

THE Duration *Wellness* SHOW

Your Genes Are Not Your Destiny: Actionable Steps To Prevent Dementia

with Dr. Karen McCarthy

You don't have to accept cognitive decline as an inevitable part of aging, even if you have a genetic predisposition. Host Dr. Anna Marie and internal medicine specialist [Dr. Karen McCarthy](#) share actionable protocols for proactive Dementia Prevention. They discuss how targeted lifestyle changes can modify genetic risks, balance your gut microbiome, and optimize cellular clearance systems. You'll learn the science behind intermittent fasting, heavy metal detoxification, and the critical role of sleep architecture. This discussion gives high-performing professionals the diagnostic tools and daily habits needed to preserve their cognitive edge for decades.

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Your Genes Are Not Your Destiny: Actionable Steps To Prevent Dementia With Dr. Karen McCarthy

Proactive Medicine And Brain Health Evolution

Welcome to the show, a show focused on health and prevention. With me are [Dr. McCarthy](#) and my mom, who has decades of experience in preventive medicine and internal medicine and was ahead of the game in preventive care for her patients. We are going to talk more. It is in our series on dementia prevention and brain health. I'm so excited. Thank you for joining.

Thank you for having me again. I have been very excited, actually, about this show because I did quite a bit of research on it and tried to update my notes on it. There is just so much. It is moving fast with this branch of medicine on brain health. It is very fascinating now what we're finding out.

It is exciting that there are so many things that can be modified too in terms of risk. Which I think goes into the first question that we were going to talk about. People think about dementia risk. They often think in a very fatalistic way. Either it runs in my family, and that means I am going to get it, and that is it, and there is nothing I can do. Is that really the wrong way to think about it?

Yes. We briefly touched on that in our prior episode, but just briefly. We will go into that a bit more in detail. As we mentioned in the last episode, there are different types of dementia, and some of them will be mainly genetic. If we're talking about Alzheimer's, then there are so many modifiable factors that can make quite a difference even if you have that genetic predisposition for Alzheimer's. We know positive lifestyle changes can be a huge game changer for dementia prevention.

Can you share a bit on diagnosing these modifiable factors and how they can be implemented?

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“Dr. Karen McCarthy provides an incredibly detailed, prevention-focused approach to medicine, looking past immediate symptoms to solve the underlying root causes of cognitive decline.”

The Recode Protocol For Cognitive Recovery

I had years ago read some of the studies from Dr. Bredesen. He's an MD neurologist and does so much research for Alzheimer's patients, and he published a book called [*The End of Alzheimer's*](#). It points out that Alzheimer's disease can be prevented and potentially reversed through lifestyle changes. It is not a matter of most docs when they get a patient that comes in, and they have.

You can see clearly they already developed Alzheimer's, and they'll put them on a pharmaceutical medicine like Aricept or some other type of medicine, and it may help a little bit with some of their cognitive decline, but it really does nothing to reverse it or end. It is not used as a preventative type of medicine. He emphasizes this personalized approach for each individual because we each have different modifiable risks, and he uses a protocol called the ReCODE Protocol. It is in his book.

He is a good resource too for studying this, but he uses the ReCODE Protocol to check for modifiable factors and then what you can do to correct those modifiable factors. Key strategies that he uses.

There are seven of them. In his protocol, he includes nutrition, exercise, sleep, stress, brain stimulation, detoxification, and supplementation. Hopefully we'll go over a little bit about that.

We know there are other strategies to help us with preventing cognitive decline, like learning a new task, playing an instrument, painting, learning a new language, exercise, of course, but we're going to go into quite a bit of detail on that in the next podcast. They also have little apps like BrainHQ that exercise the brain, and all of these strategies may be helpful too, but I really like what he zooms in on in his ReCODE Protocol.

Learning new things is really important. There was an article I was reading. It was going over neurodevelopment. If you think about a baby that is in a toddler stage, entering into a toddler stage, how much they're learning in all those neurons and those new pathways that are being developed. As adults, we plateau, and then as you get older, it starts decreasing.

As you're trying to learn these new pathways, which means it is especially in things that are not in your field, learning a brand new language that you had no understanding of before, it really makes your brain work a lot harder. If you're not used to technology and you're really starting to get better with technology and learning all that. All those things that you have to form new pathways for in the brain, they really show are so helpful in terms of this prevention aspect.

They can be more challenging because you like your routine, whatever work or field you are in, so comfortable just continuing to study in that area. It really is the new tasks and new areas to learn that are beneficial.

How should audiences understand the balance between genetics, aging, and lifestyle when it comes to dementia risk? Something I heard once is that genes can load the gun, but environment and behavior can determine how those risks actually play out.

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Overcoming Genetic Risk With Autophagy

I do not know if that is a good analogy, but I think it is a good analogy. Again, that ReCODE Protocol by Dr. Bredesen has more specific steps to determine how genetic risk may be modified, and so he also goes into the benefits of fat burning with intermittent fasting. Intermittent fasting for those, there are different ways to do it. They have the 5/2, where you do less than 500 to 600 calories two non-consecutive days of the week, but most people are using intermittent fasting where you have nothing to eat after.

Usually, after dinner, you try not to eat three hours before bedtime because that is better for your brain health anyway with the cleanup system. It is basically just fasting from that point after your dinner until the morning, where it's an extended fast, 12 to 16 hours. You really get more benefit if you extend it to 14 to 16 hours of fasting. That really helps with autophagy, which means to eat up. It is our way of eating up the debris and the dead tissue, if you will, that can also potentially gum up the system in our brain health. That's one way.

Of course, he emphasizes cardio and resistance training, but we've been reading more about HIIT, High-intensity Interval Training, like the Norwegian 4x4, where you go all out for four minutes and then you rest for three minutes, and then you repeat that four times. It is a 4x4. I cannot do that. I'm maybe doing like one minute hitting it hard and then one minute resting ten times. There are different ways to do it, but that has been shown to have some benefit because if you increase that VO2 max, then that's really beneficial for brain volume and brain health. We'll go into that more in the next episode. You said, right?

Yes.

Also in this protocol, he has a whole workup where you will check for any viruses or bacterial overgrowth or mold spores and remove pathogens and any chronic inflammation in the body and also address glucose metabolism and insulin sensitivity because we know that's very important. We'll go at the end of this podcast going over environmental toxins, avoiding those, such as heavy metals like mercury. That's a biggie. Microplastics, pesticides, and ensuring good quality sleep with normal oxygen saturation and normal sleep architecture because those are so important.

Again, for the cleanup system when we're in deep sleep. Other modifiable factors he goes into are optimizing nutrient and hormone levels. In my own practice, I would often use, in doing the workup for my patients who were concerned about cognitive decline, I would do all the labs that he advised so that we could and GI assay and other tests so that we could find out what is possibly abnormal and correct that modifiable factor so it would not be continuing on to progress with Alzheimer's and cognitive decline. One of the last ones that we went over last episode was the genetic apolipoprotein E status.

Tweet: Your genes are not your destiny. Strategic lifestyle shifts and personalized protocols can modify even high-risk genetic factors.

Again, when you're looking at your risks, there's all of the environmental things that we just talked about, like your exposures. You wanted to know if you have heavy metal exposure. You want to know how your sleep is, all that. Your body is so complex, which is why it was hard when we were doing this show trying to tease out different areas. One of them, I think, why it's important to know this genetic status, is where you are in terms of your risk. It can help you know how aggressive you need to be on these other modifiable risk factors. If you should be looking into all of these other things that can affect you having a higher risk for dementia down the line.

Managing The Apolipoprotein E4 Risk Factor

That was the interesting thing because we mentioned you have the E2, E3, and E4 forms with this apolipoprotein E, and E3 is the most common. It's neutral on brain function. E2 appears somewhat protective, and then E4, unfortunately, increases your risk of Alzheimer's. Having one E4 allele doubles to triples the risk of Alzheimer's. Having two E4 alleles actually raises the risk more than tenfold, with early onset of dementia. As we'll go into later, even having that apolipoprotein E4 status, you can modify the risks from having that.

One of the things that I was reading recently is that when you have an apolipoprotein E4 status, you're more likely to have, we'll go into it more, breakdown of the blood-brain barrier, the protective covering over your brain. It also hinders the absorption of omega-3s. Omega-3s are one of the most important nutrients for brain health, so you have to take in a double amount of fish oils in omega-3 form. That's something to always check for. Of course, exercise, all the other things. He also suggests blood tests for inflammation. CRP, ESR, cytokine panels for those that are not aware. Those are your interleukin-6, tumor necrosis factor. Just checking, even autoimmune.

If some of those are off, go further with autoimmune workup and testing for anything that we could correct metabolically or with autoimmune. The other one, and we did this briefly, was the test for the MTHFR gene, because I do feel that a lot of times patients are not tested for that. We know that reduced MTHFR activity can raise something in your blood called homocysteine. Homocysteine, if that's elevated, then we know you get accelerated brain atrophy, whether it's from blood vessel disease, vascular disease, we're not sure. Also, low activity of this MTHFR can impair the methylation of DNA, and that is really an accelerator of aging and brain aging.

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“Alzheimer's disease can be **prevented** and potentially **reversed** through lifestyle changes.”



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Just to remind everybody, for the MTHFR gene, it basically is involved in this methylation pathway for folic acid. If you're missing that and it's not actually able to, you have these different pathways where your body is unable to change things that you're taking into the active form. If it's not able to do that step, then you're not able to use what you're taking in, which is why for you have this gene, a lot of times taking in more methylated vitamins can be helpful because then instead of, if

your body is not able to do that step on its own, then you're actually introducing the vitamins and nutrients that it needs, it's past that step.

That's something that's also correctable. Just get a good methylated folate, and I actually have this decreased activity. I take a 15-milligram methylated folate because that goes through the blood-brain barrier. Methylated folate and B vitamins themselves, including B6, B12, folate, thiamine, which is B1, and homocysteine. These are all blood tests you can do and find out what needs to be corrected. Also vitamin C, D, and E. We know a lot about vitamin D, and it's measured as 25-hydroxy vitamin D in a regular blood test, and you should have your levels, I think, 50 to 100. I know the labs will say above 30, but really for overall health and brain health I would say bump that to above 50.

The literature supports having higher levels. Normal is different than optimal. I will say every person is unique and so there can be varying levels of optimal based on the person, but overall, if you're looking at the population, I do think optimal is higher than what is called normal for vitamin D.

He stresses in his protocol that these are all just going over the list of labs that you could get so you can check out these modifiable factors. The other one would be your omega-6 and omega-3. As I mentioned earlier, we know that patients with that apolipoprotein E4 gene require more omega-3s. If you're vegetarian, you can get a little bit of omega-3s through ALA, but really the main source should be fish. I am seeking a good and now I found one, a good source of omega-3s that is from clean fish. What are your clean fish? SMASH fish.

First S is salmon, then mackerel, then anchovies, then sardines, and then herring. Those are your clean fish, low in mercury, and that's the supplement I am taking for your fish oil omega-3s. Omega-6 in our terrible diet is linoleic acid. It is Omega-6. We have more of that than Omega-3s. That's very toxic and pro-inflammatory, so we want to bump it in the other direction, get higher Omega-3s, and that ratio is important.

Which is also something that I feel like is talked about more now in terms of actually testing the ratio, but before I think it was not very common that people were talking about it, and it still is not in standard labs, actually getting that ratio.

It's something you have to request, actually, I think. A lot of these not even checking for vitamin D's a lot in labs, and I think that's such an important one.

Tweet: Intermittent fasting does more than burn fat. It triggers autophagy, which cleans up the cellular debris that gums up your brain.

It is. There was actually a New England Journal of Medicine, they had like a little article, and they were saying that vitamin D was tested too much, and I was like, that is not true at all.

I know, I do not know why it's so important. I will say this one thing too for those that have more melanin-pigmented individuals, more melanin pigment, which is protective for them against sun damage and wrinkles and all that. They tend not to as effectively produce vitamin D through the skin because of the melanin. They often have very low levels of vitamin D. That's really important to check because that can be a modifiable risk factor for those patients.

Sunscreen is so important. I'm a big fan of sunscreen, but it also decreases the vitamin D that you're getting from the sun.

Sunscreens that do not have forever chemicals. The zinc and titanium oxide. The other thing he measures, of course, your fasting insulin level and glucose. Your glucose average that we measure

over three months with hemoglobin A1C, and these are very good also. Now we have the new markers, neural exosome studies. That's like your P-tau protein.

Remember, for causing brain health decline, if you have a high amount of this beta-amyloid protein and tau protein in your brain, these can be a real problem with causing further inflammation in the brain. They have a blood test now where they can measure P-tau and then the amyloid beta 42. That's an amino acid peptide derived from the amyloid protein. These are tests. The new one that I just read about, Anna, was Dr. Wells's.

One test is called Neuron Restrictive Silencer Factor. NRSF, Neuron Restrictive Silencer Factor, and yes, it can be measured. That is so important as a transcription factor that regulates new neuron growth, neurogenesis in the brain. Of course, the usuals. Exercise and nutritional support can improve that number, but it can be measured. That's an interesting one because if that's high-functioning, optimally, then you have more production of that BDNF, which is brain-derived neurotrophic factor. That's a good marker too.

Actually, I've never heard of that one. That's interesting.

I just read about that.

It's new. That's what's cool about this. I feel it is how much is starting to come out in terms of, and even with blood tests, that you can actually pick up.

Leaky Gut And Systemic Inflammation

All these tests. Of course, your body mass index, lipid panel, the usual, glutathione levels we can measure indirectly. I always recommend checking for gastrointestinal permeability.

That's basically what most people have heard of as like a leaky gut. If your body, in terms of its GI system, is not working well. You have that barrier that is broken down. You are not going to absorb important nutrients the way you are supposed to, but also things that are supposed to stay in the gut can get out. It can cause inflammation and a lot of issues.

We will go into that a little bit more, but that is a huge contributor to inflammation in the body. He does recommend a microbiome assay and then zonulin and LPS, lipopolysaccharide levels in your blood. I will go into that later. Testing. Hormone tests. Pregnenolone, cortisol, estradiol, progesterone, DHEA, free testosterone, and of course a full thyroid panel with the free T3, T4, and TSH. Heavy metal. If I did not do this, I did a heavy metal panel. I will share with the audience that mine was high. I did my analysis through a company called Quicksilver, where they break down the mercury. Is it coming from fish? Is it coming from dental fillings, amalgams, silver fillings, or could it be from both? Mine was from both.

This is again something that usually is not ordered by your regular primary care doctor, and a lot of times you have to ask for it because it is just not standard.

They will also check with these heavy metal panels. Cadmium and other metals like lead, arsenic, and cadmium are in some of the dark chocolates. We have always seen some contaminants, unfortunately, because of the way plants are grown now with all the contaminants in the soil. Other tests that he mentions are copper, zinc, selenium, magnesium, and your chem panels. Sometimes he will do these cognitive performance tests. There are even neurologists that will do MRI imaging so they can check the volume, the cortical volume, and the volume of your hippocampus and see if there is any brain atrophy there.

That is pretty much your workup there. We know that, again, just jumping ahead here with the leaky gut, like you mentioned, that LPS, lipopolysaccharide, is something you can measure in your blood. The body does produce antibodies against bacteria that enter the bloodstream via this leaky gut. It results in these antibodies helping LPS, lipopolysaccharide. Just remember LPS. That is on the bacterial surface. Similar antibodies to the barrier protein, like zonulin and occludin, can all be measured and indicate leaky gut. He uses a panel, Cyrex Array 2, for it.

Tweet: A leaky gut leads to a leaky brain. Rebuilding your intestinal barrier is a critical first step in preventing neuroinflammation.

He also has other panels for measuring food sensitivities that can cause leaky gut. The gist of it is if you can get it corrected, there are other ways to measure leaky gut that I will not go into now. He says at the end, and this is what I added. Minimize the ultra-processed foods, which are linoleic acid, gumming up the system and killing our mitochondria, the powerhouses of our cells in our body. We talked about alcohol being toxic and high fructose loads and all of that can increase the leaky gut and disturb the normal bacteria that are in our gut. We develop gut dysbiosis. That is the troublemaker. Even medicines that we give, we know PPIs, proton pump inhibitors like Nexium, Protonix, Prilosec, they all can contribute to this leaky gut and mess up our gut flora.

There are times, obviously, you have to have them if you have bad stomach ulcers, things like that, where you have to decrease the acid, but it's also important to review and see when you can come off of those. What else you can modify in your diet, try to improve and change in terms of trying to decrease some of those medicines. You're probably going to talk about NSAIDs too, like ibuprofen, Advil. Even though they're labeled as non-inflammatory, supposed to be decreasing inflammation, they do not actually decrease inflammation, unfortunately, in your intestinal tract.

The other one would be antibiotics, which we talked about last time. That can actually disturb your normal gut flora and, last, cause gut dysbiosis. Is out years sometimes with certain antibiotics. The biggies there are clindamycin and the fluoroquinolones like Cipro. The less the better if you can do it. I know there are times you have no choice. Anyway, we do see that it's better to eat healthy yogurt. I make my own yogurt from Dr. Davis's book on gut health.

I mentioned that because he has a yogurt recipe that you can make at home, with very high concentrations of bacteria called *Lactobacillus reuteri*, which is so important for correcting gut dysbiosis, or bad bacteria, in the upper intestinal tract and the small intestines. Most of our probiotics and prebiotics hit the lower intestinal tract in the colon, but this yogurt is really good for the upper intestinal tract. Probiotic, prebiotic, and then I got my kombucha, kimchi, all those things.

Highly fermented foods. Time and staying away from the bad guys will help to correct its leaky gut and thereby prevent the entry of bacteria and toxins into our brain. How we think it does. These fragmented proteins and bacterial particles, as you said, go through a leaky gut because usually the leaky gut will protect us from these fragmented and undigested food products from going into the bloodstream. You lose that protection with leaky gut, and they get into the bloodstream and cause all kinds of problems. There was something I had read early on that if it's really messed up, sometimes GI docs might consider glutamine to help with the integrity of the leaky gut.

Which is interesting because there's actually a lot of glutamine in it. I feel like people talk about bone broth and how that can actually decrease inflammation. Some people say it's because of the glutamine that's in there. Obviously, it's very hard to tease that out.

That's a good source of protein, for sure.

We were talking about the APO gene before. You were saying something about the leaky brain barrier. What exactly happens with the leaky brain barrier, and how would I mean? Obviously, I guess you're saying if you have that gene, it's a higher risk?

Rebuilding The Blood-Brain Barrier

Yes, the blood-brain barrier, and again, the apolipoprotein E4 carriers can develop this leaky blood-brain barrier faster. The blood-brain barrier, it is just a protective barrier. It's almost like a gatekeeper between your blood and your brain, so it regulates, in a protective way, what gets into your brain and gets in and out of that brain and central nervous system. Just like the gut, it's a very tight junction that forms this blood-brain barrier. They're tightly connected with these endothelial cells lining the brain capillary.

It allows controlled entry of nutrients and signaling molecules while restricting pathogens and toxins that could be harmful to the brain. It's just a good protective design there. Increased permeability, just like increased permeability in the gut lining, you can get increased permeability or a leaky blood-brain barrier, which allows these plasma proteins and cytokines and toxins and immune cells into the brain. That triggers and amplifies neuroinflammation, inflammation in the brain tissue. Chronic or repeated blood-brain barrier disruption is definitely linked to cognitive decline.

How would you test for that then?

Unfortunately, we do not have any blood tests yet to measure that, and they're working on that in research, but I could not find any tests that can really measure it. I would say, though, that major causes of it, including blood-brain barrier, do include cardiovascular disease and cardiovascular risks. They will also increase the chance of you developing blood-brain barrier leakage. Metabolic diseases, including diabetes. We know that's always a troublemaker, but people that had major head trauma, too. Trauma, strokes, any injury to the brain, that can hinder your blood-brain barrier protection.

We mention toxins in apolipoprotein E4 status. This is an interesting field, and we're finding out more, too can be compromised because of environmental toxins, which we'll go into later on. We have microbial toxins like bacterial products and mold spores and toxins. Evidence from cell, animal, and human studies suggests that even the spike protein from SARS can disrupt the integrity of this blood-brain barrier in some people.

They had in vitro blood-brain barrier models using human brain endothelial cells showed that exposure to that spike protein, the sub-bacterial one subunit, reduced the integrity of the tight junctions in the blood-brain barrier. They found increased permeability to tracers across the blood-brain barrier. We know that some people, after they had the infection or even with the vaccine, some patients saw some cognitive decline for sure. That may be explaining it. It's just all ongoing research right now.

To see if all those patients had the APO4 gene.

They would be more at risk. You're right.

I just would be interested if it showed up in some of them, if that was it.

Tweet: Your brain has its own waste clearance system. Deep sleep is essential for the glymphatic system to flush out harmful toxins.

One other thing. I mentioned the leaky blood-brain barrier for more immune diseases like lupus and multiple sclerosis and other neurodegenerative diseases. We'll see that too. That's as much as I could get in a short time for a leaky blood-brain barrier.

It's complex. It's an emergency field, which is interesting, and it's cool as we learn more about it because I think it'll help us even more in the preventative realm. We talked a little bit earlier about the glymphatic system, just briefly, which is the brain's waste clearance system. How would you say that affects dementia prevention, brain health, and how solid would you say the science is there?

Activating The Glymphatic Waste Clearance System

This is a fascinating area that's really new, and finding out more about the importance of a functioning, well-functioning lymphatic system. This system is our, like you said, waste disposal system, our cleanup system from debris and pro-inflammatory proteins and chemicals in the brain. It does depend on efficient circulation and drainage of cerebrospinal fluid in our brain. It removes metabolic waste from brain tissue, including soluble proteins like amyloid beta, the terrible protein that is in Alzheimer's, tau protein, and other metabolites.

It actually flushes them from the interstitial fluid in the cerebrospinal fluid and out into your lymphatics. When this process is impaired, the brain's ability to clear amyloid and tau proteins and other toxins diminishes, and then we're finding out that this accelerates dementia. The glymphatic system flushes out harmful toxins, especially during your deep-stage sleep, and poor sleep definitely hinders this cleaning process. Certain sleeping pills we know can hinder it too. We know Ambien has definitely hindered this glymphatic system, and that's why we're seeing we're seeing more cognitive decline with patients taking Ambien for sleep.

Benadryl, I know, also has an increased dementia risk. I wonder if it has the same effect.

I did not have time to check it, but we know that any medicine like Benadryl, the antihistamines as we discussed in our first episode, and anticholinergic drugs can definitely compromise your brain health.

They've shown a significant increase in dementia risk. Which is wild because a lot of people, I feel like, used to be like, "I cannot sleep, let me pop a Benadryl." It was very common. Yes, also to be used, in terms of allergies. That stuff is very benign, and then now we're starting to see that association.

Bladder spasms. There are so many other uses for anticholinergic drugs, but yes. Ambien for sleep and benzodiazepines for sleep, like Ativan or Xanax or whatever. They are just messing up this glymphatic system, and then you get all the accumulation of that waste, more inflammation, and a decline in brain health and Alzheimer's. What they did say in the research is to prioritize 7 to 9 hours of consistent high-quality sleep, as lymphatic clearance is much more active during deep non-REM sleep than wakefulness and protects the circadian rhythm.

We went into that a little bit, but regular bed hours and wake-up times, and morning light. As soon as that sun's coming up and you wake up, go and let that be in that light for 10, 20 minutes at least. Limit internal light and blue light from computers and iPads, and limit your caffeine and alcohol, since disruptive sleep and fragmented sleep can impair this lymphatic flow and increase more of your amyloid and tau protein burden.

Animal and small human studies suggest lying on your left side. I did not think. I thought it was your left side, but actually, for lymphatic flow and drainage. The best position to be sleeping in is on your right lateral side. At least that's what they are finding out. I used to say it was my back, or if anything, the left side would be the best, because yeah. They said that if you lie on your right side, it is associated with the most efficient lymphatic transport, then in a supine position.

They think it's possibly via effects on the venous outflow from the brain. For what it's worth, until we find out differently. I'm trying to lie on my right side now. More time spent in a supine position at night has been associated, though, with markers of poor lymphatic clearance and neurodegeneration in observational work.

It's interesting on all the sleeping sides because I think I would have to look it up again, but when you're pregnant, I think it's the left side.

You're right because the drainage is better in the abdominal cavity on the left side. Also, to help this lymphatic waste system function properly, avoid late-night meals. Again, intermittent fasting is helpful and may support this lymphatic activity. Cardiovascular exercise, again, HIIT. This is one thing. High-intensity interval training may help really improve your lymphatic flow. It has better waste disposal.

Getting all that junk out of your brain when you're sleeping will work more effectively with HIIT exercise. That's a tough one for me because I find it very difficult doing HIIT, but everything works up to it, maybe, and if not, at least stick with being mobile and exercising. That's what I'm saying and getting some cardio and resistance training. I find it fascinating because it is a new branch of neurology, really, and finding out how we can improve it, it helps with our brain health.

Preventing it is really the biggest thing because once people really have severe dementia, the treatments are unfortunately not great, and it is progressive and it ends up being a terminal disease. If you are able to prevent it, that is the most important thing. It's way better. There are a lot of environmental toxins that can contribute to cognitive decline. Obviously we cannot avoid everything, but we can at least try to avoid some and limit some. I do not know if you want to go into talking about some of those toxins. We touched on them briefly, but a little bit more in-depth.

The Detrimental Impact Of Microplastics

There are so many. I had to choose just the biggies that I've been reading about. We are in a toxic world, and our food is toxic, and our air is toxic. Many of those toxins definitely interfere with our cognitive health in a negative way. One of the most detrimental toxins to our brain is microplastics. Some studies have now shown that we have close to a teaspoon of microplastics in our brain. A teaspoon.

Somebody else I was reading they were saying it's like a credit card's worth.

I did hear that, but yeah, they said basically compare it more to a teaspoon now because of a credit card. I see people envisioning a full credit card. Patients we know with Alzheimer's disease have 10 to 20 times more microplastics in their brain tissue than people without Alzheimer's disease.

Which is interesting because I feel like for a long time people are like microplastics, but we do not really know what it's going to affect, if it really does. We see it in the brain, but we do not know if there are effects. It seems like now science is starting to show, at least with correlation, that people who have a higher amount of microplastics in the brain do have some effects. Honestly, it just makes sense in terms of it's not supposed to be in the brain, and if your body's inflammation affects this whole dementia and cognitive decline, it is just hard to think that microplastics, which should not be there in the brain, would not have an effect like that.

These smaller particulates of plastics, your microplastics, your nanoplastics. Now they have been shown to even block these brain capillaries and disrupt blood flow and axonal connections and everything. This causes more protein aggregation of the tau protein and the beta-amyloid protein. They build up, and then we have problems. We already know from cardiovascular literature that they find these little microplastic particulates in atheromatous plaques in your arteries.

Why would it not affect the capillaries and blood vessels to your brain? The microplastics also trigger a lot of glial activation, oxidative stress, and cell death of neurons in the brain. It is toxic to the brain. Certain foods, though, that they're finding out may help with some of this are the foods that have anthocyanin in them, the bluish-purple-colored fruits and flowers, to mitigate the damage from this.

That might be why blueberries are so good, one of the reasons why they're so good for brain health.

Maybe so they listed the biggies that have this that helped to reduce the damage from the microplastics. Blackberries, blueberries, black currants, purple sweet potatoes, black rice, red cabbage. I was not sure of this, maqui berry. I have not either, but purple corn, so it's that purple color and bluish color. Just so the audience knows, if you're a gum chewer, chewing a single piece of gum releases hundreds or thousands of microplastics into your saliva, with the average gum chewer at risk of ingesting 30,000 microplastics in a year. That's according to a recent pilot study.

I know it's one of the reasons I stopped chewing gum because, yeah, it's just terrifying.

Mitigating Forever Chemicals And Toxins

Some people were using it to help with dental cavities, with the xylitol gum for the P. gingivalis bacteria and decreased dental caries. This is very harmful because regular gum is very high in microplastics, because that's what makes it gummy. Microplastics are a biggie. The next one is forever chemicals, your per- and polyfluoroalkyl substances. These can really disrupt that blood-brain barrier tight junction and allow more glyphosate and all kinds of bad toxins into the brain too. What are they? Per- and polyfluoroalkyl substances also accelerate the progression of cancers.

Tweet: Microplastics are a real threat to cognitive longevity. Protect your capillaries by eliminating plastic cups, bottles, and gum.

We know with colon cancer, and we see it causing cancers and health problems with firefighters who come into contact with these PFAS, or forever chemicals, in the firefighting foam that they use. They're loaded with that. They're more likely to develop cancers, and we see these PFAS in our household items. I am sure most of you know. Water-repellent fabrics, stain-repellent fabrics, cleaning products, nonstick cookware, paints, fast-food containers, wrappers, microwave popcorn, pizza boxes, candy wrappers. It's also in the lining of your canned goods a lot of times. It is in our sports bras. It's in tampons. It's in dental floss. I'm telling you it's everywhere in our products, and you really have to be proactive and find out what's clean and what's not.

It's taken. We've been slowly detoxing. I feel like some of our household stuff, and it's hard because it also can be expensive. For people who are on a tighter budget, I would say your biggest bang for your especially for things that are hot that you're going to be eating. Your cookware and things like that where you're heating it up. It's really way more likely to break down. Anything that is where it's going to be heated. It's just a lot easier for those chemicals to then get into your food, especially with food exposure. Other things are if you have a high amount in terms of time in it. It's like your sheets.

You're spending all night there, especially if you're somebody who sweats and heats up at night. That's another place where you can try to limit it. Also, the other thing that can help is if you also cannot get rid of everything, at least washing it first and having something that's clean can at least decrease the shedding. It will not fully remove it, but it can help. That can at least help decrease it if you cannot. It's hard to have everything completely clean of this because, as you said, it's in everything, but at least be aware of it and try to limit it.

You can opt out in some places from treatments on your furniture and carpet and clothing and so forth. Try to get that natural fabric, which you told me about with a certain company that makes just wonderful organic cotton clothes. Single fabrics like your linen, silk, or cotton are your best bet. All this polyester clothing that we have, even in workout clothing. I wonder how much is being absorbed.

Even when you think about takeout foods. I feel like ordering out can be so common and everything. You just think about all of that hot food, then it's like breaking down the particles that it's in, and so if you have your own glass container, things like that, stainless steel. All can be very helpful.

More natural, less flammable materials that do not have the flame-retardant chemicals, like your leather, wool, cotton.

Even baby stuff. This is something I learned, I think, with my first, is I would look, and it would say, you know, "flame-resistant." Other things would say, "Not treated with flame-resistant." I am like, "Why is this baby clothing treated like flame-resistant?" You look into what the chemicals are for that, and you're like, "I do not want my baby in that."

Especially in their little brains developing and getting these toxins. A lot of people have read about things with the microwave popcorn. Do not do the bags. Just do air popping or the old-fashioned way of popping it.

Pop it on the stove.

Put in some healthy oil. Cast iron, as you said, enameled cast iron cookware. It's durable, easy to clean, and does not have these harmful chemicals. A recent study, just last week that I read, was from Swedish health data, where they found researchers measured 24 polyfluoroalkyl compounds in the blood of over 900. I think it was 907 patients recently diagnosed with multiple sclerosis. They measured patients recently diagnosed with multiple sclerosis and then 907 healthy controls, and they also considered seven byproducts from other forever chemicals, that was measuring polychlorinated biphenyls.

In the end, participants whose blood contained a higher concentration of these chemicals, the forever chemicals and the PCBs, had a significantly higher risk of having developed multiple sclerosis. That makes you think. We have all these treatments for MS, but boy, if that's the toxic insult. These forever chemicals make it so much more likely, with your nature-nurture, to get multiple sclerosis. You might want to think down the road if it becomes more of a legit treatment, doing the plasmapheresis, removing chemicals forever.

Plasmapheresis, we touched on a little, but it's not like a thing you can just do on your own. It's more in the research mode. Some people are doing, like, a billionaire that's wanting to live forever. He's doing this plasmapheresis, where it takes out your blood, removes the forever chemicals, and it replaces it with albumin. It gets out these forever chemicals, which, if that's something that they're going to find out could be a potential treatment for MS and other neurodegenerative diseases, then I would do it. One real quick is glyphosate. That's in Roundup and a lot of these pesticides. We know that glyphosate can cross the blood-brain barrier and accumulate in our brain tissue in a dose-dependent manner.

It should be totally outlawed nationwide. Glyphosate increases heavy metal disposition too because these heavy metals can be wrapped up in the glyphosate, and they can be more easily penetrated by the barriers that are set up for our brain because glyphosate causes your intestinal barrier and your blood-brain barrier to both become more porous and leaky. You're more likely to get a leaky gut or leaky brain. These toxic metals can easily shuttle across, like mercury, along with the glyphosate, and

wreak havoc on your brain health. We know oats, wheat, barley, legumes, chickpeas, lentils tend to be high, unfortunately, in glyphosate because these crops were sprayed with glyphosate right before their harvest as a desiccant. A drying agent to speed their drying process.

I know that was something that is wild to me that I learned about in this process. When they're dried, even then they would get so it's not just sprayed while they're growing. It's then, right before a harvest, they're sprayed again. It's double whammy, triple whammy.

It's because it's sprayed in the soil, it's aerosolized, everybody's getting an aerosolized form, and then they spray it again just to make sure it dries properly. It's wrong, but we discussed a little bit about the benefits of the infrared saunas and getting high temperatures to help clear this out, and again the sulforaphane. Those are released in your cruciferous vegetables like your broccoli sprouts, cauliflower, so forth. Sulforaphane is an excellent detoxifier of this particular glyphosate, microplastics, even benzene. I do not make my own, so I have gotten with another podcaster suggested by Avmacol.

That one is a good one you can just take daily as a detoxifier. The other one I was reading, Dr. Wells, which was interesting, was glycine. Why glycine to help remove glyphosate? Glycine is used for the detoxification process. In order to eliminate glyphosate, you need to saturate your body with glycine. Some say taking like four grams of glycine powder twice a day for a few weeks, and then you would go down to one gram twice a day. This forces the glyphosate out of your system into the urine and to be excreted. We know that that's another possible way to eliminate these toxins, but the infrared sauna, the sulforaphane, and the glycine.

Which is interesting because glycine can help with sleep. It is partially why, at [Duration Wellness](#), we developed [Sleep Club](#), which is a sleep supplement, and glycine is part of the formula. You wonder if it's also helping in terms of how you're detoxifying. Interesting.

Also, quickly, a few other pesticides. I wish we could just outlaw all of these pesticides and herbicides. We know there are many environmental toxins linked to the increased risk of Parkinson's disease, and they really mess up the dopamine-producing neurons in our brain and the mitochondrial function in our brain, causing a lot of these oxidative stress problems. We see that in industrial solvents and air pollution. It just goes on and on the list, so I could not go over everything.

We do know that these two pesticides I wanted to mention. Paraquat, glyphosate, all of these are used in agriculture and have been tied to Parkinson's in farmers and people living in rural areas. They just take the plane and dust the crops, and it gets aerosolized, the glyphosate. Also, industrial solvents such as trichloroethylene are found in cleaners, paint removers, and contaminated water like at Camp Lejeune, and we found out that this elevated the risk in exposed veterans of Parkinson's by 70%. That's huge for brain dysfunction.

Agent Orange also, and then recreational drugs like MPTP, it's a neurotoxin. The new one I read about is something called chlorpyrifos, CPF. It's a pesticide linked to neurodegenerative developmental harm in children, and it's still sprayed on eleven different crops in our country even though scientific studies have consistently shown that even small exposure to this chemical during pregnancy can cause irreversible brain damage. Decrease IQ and causes autism and hyperactivity in children. Chlorpyrifos. It's part of the organophosphate family of chemicals, and it includes substances similar to nerve gas, so it's very neurotoxic.

Anyway, it interferes with acetylcholinesterase. I will not have time to do all of that, but it is very harmful to the developing brain, especially in fetuses and young children. We know the golf course. We mentioned this last time. Pesticides that are sprayed on golf courses. The closer you live to a golf course, the greater the likelihood of developing Parkinson's. Specifically, your odds nearly double, a whopping 126%, when residing less than a mile from these pesticide-sprayed golf courses. Even

modest increases in distance help reduce the exposure, but you're still going to get some damage there. We know it's in the drinking water near golf courses. It is something to keep an eye on. If we stop spraying this stuff. The other one is atrazine.

It's an herbicide in agriculture, of course. Through the water systems and air, it's been shown to greatly accelerate brain aging. An increase in risk of these neurodegenerative diseases. Heavy metals, I guess we'll wind it up with this one. I got a few, a couple more things. Do we have time, or should I do it? Heavy metals like mercury, lead, cadmium, manganese, and aluminum are widespread in our environment and are associated with impaired cognitive function and decline.

Heavy Metal Exposure And Detoxification

Mercury is the only heavy metal, remember, that's capable of causing a normal brain to develop the same biochemical abnormalities found in an Alzheimer's brain. Mercury causes all of these problems with the neurofibrillary tangles and all the things we see in the Alzheimer's brain with abnormal tau protein. What happens is mercury inhibits this neprilysin, which is the main protease in the brain used to eat up or gobble up the bad protein beta-amyloid. It's really important to get rid of all the mercury that you can through the dental restoration to get rid of the metal. Avoid mercury, silver fillings, and large fish, such as swordfish and so forth.

For our women audiences who have been pregnant or are pregnant, that's part of the reason why they say to avoid the heavy mercury fish because of all of the risk for your baby's brain and development. If you're having high levels of mercury, then it has severely detrimental effects on the baby's development, and that's because of this.

The concentration of it. Of course, we have a lot of aluminum in our body. You do not cook a baked potato covered in aluminum. That's how I used to do it for years. That aluminum can get into your food and get into your tissues. Common sources of antiperspirants, some of them are loaded with aluminum, nonstick cookware, and other things. Of course, a. A diet high in these ultra-processed foods is high in linoleic acid, which is an omega-6 polyunsaturated fat, and we've seen it in processed seed oils. Canola oil and vegetable oils, all that can be high in that.

Overconsumption of linoleic acid can really interfere with the mitochondria of your brain cells, put a lot of oxidative stress, and increase brain aging too. Those are the biggies. I know there's been new stuff on electromagnetic frequency with the 5G network and just trying to eliminate that. This was interesting with the EMF. You're using your cell phone and putting it right to your ear, and if you have a lot of amalgam fillings on that side, it actually was shown in a study to release more mercury vapor. We're just finding out about that. Of course, higher long-term exposure to fine particulate air pollution was associated with increased risk in these heavily contaminated air locations for Alzheimer's disease. Yeah.

Takeaway is probably the limit. If you can decrease your exposure to begin with, that's obviously the best way. Just limiting your toxic load. That's where it's like trying to decrease the toxins that you're putting into your body, in terms of, if you have it, reverse osmosis for water. It's helping to filter out your water. It's decreasing a lot of those chemicals that then can be through the soil, the microplastics that can come through all of that, that could be in your drinking water now.

Especially for people who are drinking, I feel like people used to think drinking those bottled waters used to be so healthy. Now we know well that those bottled waters are just terrible for microplastics. And any of the other chemicals that can be in the plastic too. It also can have a lot of times they'll say BPA-free, but it can have other chemicals that are in there that are just like BPA. Limiting it first is one of the biggest things because then you're not having to detoxify as much if

you're at least having a lower amount coming into your system, and then the detoxifiers, as we talked about, like the broccoli sprouts and all the cauliflower.

All those vegetables that are high in sulforaphane, and then the saunas, in terms of trying to sweat things out, exercise, all of those are so important. That's also where air filters can be important, especially for people. If somebody's already living next to a course, it's not like you can exactly. It's not easy to just move. Trying to limit your exposure in other ways or at least decrease some of that.

When they're spraying on the golf course, keep your windows closed and eliminate that exposure. Those are all great suggestions. We're trying to change out our clothing with the forever chemicals and stainless steel containers and your cutting boards. Get rid of the plastics as best you can. Now we're drinking from our glass coffee maker. The one last thing that is new to me, at least, is that there's a supplement coming out here that is using a natural metabolite called urolithin A, which is produced by your gut bacteria after we eat good foods like pomegranate, strawberries, raspberries, and nuts.

According to some initial evidence in humans, this urolithin A, it actually may promote something called mitophagy. Now remember, autophagy is just gobbling up the debris in our body. Mitophagy is specifically gobbling up the dysfunctional mitochondria. Mitochondria are the powerhouses of every cell in our body, very important for fighting oxidative stress and energy production. This urolithin is also something that has improved mitophagy, which is gobbling up the dysfunctional, bad mitochondria in your body.

It's a process that removes aged or damaged mitochondria, which can wreak havoc on your cells in your body, and it contributes to having healthy cellular function throughout all your body's cells. In animal studies, there has been evidence suggesting that this urolithin A may even prolong lifespan and provide some protection for the aging brain. What's coming out now is that it's Mitopure, but it's basically urolithin A, so just something new to think about.

That's what's exciting about this area. It used to be that the common thought was there's not much you can do for dementia, but now we're starting to find that there is a lot in terms of brain health prevention-wise. If you're even with those genetic risks, you can actually modify a lot, which is exciting. We'll find out more and more. Thank you. This was such a good discussion. I loved it.

Sorry if it was too long or too much of an overload there.

It was great. Great information for everybody, and as always, this show is not intended for medical advice. It's for educational purposes only. I appreciated the discussion and cannot wait to do another one soon.

Thank you.

You guys have a good one.

Important Links

- [Dr. Karen McCarthy on LinkedIn](#)
- [The End of Alzheimer's](#)
- [Sleep Club](#)
- [Duration Wellness](#)

About Dr. Karen McCarthy



Dr. Karen McCarthy is a highly respected internal medicine physician known for delivering detailed, prevention-focused care and for taking the time to truly understand each patient's overall health. In addition to a distinguished medical career, Dr. McCarthy founded the City Rescue Mission medical clinic more than 30 years ago and has spent decades caring for underserved communities. Through numerous medical mission trips and a lifelong dedication to service, Dr. McCarthy has made a lasting impact both at home and abroad. She takes an in-depth approach to health, looking beyond immediate symptoms to better understand root causes and support long-term wellness.

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