber's purported health benefits suggest a mechanical effect (fiber accelerates the transit time of stool) but this is not the only benefit. Changes in gut microbiota and metabiome are observed, and in the case of cereal fiber, improved insulin sensitivity, lipid profile, endothelial function, and reduced inflammation is observed.

In other words, the explanation for why a high-fiber diet appears to be protective goes beyond the obvious and awaits further delineation.

"Pins & Needles" in the Arms and Legs



Call them paresthesias, or simply

"pins & needles," we all have had them and it is usually a result of having your extremity, or some part of it in an unusual position resulting in stress or pressure not normally present. Likely this is due to a "pinching" of a nerve or a localized ischemia from compromised blood flow. Once the "pinch" is released and blood supply provided the nerve(s) begin firing and send a host of delayed signals to the region.

As far back as the 1940s, Oxford University researchers studied the "pins & needles" effect finding that after three to four minutes of carefully applied limb pressure, subjects felt a very light tingling. After 10 minutes, the limb was judged by the subject as completely numb with virtually no feeling and when the pressure was relieved, the "pins & needles" sensation manifested rapidly.

But not all paresthesias are innocuous—they can signal more serious conditions, such as direct nerve damage, rewarming after hypothermia, Raynaud's disease, diabetes, burns, strokes, and over-use of alcohol. As it is nerve related, nerve inflammation, injury, and disease can cause paresthesia.

There are a variety of presentations of what are classically termed paresthesias. Formication is the sensation of insects crawling across the skin; hitting one's "funny bone"—hitting the ulnar nerve at that unprotected region in the elbow, causes that electric jolt-like sense down the whole nerve. Tapping/hitting most any nerve can cause a similar sensation, the classic occurring in the aged who experience a jolt down the length of the spinal

cord after flexing the neck or back at a weird angle.

A cold sore can cause a tingling sensation caused by the Herpes virus just as a jalapeño pepper can cause significant (!) tingling on the inside of the mouth. These so called “mouth paresthesias” may also be caused by needle trauma to nerves or vessels during dental injections.

The study of “pins & needles” may also lead to better understanding of complex chronic pain syndromes as well. So, next time your foot or arm or hand gets a “pins & needles” sensation, consider all that is going on, and know that there is a lot of science that has gone into unraveling its mechanics.

Hepatitis C Virus Contamination of Vial Surfaces

Anesthesiology, May 2019.



A 2014 hepatitis C outbreak at several Ontario (Canada) colonoscopy clinics led to significant study that targeted contaminated medication practices by anesthesia providers. Follow-up investigations revealed just how easily the hepatitis C virus (HCV) is transferred from previously sterile needles and syringes into medication vials, if the diaphragm has been previously contaminated. Common vial cleaning practices were found not to be sufficient to prevent HCV transmission.

A substantial body of research clearly demonstrates that we routinely contaminate our anesthesia workstations with practices that have previously not been carefully scrutinized. Certainly, the way we draw up drugs and administer them to patients is plagued by opportunities for contamination.

The investigators were concerned that during the care of an HCV-infected patient providers might contaminate the diaphragm of the medication vials that are subsequently used. They undertook a sequential set of studies beginning

with a simulated contamination of multidose medication vials that contained cell culture media. Then they sought to determine whether HCV remains viable over time in commonly used medications in sufficient quantities to initiate an infection using similar infection protocols on the outside of the vials. Lastly, they examined the effect of common cleaning practices on the eradication of HCV infectivity.

Problems with infectivity and viral durability were found in all the tests. For example, a single wipe of the diaphragm with 70% isopropyl alcohol was not able to eliminate HCV infectivity; a 10-second wipe dramatically reduced the risk for contamination but did not completely eliminate HCV infectivity.

Education is key, as is perhaps a change in practice, which is being discussed nationwide. Maybe our “one vial for one patient” routine is insufficient to eliminate risk of viral and bacterial transmission. Perhaps it is an issue of need for greater vigilance. Some suggest that our patients would be better off if those medications were prepared under sterile conditions in the pharmacy. But that involves the risk of significant logistics, waste, and of course money. Stay tuned for future developments.

The Increase in Female Speakers at Medical Conferences Over the Past Decade

JAMA Network Open. 2019;2(4).



While not involving nurse anesthesia conferences, this was an analysis of 181 medical conferences from 2007 through 2017, finding that the proportions of female speakers significantly increased from 24.6% to 34.1%. These proportions mirrored the percentages of practicing physicians who were women during the same time frame. While the proportion of female speakers at these conferences increased during the last decade, women remained underrep-

resented at medical conferences.

It is clear that gender equity is a prominent issue in the health-care professions. With respect to physicians at medical conferences, representation of female physicians at academic meetings is known to be an important component of gender equity; however, this topic has not been systematically assessed until this study was done.

It seems that the time is right for academic nurse anesthesia to examine this issue to assess the state of gender equity in the conferences that target nurse anesthetists. Anyone out there up to the challenge?

“Bubble Boy Disease” Treated with Gene Therapy

N Engl J Med. April 17, 2019.



A child from the 1970s became the iconic “bubble boy” who lived in a plastic enclosure to avoid germs due to his immunodeficiency disorder. Work done over the decades has recently played out with the successful use of gene therapy in eight children to treat what is known as “X-linked severe combined immunodeficiency disorder” or X-SCID. Here an innocuous virus was used to insert a missing gene (IL2RG) into bone marrow cells. This heralded the use of a safer virus than one used some 2 decades ago which had activated a cancer gene.

It appears that this gene therapy in conjunction with targeted chemotherapy may offer hope to those with X-SCID, but as with any new intervention, only time will tell if there are inadvertent and unpredictable downstream consequences.

Smell Receptors in the Tongue?

Chemical Sense, June 2019.



Olfactory receptors, the ones that permit us to detect odors in the nose, are also in the taste cells of our tongues. It appears that the

interactions between smell and taste, both of which comprise flavor, may actually begin on the tongue and not in the brain as previously thought. This provides a more solid scientific framework that helps explain how odor molecules modulate our perception of how something tastes.

Consider this: we can recognize that something smells like strawberries, even though a strawberry doesn't appear to have much of a smell when you sniff them. This is one example of how our sense of smell helps create a flavor.

The sense of taste handles sweet, salty, sour, bitter, and umami (savory) molecules on the tongue. A pear and an apple taste pretty much the same if you hold your nose while eating. What our brains

do when we eat something is to combine taste and smell, alongside information from other senses, to create what we perceive as flavor.

It has generally been believed that information pathways from taste and smell remain separate until reaching the brain. Researchers found that this assumption remained somewhat unchallenged but were stimulated to reconsider it all in thinking about how snakes extend their tongues so that they can "smell" or sense their environment.

After developing techniques that would allow them to create and maintain cultures of taste cells, researchers found many of the molecules present in human olfactory receptors. Then employing molecular imaging, they demonstrated these

cells responded to odor molecules in a manner similar to olfactory receptor cells. Additional experiments by the scientists demonstrated that a single taste cell can contain both taste and olfactory receptors, which supports the present findings.

These kind of basic science revelations may have important translational impact. Better understanding how smell and taste interact could also better inform us about either of those senses individually. It is interesting that we do not know what compounds activate the vast majority of the 400 types of functional human olfactory receptors. The cells cultured by the team, which respond to odors, could be used to screen molecules that bind to such receptors.