

Staying Sharp – Buffalo, NY

September 28, 2013

THE DANA ALLIANCE FOR BRAIN INITIATIVES

LR: Good morning. Good morning everyone, we're ready to get started. Welcome to Staying Sharp, Ask the Experts About Keeping Your Brain Young. My name is Laura Reynolds and I'm a Senior Project Manager with the Dana Alliance for Brain Initiatives. Dana, in partnership with MetLife Foundation and AARP has arranged this morning's program. This year we celebrate 20 years of education and outreach. In April 1993 a press conference was held in Washington, DC, to announce the launch of the Dana Alliance. The founding members pledged their commitment to advancing public awareness and education about the progress and promise of brain research and to disseminating information on the brain in an understandable and accessible fashion.

I share this quote by David Mahoney, former Chairman of the Dana Foundation, who two decades ago said: "We all have a stake in neuroscience. At some time in our lives every last one of us will experience a brain related disease, disorder or brain injury. Neuroscience is lifting the burden of brain

diseases and disorders.” I’m sorry, “Neuroscience research is lifting the burden of brain diseases and disorders. It is unleashing our potential as individuals and it is revolutionizing our attack on the social and economic problems that face our nation as we enter the 21st Century. All that we are and all that we hope to be is centered in the human brain, and that’s why neuroscience is truly the human science.”

Now, 20 years later, we celebrate the achievements of the Dana Alliance and applaud the ongoing commitment by our members and supporter in the broader neuroscience community, to share their knowledge with the public for the betterment of all.

Thank you for coming. I’d ask everyone to silence their cell phones before we get started with the program. We’re going to have a brain fitness warm up. So the music is going to start and we’re going to get everyone up on their feet. Thank you.

RD: Good morning. Just one little thing. There’s a saying that I always like to use: exercise for the body is good for the mind. So could we all say that together. (Group repeats) And one last part to that: exercise for the body is good for the mind and

I'll be fine at age 99.

(Warm-Up Video Not Transcribed)

BA: Good morning. My name is Bill Armbruster. I'm the Associate State Director for AARP, and I'd like to thank Richard Derwald. Does every body know Richard? (Applause) If you don't, he runs classes all over Erie County. If you can find out more about him at the table in the back with Erie County Senior Services. So, good morning. Welcome to Staying Sharp. Thank you for getting early on a Saturday morning. I looked out, I saw the sunshine and I said, "Oh, I wish it was raining." Then everybody would feel comfortable coming in on a not so nice day. So I want to welcome you to Staying Sharp. We're going to start the day with a conversation with two local experts on the aging brain. We're going to talk about what's normal, what's not, memory, things you could do to make sure you're staying healthy and your brain is staying healthy. And then we're going to open up for question and answers. So make sure if you have questions, make sure address the audience, we'll be taking notes.

First I would like to introduce Dr. Jessica Englert. She is a clinical neuropsychologist at DeGraff Memorial Hospital, Kaleida Health, Department of Neurology. (Applause)

And Dr. Gil Wolfe. He is a Professor and Chairman of the Department of Neurology at Irvin and Rosemary Smith Chair at the University at Buffalo, School of Medicine and Biomedical Sciences at the State University of New York. (Applause) Welcome.

Now, you had your fitness warm up. We're going to be here for a bit. Make sure you're taking care of yourself. If you need to swim while we're talking that's okay too. Restrooms are out in the hall. Make sure you get up, take care of yourself. If you want to stand in the back and move around, make sure that you're comfortable through the day. Don't feel like you're being forced, that you need to sit down. And again, my thanks out to the Dana Alliance for Brain Initiatives. They're our partner in this outreach. Make sure if you did not stop by, just about everything we're going to talk about is in the bags that our Dana Alliance had out, they'll be on your way out today. Make sure you take the bag. There's also a lucky brain in here in case you lose your mind. There's another one right in the bag so you have something that you can go with. I am going to let our panelists introduce themselves, just sort of tell you a little bit about them before we get started.

So, Dr. Englert.

JJE: Good morning. Thank you for having me. I am a clinical neuropsychologist, meaning that I am, if you're not familiar, I'm a psychologist who went onto then specialize in brain anatomy and function. So one of the areas I work in frequently is dementia. I had a specialty in my training with early onset mild cognitive impairment, which some of you may be familiar with, and then trying to slow down, hopefully, the process for some folks, with treatment and intervention. I work at DeGraff Hospital in a private practice, but also work with Kaleida Health.

BA: Dr. Wolfe?

GIW: I'm a neurologist. I just moved to this area from Dallas, Texas, about a year and a half ago, to run the Neurology Department at University of Buffalo. I think many of you are aware there's a lot of growth at University of Buffalo, specifically at the Medical School, and so a lot of the departments, including mine, are hiring faculty. I trained at University of Pennsylvania, where there is a very strong memory disorders program. And we're going to talk, potentially, about some of the proteins that build on in the Alzheimer's brain. Many of those discoveries, especially tau, were made at the University of Pennsylvania. But I run a department here. We do have Memory

Disorders Clinic inside the department that Dr. Szigeti runs.

Unfortunately, she's not with us this morning. We were hoping she would be able to make it. But that's my background.

BA: Great. Now, Dr. Englert, you've offered to kick us off a little bit. We hear about staying sharp, but let's just get some basics on the brain. You can start us out with that.

JJE: Although I feel like I need music and I need to jump around – tough act to follow. All right, so let's talk about the brain. It runs the show, right? The brain has kind of mystified people throughout history. How much does it weigh? Does anyone know? Three pounds. And it is the most vital organ, although we're probably biased in that regard. It has a network of 100 billion or more nerve cells and it basically orchestrates everything, all of our thoughts, all of our actions. More than anything else, it defines who we are. The brain, including the aging brain, is fine tuned by our experiences, both its performance abilities, and then cognition, which is what I specialize in, memory, language, attention, how we solve problems, how we organize things, all of this is run through various parts of the brain, which we'll talk more about today specifically.

And then we'll also talk about memory in

depth. I know a lot of you have questions about that, and then the various aspects of memory – working memory, long-term memory, short-term memory, all of those good things.

BA: Let me ask you a question. My wife always says I think like a man. Is there any truth to the myth that men's brains, women's brains are different? And also, is there any difference in the aging brain of men and women?

JJE: Well, I believe one is from Venus and one is from Mars, so legend says. No, there is actually ... men's and women's brains develop differently in youth and adolescence and early adulthood. But actually the aging brain, research has not shown that there is significant difference in aging for men and women, however, more women are diagnosed with dementias, but research is showing that's because women live longer. So that's why there's a greater percentage.

BA: Let's start talking about memory, learning and memory. Is there correlations with that? What do we need to know in terms of memory and learning?

GIW: You can have learning without long-term memory encoding. I'm going to back just a little bit. When we talk about the brain in general it's billions of cells, which over time we

lose, unfortunately, but the brain can remodel. But those cells, the way they work is through electrical signaling and chemicals. Our brain would not work without electrical impulses and chemicals that communicate from one cell to the next. The process of actually encoding memory, and Dr. Kandel, who is a Nobel Laureate, and I actually was able ... when I was in college at Princeton, he came and gave a guest lecture. But he studied memory in lower organisms and in order to encode memory in a longer-term process, excitatory chemicals, or what we call neurotransmitters, you may have heard of that term, and Bill's going to stop me if I get too technical. But there are certain chemicals that have to interact with certain receptors and glutamate is one of those chemicals that has to activate a certain receptor class called NMDA receptors. Without that activation, you really don't encode memory in the parts of the brain that are devoted to memory. And key parts of the brain, at least in higher organisms like ours, is the temporal lobes, which are kind of ... let me try to ... they're sort of on the inside area of your brain here, sort of pointing to each other, the two temporal lobes.

So there can be learning, like when you're just remembering a phone number real quickly that somebody

might tell you, or if you're in the doctor's office and they say, "I want you to repeat these five numbers in order," you may not have any kind of long-term memory encoding of that, but you can learn it very, very briefly. So there are some differences. Some memory is recent memory, some memory is remote memory like who the president was when you were born. I remember many of you in this audience can remember that. That would be sort of a remote memory encoding. And there are different parts of the temporal lobe and different areas just outside the temporal lobe that are devoted either to very recent memory or more remote memory.

BA: So glutamate, is that what you said, is the chemical for ...?

GIW: Glutamate is one of the key excitatory neurotransmitters in the brain.

BA: So can I get me some of that at the pharmacy?

GIW: There's actually some medications, indirectly, we try to use to affect glutamate activity and so forth . It's a little complex. But Namenda, which his one of the drugs for Alzheimer's disease – and there are not many drugs and they don't work all that well – but that actually works through NMDA receptor

mechanisms. But no, you can't just go and get glutamate. You make glutamate, actually. We all make glutamate, but yes.

BA: Thinking about memory, I think a lot of people are here because we want to know what's normal? When should we start to be concerned about our memory? And I heard this term that said that the brain is plastic, or has plasticity. Now, I know my bumper on my car is plastic because when my son's girlfriend hit it, it shattered. So is that the same kind of plastic or plasticity we talk about with the brain?

GIW: The term plastic, plasticity is used is because plastic is malleable to some degree, you can mold it. And what plasticity actually means when it comes to the brain is how the brain can change itself through natural processes physically, which means actually making new connections. This occurs even adult brain. We used to think of the brain as a static organ. It really can change for the better most of the time. Sometimes plasticity leads to problems though, but we're going to talk about it from the positive aspects of plasticity, but it can be structural changes; chemical changes, changes in the way the neurotransmitters are functioning, these chemicals that I mentioned before. And the last one is functional changes as well. All those are part of plasticity.

And we see attempts by the brain when it's injured to try to take advantage of these potential favorable changes that we call plasticity. That's even seen in the dementia, in the dementing illnesses. One of the first things I studied – I don't do this anymore, but just to try to explain plasticity in another way, which is fairly simple because this was one of the earliest works that we could tell that the brain can actually change. And this sounds awful, but if you do experiments on animals, on lower mammals – it can be done on mice and rats, hamsters as well, we were using – if you close one of the eyes, if you sew it shut so the animal can't see out of that eye anymore, the area of the brain that is normally devoted – which is in the back, the occipital lobe – to that eye, it doesn't just degenerate, the other eye starts taking over that area. So that's a plastic change that can occur just with the visual system itself, and you can see this in the somatosensory system, you can see it in memory systems as well. The somatosensory system is how we feel things, like if you touch a hot stove, that's a sensation or just sitting on a chair, if you think about it, you can feel your bottom on the chair cushion. That's part of the somatosensory system. There's plasticity built into all these systems.

JJE: To kind of tag onto that specific to dementias, there is some hopeful and I think exciting research that's come out showing that even at earliest stages, so when I mentioned before that mild cognitive impairment, which we'll talk more about later, but those kind of early changes that happen with memory, specifically just memory, the brain has developed changes. There's been plasticity that has developed which is showing that with certain types of exercises we can increase certain abilities, like problem solving, perhaps. So memory might not be as good, but we can improve problem so living, or we can improve some areas of language through the plasticity. So change can happen even when some negative changes have already started in the brain.

BA: So that's good news.

JJE: That's very good news. Absolutely.

BA: Let's start talking about memory. I go into a room, I forget what I went there for. I call my wife, she's going to Wegman's or the grocery store and she goes, "What did you want me to ...?" and I forget. What is, or is there normal memory loss associated with aging? And if you could talk about it, and just sort of let us know, at what point – what's normal? What should we not

be concerned about?

JJE: Sure. I trained at a memory clinic at Dartmouth College and one of the things we used there was senior moments. We really liked that phrase. It sounds like some of you have also used that as well, that kind of forgetfulness, some of which you were saying, you know, dropping your keys or forgetting what you walked into a room for. Some of that is very normal – slowing down, having some mild forgetfulness. However, when you start repeating yourself in conversations frequently, your family members point that out; when you get lost; when you forget that you've even driven to the supermarket, let alone parked your car there – those things are very concerning. And that amnesic process, amnesia, basically forgetting that something happened completely, those are times to become very concerned.

GIW: When that forgetfulness starts lending itself to problems in social situations or occupational situations, that's when it really starts getting concerning, but it's ... as we get older, and I can tell you personally, I have a harder time remembering names now than I used to. But I still function and work fairly well, but when it takes the next step, that's when we're starting to worry that this not just normal senior moments, forgetfulness, that there may

be something there. Unfortunately, these are not uncommon problems. Mild cognitive impairment and the dementias are not uncommon problems. We see them all the time in our clinics.

BA: There's normal things you do. I talk to people all the time, like, "Oh, I can't remember if I took my pill today for my blood pressure, for my arthritis," and I see people using pill boxes. Me, personally, I'm blind as a bat without my glasses, so if I don't put them in one of two places, I can't find them. I've actually been late for work sometimes because I can't see and I can't remember where I put my glasses. What kinds of things could or should people do?

JJE: Sure, it's all about developing strategies. So simple things like leaving your keys in the same place, leaving your purse in the same place, like you said, leaving your glasses in the same place, vital to survival in some ways if you can't see around the house. Pill boxes are very important. I'm not sure if you recommend those to your patients as well. I also tell people to take photographs of the pills and have them printed out, and then next to that write a legend saying what the medication is, what it's for, what time it should be taken. That way also if they're not feeling well someone can help them with that system. It's kind of a

safety checklist in some ways.

BA: And I've seen people buddy up too. They check in on each other, give a reminder call and follow up with folks. This is normal, we're okay with this, that I can't find my glasses, my keys. I showed you earlier, I will never lose my keys because they're attached – again, another thing I typically can't find. So when should I start to get concerned? Or not just about myself but if there's someone in my family, what types of things, even early on, what are some of the early on things I should be worried about? Or seek help?

JJE: One of the things, just to kind of backtrack a little bit, is that people are very busy and one thing we always have to look at is, are you in a time of stress? Is there something going on? Are you a caretaker? Other things that have caused distractions in your life, so trying to reduce those distractions, and not always assuming that you have a memory problem just because there are many other things going on at that time.

When you should get concerned is not only when you ... when people point it out, that's definitely a good time to pay attention and maybe talk to the doctor about it. And I think it's better to be screened by your physician and possibly have a

neuropsychological evaluation sooner than later, to have piece of mind.

BA: What types of things would I notice, perhaps, about someone else?

JJE: Not only having trouble recalling words, but just a complete loss of names. If you pause and it comes up that's one thing. If you pause and you can't come up with it, that's a big concern.

GIW: Forgetting things that they really should not – what they did yesterday or the day before, what meals they might have had. If you were with them two or three days ago and they really don't remember the details – people should remember that if it was really only just a couple of days ago. If they constantly are asking the same question over and over, if you notice changes in behavior, if you notice changes in hygiene, things like that could be early signals; more difficulty with language, coming up with words, not just names but coming up with words for something. That's part of the mini-mental status testing that we do on patients all the time. Like I think most of you can remember, what are these called?

GROUP: Glasses.

GW: People with early memory loss may not remember what the clear part is – what's that called?

GROUP: Lenses.

GW: That's a little harder to remember. Things like that are signals that there may be some underlying problems. Yes.

BA: I had a family member, and I think we sort of knew there were some memory issues going on, but she covered. It was like, "So what did you go today?" "Anything that came along." All the answers were nondescript. "What did you have for lunch?" "It was wonderful," but never specifics. And then we started to see the stress in her and she developed a coping mechanism which really hid it from the family for a while, and after a certain period of time it's like, wait a minute, we're not getting an answer.

JJE: No, exactly. And you bring up a good point. People are very comfortable in their routines. And they know their routines very well. So if you only question them on their daily routine, they will most likely have those answers down pat. It when we ask about things that happened that were out of the ordinary, or names that they're not necessarily familiar with.

BA: Are there any other warning signs? I hear of things, sundowners and others.

JJE: Changes in sleep. Personality changes are a big one. You touched on this a bit, but becoming very angry, very frustrated very quickly. Sometimes that kind of flash of anger signals changes in certain parts of the brain. And the sleep cycle changes, appetite changes, maybe mood concerns, or signs of other things that need to be checked on.

BA: And when should we start to think things might be heading towards Alzheimer's? Is this all along the same level?

GIW: Well, Alzheimer's, to make the diagnosis, at least early on, is difficult because a dementia actually implies dysfunction in numerous areas of brain function, okay, memory plus other things – executive activities which are like judgment, planning your day, making decisions. You want to see impairment in more than just area before you really label somebody with dementia. But there can be these early signals where there's only one brain sort of area of dysfunction and it may only be over time if patients are picked up early enough that you really figure out, are these patients relatively restricted in an MCI, we call it for short,

mild cognitive impairment, or if they're actually progressing to a dementing illness? And many patients with MCI, but not all, but many do end up progressing to Alzheimer's or another form of neurodegenerative dementia.

But I think patients are coming into clinics earlier. I know Dr. Szigeti, for instance, has programs for the healthy aging who are just a little bit concerned that maybe their memory is not quite right, but they're really functioning quite well, to start following them, do baseline neuropsychologic surveys on them with different tests and so forth. And so I think people are coming into clinics earlier. And yes, some of those patients will end up developing a true dementing illness, but not all.

BA: Is all dementia Alzheimer's? Is all Alzheimer's dementia?

JJE: All Alzheimer's would be a dementia, yes. All dementias are not Alzheimer's disease. There are various types of dementias.

BA: Can you just sort of talk about maybe some of the different types of dementia?

JJE: Sure. Dr. Wolfe, please jump in. The vascular dementias, so that's changes in the blood vessels in the

brain. There's mixed, which would be Alzheimer's disease, which is an actual plaque and it tangles to their proteins that build up on the cells, and then cause cell death, which causes atrophy, or the shrinking of the brain. That's actual Alzheimer's disease. That's the name of ...

BA: Can you go through that again? I got scared for a moment so I stopped listening.

JJE: I didn't mean to scare you, just giving a science lesson. So, with Alzheimer's disease there are plaques and tangles, and it's a protein that forms on the cells, or inside the cells.

BA: Plaques and tangles, okay.

JJE: So I tell patients sometimes it's like you have nice, smooth hair, like in the shampoo commercial, and if you throw a glop of gum in it, it kind of stops the conduction of the nerve signal. And then it causes that cell, or those cells to die, which then causes the brain to shrink a little bit, which is what atrophy is.

BA: In that situation, is this where the plasticity comes in, that we talked a little bit? In these situations, can the brain, or does the brain try to adapt?

JJE: In some ways, yes. Yes, absolutely. We go to other strengths, the cognitive strengths that we have, and utilize those. Absolutely. And that's why if you have an assessment, you know where your strengths lie so that we can try to build on those things.

BA: What's an assessment? If I went in, if I come in, I'm concerned, my wife's concerned about me, let's put it that way, which she usually is, I come in, what would I expect out of an assessment?

JJE: Out of a neuropsychological?

BA: Yes.

JJE: Usually people have seen a neurologist or their physician first and sometimes they'll do a very short screener, the mini mental status exam with them, where they'll ask you to repeat some numbers and glasses and a pen and things like that. When you come in for neuropsych I would sit down with a patient for up to an hour, with them and their family members, and address concerns. We look at your medical records. And then you'll sit down with the doctor or a technician and you'll answer some questions about memory. It's kind of some puzzles and games. You'll draw pictures, you'll repeat words. We'll ask you some

factual information. We'll ask you to define some words. Things like that, so that we can look at the various different functions of the brain. It's not scary. We're pretty nice. We get a bad rap.

BA: If I came in to see you, Dr. Wolfe, what kind of assessment or what type of testing types of things would you do if there was concern.

GIW: We do first a very careful history, and I just want to go back. As Jessica mentioned, not all dementias are Alzheimer's disease. We hear about it the most because it really is the most common form of neurodegenerative dementia, and if you take all memory loss together, it's going to account for 30 to 50 percent.

 Before I go to the other neurodegenerative dementias – and the reason we take a good history is it helps us parse out which one it might be, because you really don't know for sure unless you do a biopsy, and we don't generally do brain biopsies to figure out the type of dementia. That's a big deal. And we're not completely accurate by the history, but we get a pretty good idea. Let me first start with reversible forms of dementia. There are some. Hypothyroidism; B12 deficiency; other deficiency states can also cause a dementia. There is pseudo-dementia

which is linked to depression. Bad depression can also cause a dementia-looking pattern, we call that a pseudo-dementia. Those are reversible – antidepressants or electroconvulsive therapy, for instance, for depression, even exercise can help people with depression management. Hypothyroidism, replace thyroid; B12 deficiency, replace B12. In the older days ... you still see syphilis some, syphilis would cause a dementia pattern. Once it reached what we call tertiary stages of syphilis, it's one of the stupidest bacteria ever because it always responds to penicillin. You always hear about these bacteria that don't respond to an antibiotic, you may have heard of MRSA. Well the *treponema pallidum* always responds to penicillin. If you're allergic to penicillin we can treat it with other. So those are potentially reversible causes.

Of the ones that are a little bit harder to reverse, that would include the vascular dementias, but we can modify risk factors for the vascular changes that cause memory loss. Controlling diabetes, controlling blood pressure, controlling high lipids, high cholesterol – we have medications that do that quite effectively. Once the changes have set in, in the brain, from the vascular injury, it's kind of hard to reverse that, but we can try to keep it from progressing. Then we fall into these

neurodegenerative conditions. I'm going to name some for you. Alzheimer's disease; frontotemporal dementia, Pitt's disease is one of those; diffuse Lewy body disease. By the history that I take from the patient and the family, we can start distinguishing between those things. The reversible things we also get by history and lab tests. But, for instance, Alzheimer's, it's mostly marked by memory changes. Frontotemporal dementia, language and personality changes. It will involve memory too, but we see prominent personality and language changes. Diffuse Lewy body disease, where the same kind of accumulations that are seen in Parkinson's disease develop, we can see those changes by history and by exam of movement disorder – stiffness, tremor sometimes, just like you see with Parkinson's patients. So by history and exam, we can try to parse these things out.

I'll mention a couple of other neurodegenerative diseases, one of which has a terrible memory component over time, Huntington's disease. You may have heard of that, Huntington's chorea; Parkinson's disease I briefly mentioned; Lou Gehrig's disease, or amyotrophic lateral sclerosis – those are all parts, different types of neurodegenerative conditions. And in all of them ... Jessica was mentioning these

abnormal proteins that build up across the board in these neurodegenerative conditions, you see protein accumulations. We're only beginning to learn about these in the last 20 years, but these proteins are gumming up our nerve cells or the cells that support those nerve cells like glial cells, and they're bad. And we've got to figure out ways to keep them from accumulating to begin with, or once they accumulate figure out ways to break them down. It sounds simple in concept. It's much harder to get it to actually work in cells in our body.

JJE: And just to kind of go on that, one other way, other than biopsy that is in research trials now, is by ... from University of Pennsylvania the (Inaudible) tracer, so putting a radioactive tracer, injecting, and then doing a type of scan, which would see if those same plaques are in the brain.

BA: Scan, you're talking like an MRI, CAT scan.

JJE: Or a PET scan, so you'd lay still on a table and then it does have a component of radiation to it, but not much more than an X-ray. So, hopefully, if those types of studies show evidence, that we can hopefully use those in regular medicine to help diagnose earlier.

BA: And it's good news that some of these are

reversible.

JJE: They're treatable.

GIW: The depression and some of the pseudo-dementia. So probably if you are concerned, it's probably a good idea to stop in and see your doctor instead of thinking the worst.

JJE: I'd also like to add a severe anxiety to that as well, not just depression, but also severe anxiety can cause people to not be able to think clearly at all, and also mimic. Because if you can't pay attention to something, you never learn it in the first place. And if you never learn it, then you wouldn't remember it. So it kind of triggers that whole sequence.

BA: We're a nation about quick fixes. You know, they have a chicken pox vaccine now. Can I just go in and pop in my doctor's, get my flu shot this fall and then get a dementia, Alzheimer's vaccine?

JJE: No vaccine yet. If only ... I'd be happy to be out of a job. It's in trials.

GIW: They're working on it. They actually have already experimented with vaccines. Obviously, these things start in animals, and there are animal models where amyloid builds up just like it does in Alzheimer's disease in the human brain, and they

actually have had success at the animal level – mice and rats and so forth – using vaccines to components of amyloids, so that your body would fight against it. That’s the purpose of a vaccine. When we go get a flu vaccine, and by the way I just got my flu vaccine a week ago, and nearly all of you in this audience should get a flu vaccine. There’s very rare reasons not to get a flu vaccine. All right. They’re giving you a component of the flu virus, of influenza, that your immune system will react against, and so if you do get infected with the whole virus, your body is already revved up and will fight that invading force, that virus, and so you won’t actually develop the flu. Same idea with a vaccine for amyloid, a component of amyloid that your body will react against it, so the hope is that your immune system will break it down either before it fully accumulates or after it accumulates it will break down the amyloid. That’s sort of the concept behind vaccination. We’re hoping it will eventually work.

The initial, as I mentioned, it’s actually gone to human trials. There are problems with encephalitis, or as the British – I was just in England running a meeting ‘en-kefalitis’ is how they pronounce it in the United Kingdom. So they saw an inflammatory response in these human subjects in the trial, and

they developed an inflammatory response in their brain that we call encephalitis, which is not good. So they're having to like tailor exactly what components are going to be in the vaccine. They're still working on it, and that may be an approach that will eventually be very effective in Alzheimer's, and if that approach works in Alzheimer's I imagine they're going to be trying a similar mode of therapy, perhaps, in some of these other neurodegenerative conditions, like against Lewy bodies or alpha- synuclein, for instance, in Parkinson's disease, things like that.

BA: I want to move on a little bit. Strokes. My dad has had four strokes now. And thank goodness for the clot buster, he tends to bounce back, luckily, every time, but every stroke has taken a little piece with him. And we're starting to see, and it's interesting, you know, the pill boxes are labeled, the cupboards are labeled, there's a list for the day. They're coming up with strategies. Can you talk a little bit about the effects of stroke in dementia? Is any of this reversible? What types of things do you see there?

GIW: Strokes, which actually the fatality, the mortality from stroke – I just want to give you some reassuring numbers – it is still the third or fourth largest killer of humans pretty

much worldwide. Cardiovascular disease is generally number one. Cancer is usually number two, if you take all the cancers together; and third or fourth is stroke. But the mortality rates of stroke have gone down quite nicely. Can anybody guess why? It's not treating the stroke directly but it's treating probably the main risk factor for stroke, which is high blood pressure, and all these new families of drugs that are safer and easier to take, and if your blood pressure is not under control, you need to get it under control, both for risk of stroke and also for risk of heart disease, and kidney disease. So it has gone down.

But the links of cardiovascular disease and cerebrovascular disease, they're very tightly linked with even Alzheimer's disease, so it's estimated that 80 percent of patients who develop Alzheimer's disease, at least the clinical diagnosis, they also have significant cardiovascular disease as well. There's also some evidence that's fairly preliminary – remember, we've been talking about amyloid plaques, neurofibrillary tangles, amyloid plaques are with amyloid, they are right outside the cells generally. The tangles actually build up in the extension, the projection elements of the nerve cell themselves. You can have those build up in your brain and you can be fine, like there have been

accidents, they've done autopsies. They've seen these in humans that were functioning quite well even though they have these buildups. But if you add cardiovascular and cerebrovascular disease changes to the picture, that's where it really seems to precipitate a problem with dementia. So they are linked. We can modify the risk for stroke, as we've mentioned already – get your cholesterol under control, don't smoke, get your blood pressure under control; if you've got diabetes you've got to keep your blood sugars under control. Those things are modifiable and maybe they will reduce your risk of developing something like Alzheimer's disease or stroke. Yes?

BA: If somebody does have stroke is there an increased risk for depression or do they go hand in hand? Are there things we need to look at there?

JJE: Yes. I mean neurochemically there's an increased risk depending on injury to the part of the brain, but also your life dramatically changes, for many people. And so it's environmental changes, it's change in your ability to function, or your ability to shower by yourself or toilet by yourself. Those things are very difficult for people, so there is an increased risk of depression, and we encourage people to get treatment right away

after a stroke. And just to kind of add to that, some people will have significant difficulty with speech or something like that after a stroke, and it often can heal to a certain extent. I mean it may not be back to exactly where it was before the stroke, but they can make a lot of recover, so again, that plasticity factor.

BA: And this may be beyond your knowledge, but if my dad had a stroke, how long afterwards can he continue to make recovery? One week? One month? How long can you ...?

JJE: Could be years for some people.

GIW: It depends on the deficit. If you survive your stroke and again stroke is still a major cause of mortality, if you survive your stroke, most people with strokes do recover some. Some recover better than others. The time period, usually most of the recovery is going to be somewhere between six weeks to six months after stroke. So yeah, people who develop an aphasia, a sever language disturbance from a stroke, usually the left hemisphere – if you're right handed your left hemisphere controls your language. If you're left handed actually both hemispheres have some language direction, some function with language. But yeah, you can see improvement. Usually most of the improvement is going to be around six months. There are strategies and trials

that use things like amphetamines actually, and even drugs that work with NMDA receptors and things like that, to try to hasten and improve the amount of recovery. But it's still something that we need to get better at.

JJE: I was just going to say, after six months you might still have difficulty with language, you might still have difficulty with memory, but we can improve functioning for years through learning specific strategies and using those strengths that you have. So, even if it's after six months, I've still seen people make a huge recovery as far as improving their independence and their functionality.

GIW: I just wanted to mention a couple of things, and stroke is quite common, and I imagine even some of you in the audience may have had a mild stroke in the past, but we've improved the acute care of stroke. You talked about clot busters. The one that is FDA approved is – I'm forgetting the name right now. I'll think of it in a second. I told you I forget names. (Laughter) Alteplase. It's approved up to four and a half hours. Initially it was up to three hours if you could time when the stroke began. Now it's approved up to four and a half hours. It does improve ultimate outcome if you follow patients after several

months, as opposed to not getting the drug.

There are other ways that they're approaching this for people who are beyond four and a half hours. The drug that's given within four and a half hours, it's just given in your vein through IV, but there's also ways they can put in catheters to try to extract clots. Those are not as well proven at this point, but they're still trying to fine tune it. The other ways to improve outcomes with stroke, there are certain cardiac abnormalities that lead to stroke. I don't know if this affected your dad – atrial fibrillation is a common ... I imagine some people in the audience may have atrial fibrillation. That is a major risk factor for stroke, but we can reduce that risk by putting people on blood thinners, for instance. If you have a risk factor for vascular disease, you really, probably, unless you have terrible GI, gastrointestinal issues, you should be on at least a baby aspirin a day. I know I take one. If you have a vascular risk factor – hypertension, diabetes, hyperlipidemia – in addition to taking drugs for those things, you should be on a baby aspirin or more a day.

BA: Hyperlipidemia, is that high cholesterol.

JJE: High cholesterol.

GIW: That reduces your risk 30 to 40 percent.

BA: High cholesterol, high triglycerides?

GIW: High cholesterol, high triglycerides.

BA: I want to go back to depression a little bit.

We talked a little bit about in stroke. I hear a lot about depression, just seems like a catch all term. When is ... you know, we're getting ready to hit winter, it's going to be dark when you wake up, it's going to be dark in the afternoon, it's going to be cloudy, it makes you tired, all those things. When is normal fatigue or those kinds of things – can you just describe depression a little bit more to us, and at what point I would think I would need to stop in, see my doctor.

JJE: Sure. I think with any question, first, about when to see your doctor, I think any question of depression should be brought up with your doctor as soon as you have a concern. And just kind of ... you should bring it up then because if things do get worse the doctor has already talked to you about it and kind of gotten an idea of what's going on now and can gauge if it gets worse over time. But kind of when it affects your life, when you are not functioning, when you're not going out, you're not seeing people, you're not able to work or volunteer like you were previously, because you have a sad mood, you have no

motivation. You don't necessarily have to be crying, but if you have no motivation to do things which you used to like to do, that's a problem.

BA: Would I notice this?

JJE: Not necessarily. So you need to listen to other people. And it's a problem because a point of depression is that you get angry and you get irritable. So when your family member points it out and then you get irritable, it can be a very difficult situation, but trying to have that listening ear and talking to your doctor about it.

BA: I want to go in, and Dr. Wolfe mentioned this, Parkinson's. Can you talk a little bit about Parkinson's and is there any links for memory or anything we should be concerned of there?

GIW: Let me throw out some numbers to give you an idea how common these things are. I'll get to Parkinson's in a second. Alzheimer's disease, I don't know if you recently saw the column by Sandra Day O'Connor, one of our former Chief Justices, she largely retired to take care of her husband who has Alzheimer's disease, and she was writing with a couple of scientists. But we're getting, you know, the population is aging,

and we live longer. We don't live as long as in some other countries like Scandinavia or Japan, but we're living longer. If you make it to 85 – hopefully we'll all make it to 85, some of you are already there – but your risk of Alzheimer's disease at that age is really high, it's about a third, some people say it's maybe even half. It's really high. That gets to the point, by the way, if we can delay the onset, we don't have to cure it, if we can delay the onset of Alzheimer's disease by some of these mechanisms, vaccines, other drugs, by five or six years, that Dr. Szigetzi ... I've heard other Dr. Szigetzi mention this, other Alzheimer's experts, we'll reduce the number of people in the western world with Alzheimer's disease by half, by just doing that, reduce it by half. We're not going to be talking about 30 million people, we'll be talking about 15 million people, stuff like that. That is a big deal. That's all we need to be able to do to really reduce it significantly and hopefully we'll even advance beyond that.

Parkinson's disease, one percent of the population above age 50 or so has Parkinson's disease. It does not usually start with memory problems. The four cardinal features of Parkinson's disease are resting tremor – shaking at rest; bradykinesia – what does that mean? From Latin, we use all these

terms in medicine that are in Latin or ancient Greek derived – brady is slow, kinesia is movement, slow movements, there's a slowing of their movements in walking and things like that; postural instability and rigidity. Those are the four ... postural instability means they often have problems keeping their balance and they tend to fall backwards when they're standing still or even there's a tendency when they're moving and walking and things. And then rigidity, just a stiffness of movement. Those are the four cardinal features.

By the way, Michael J. Fox has a new show on TV, I haven't seen it yet, but I know he got ... he lost in the ratings to some other new show. But he's done amazing things to try to increase awareness for Parkinson's disease and he has his own foundation. He spoke at UB before I arrived in Buffalo, I heard.

Anyway, over eight to ten years Parkinson's disease becomes somewhat less responsive to therapy. It's very responsive to therapy early on, which largely involves dopamine agonists, because the reduced neurotransmitter in Parkinson's disease is dopamine. In Alzheimer's disease there's several, but acetylcholine, ACH for short, is one of the deficient

neurotransmitters in Alzheimer's disease. But anyway, in Parkinson's disease it responds very nicely to dopamine agonists, and also to Sinemet, which is actually dopamine, for a while. It starts becoming less responsive, at that time, oftentimes people start having memory problems as well, and there is a dementia that you can see – not in all Parkinson's patients but in many. It looks a little bit different than Alzheimer's disease, it doesn't respond as well to the Alzheimer's type drugs that we do have available, things like Aricept and Namenda. It doesn't seem to respond quite as well. Those are going to be patients in later stages of Parkinson's and it's tough. It's a tough thing ... stage of the disease.

BA: We recently, in western New York, had a very tragic loss of a young man playing football. Head injuries are severe. I know you talked about the frontal temporal – is that what the football players get sometimes with the dementia? But also head injuries – can you talk a little bit about that? This was a very sad case of a young boy, very unfortunate loss here. But what should we look out ... I don't see any football helmets here but we still have to be careful.

JJE: Right. Avoiding head injury of every type, mild concussions and going on is critical. So risk of falls, now for

people who are aging and trying to age healthy, avoiding ... always wear your seatbelt, obviously. Hopefully I don't have to do that public service announcement. They should just go on, right, automatically. So wearing your seatbelt, having a grab bar in the shower, having the shower stool or seat depending what your doctor would recommend, given your balance issues. Those things are all very important. Not wearing slippery socks around the house, if you have hardwood floors and you are already prone to slipping. Just basic things you can do. Having someone, even paying a neighbor to come and salt your steps in the winter, all worth it. Paying the local paperboy, seeing if you can give him a few extra dollars to salt your steps if you can't go outside to do it, all little things that you can do to really reduce your risk.

BA: And I know Erie County Senior Services is here. They run fall prevention programs, fitness programs, all other types of things that you can do. You can also ... and my wife's a big fan of these decorating shows, and we were watching one recently and they stacked three throw rugs at angles, and I'm just cringing going, "Talk about trip hazards." In one of my previous lives we actually developed and created fall prevention programs and I was amazing ... how many people have lived in

your home for more than ten or 20 years, or even longer? How many people set their kitchen up the day they moved in, and the pots are still down low and things are really high, and you still have your kitchen setup when you had five, you know, all your kids and the whole family in the house, and now if you think about what you use, you know, use the plates, the smaller pots and pans, did you put those where they're easy to reach? You know, those types of things, a lot of times you really ... there's things you could do around the house – look at where cords are, look at throw rugs, you know, those types of things. Actually, you know, putting reflective tape if you have dark stairs. Home modifications can be done very cheap just by moving things around, you know, and that can go a long way also.

JJE: And I encourage people too, if you have any kind of recovery from a surgery in which you go to a rehab facility, often you can have an in-home occupational therapy evaluation depending on your insurance, so it's worth asking just to see if it's an option, where someone will come into your home and look around and see those, look for those hazards and help you kind of point those things out.

BA: And just as a side note, it's nice to talk about

the inside of our home, but our community too. And Erie County is one of the first communities, and the city of Buffalo, in this country, to actually put into effect something called Complete Streets, where they look at the streets, the sidewalks, as all users instead of just vehicles. So we were part of a fall prevention coalition where we actually went out and did assessments. If you find that your sidewalks in your community are not safe, you can actually go to your community and report them and they will go in and, you know, particularly in the cities or in your villages, they will actually fix those. They should have curb cutouts. You should feel safe when you're out shopping doing those things. So don't be afraid to report these.

There's a woman in Oswego, she fell on the sidewalk. She lived in an apartment and she went to the town ... she had insurance, almost all her bills were paid, she had a little bit of co-pay left and she went to the city and said, "You know, I fell on the sidewalk. Can you reimburse me for this? All I get is Social Security." That co-pay was enough to make an impact on her life. And they told her no, because no one had reported that sidewalk. So she spent the next two years walking every sidewalk in the city and reported everything that was done and she's ... could have

gave me \$50, now you are on notice that you have to repair every sidewalk where there is an issue. And actually in this community we went in and did assessments in ten communities in Erie County and they were fixing curb cutouts, there were pipes that were sticking out of the sidewalk. So these are things you could report back into your community. You should feel safe instead of saying, "Gee, you know, I don't go there anymore, the sidewalks are bad," or there are steps to this and that. So, again, think about fall prevention even well beyond your home and just the fitness level.

I do want to get into – this has sort of been depressing – what can we do? I think there's opportunities to take control. What can we do to age successfully? First of all, look at all the folks who are here. This group of folks is interested not only to find out what should I know, what should I be concerned of? Where and what, when should I see my doctor? Who should I see? But now, how can we do this safely and successfully? What kinds of things can I take control of?

JJE: So there are four kind of key components to successful aging that the National Institutes of Health kind of developed and goes by. One is that you want to increase your mental activity or how intellectual you are, and address that

cognitive functioning. Some of those – we'll talk a little bit more about this, I think. Some of those programs you've seen on TV, the compute programs like Lumosity, I believe it is, or other brain games like the handheld computers or internet games or on your computers. Those are good but the actual hands-on stuff is more important.

BA: So I if I have my tablet and my Kindle, my Nook and I'm playing a game, that's good. But if I'm printing out my Sudoku and then enlarging it so I can actually see it, that's better?

JJE: They're both good. I think it's a little bit better, and even better than that, to top it, is when you interact with another person because you're actually using more cognitive functions in various regions of the brain that has shown, research has shown that it increases that kind of plasticity, or improves, because you're not only being social but you're also using various functioning. So volunteer, go to a museum, go to lectures like this. This is awesome, everybody give yourself a pat on the back, because that's important. But these are all very important things to help age successfully. So that's the mental piece.

BA: And I just want to go onto that too. Like I

said, I'm the Associate State Director for AARP, I cover a 30-county territory, everything from St. Lawrence County to this side of Syracuse, and you have one of the most, I think, unique programs run through senior services and through RSVP, if you haven't stopped by it's the University Express. Has anybody here attended a program through the University Express? If you haven't, you should. These programs are free. There's everything from history and heritage to current affairs, anything you can think of, and they're done – there's a list -- several times a year. They're done all over the county. Great place ... current affairs, and you can just stop over at the table in the corner. Lifelong learning, I think I heard mentioned earlier, I never stopped developing memories and learning.

JJE: No, never.

BA: And those are good, right? They keep my brain plastic?

JJE: Absolutely. That problem solving, that critical thinking, the meta memory is also so important to keep. It's like going to the gym but for your brain. You need to keep working it out and learning new things.

BA: Before we move onto the next one – sleep.

How important and necessary, you know, sleep cycles change, medications can affect sleep, all different kinds of things. Can you talk a little bit about sleep.

JJE: You want to talk about changes?

GIW: Sure. The most sleep you need in your life is actually when you're born. Newborns need more sleep, 12 hours of sleep a day, something like that, even more for newborns, and then it decreases. As you get older you actually need less sleep now to function than you did 20 or 30 years ago. It's true, your sleep pattern has also changed, the different stages. You have less full REM sleep, which is often considered the most restful components of sleep. You just get less of it as we age. But your total number of hours of sleep, instead of needing eight yours, you know, seven, eight hours is often recommended for younger to middle-aged adults, it goes down to six or seven as you get older.

One thing that's harder to maintain – well, it's hard to maintain throughout life. We're busy and so forth, but sleep hygiene, where you have a consistent pattern of when you go to sleep, when you wake up, the behaviors you do before you go to bed. It's hard to do that, but as you get older, because our sleep tends to be more fragmented, there's less REM sleep and so

forth, you really need to concentrate on good sleep hygiene. If you're taking multiple naps at different times during the day, or falling asleep – that is bad. You're going to have problems with insomnia, I can almost assure you – initial insomnia, trying to go to sleep, or terminal insomnia where you're waking up in the middle of the night and then can't get back to sleep. Late exercise is not a good thing, late caffeine is not a good thing. Most people say late, late alcohol is probably not the best, it affects your sleep cycle patterns as well.

But there are some things that that you can consistently do to try to reduce your sleepless nights. I think exercise helps as long as it's not too late. I'm not saying don't drink caffeine, but think about when you're actually consuming caffeine. You may want to stop after mid afternoon and things like that.

TVs in the bedroom, bad. Sleep experts say ... you know, most Americans, I think, have TVs in the bedroom. I don't. That's not where the TV is supposed to be. It's supposed to be in the family room. People argue about reading. I think if I can't get to sleep I usually will pick up a boring history book or something like that. That helps me get to sleep. So there's things

like that.

Sleeping pills, generally not a great idea.

You become dependent on them. There are some that are safer nowadays, but I think we have too much dependence on things like that.

JJE: I just wanted to add onto the caffeine thing, sugar, because I see this a lot in patients. They're like, "Well, I didn't have any caffeine." "Did you have any snacks?" "Well, I had a big bowl of ice cream and then I tried to go to bed." Well the high sugar can also keep some people (overlap) ...

BA: So how many people actually think about sleep hygiene? Really? How many people are going to think about it tonight? What did you have before you go to bed? Look at the type of snack you had, when your last cup of coffee or tea was, your activities. If you're out, you know, folks may go out and do yard work yet this afternoon or do some things and then want to take a nap – try to avoid that. So add this into your repertoire of things you can take control over.

JJE: Absolutely. And if you do use the internet and like to research, there are some good websites. The University of Minnesota, if you Google 'sleep hygiene,' that one

should come up. It's usually one of the top sites, as well as the Mayo Clinic also has some very good information and tips. Just kind of reiterating the things we spoke about.

BA: We started off with a brain health warm up, a fitness warm up, physical activity is very important. You see everything on TV, it's got to be 30 minutes of vigorous five times a week – what do we need to know? What's acceptable? If I get out and walk three to five minutes five times a day, is that okay too? How does this play a role?

GIW: General recommendations, and I see a lot of patients, even with muscle and nerve disease, and we try to get them to exercise as well, even with those types of problems, but general recommendations, you know, 30 minutes of activity, and it could be broken up during the course of the day. You really need to do it ... I used to be at the medical school in Dallas at University of Texas, Southwestern, and Ben Levine is one of the world's leading exercise researchers, exercise physiologists. The real benefits of exercise, it's really not three times a week. You've really got to schedule probably about five times a week. So it's almost daily, but it can be a variety of activities, whether it's walking, brisk walking ... I generally tell my patients, many of

whom are older, unless you really are into running and safe running, that's not the best thing, or even treadmills, but things where your feet are not actually leaving the surface like ellipticals or exercise bikes. Swimming is the second most effective, efficient form of exercise, if you have access to a pool and know how to swim and like to swim, after running, as far as use of calories. And a lot of people, you know, as we get older ... America in general needs to lose weight, so swimming is a very, very good exercise. So those types of activities are very, very good. And it is five times a week, about 20 to 30 minutes, try to build up to that level.

BA: And it can help with my depression?

GIW: Yes.

JJE: It can absolutely help with depression.

BA: Anxiety?

JJE: Yes, reduce anxiety.

BA: Energy level?

JJE: Yes.

BA: Blood pressure?

JJE: Mm-hmm.

GIW: Absolutely.

BA: So a lot of the things we talked ...

GIW: Cholesterol.

BA: Does it help my brain?

JJE: It does help your brain. It also helps you to think clearer because reducing all those factors helps you to think clearer, which hopefully also makes you feel like you are functioning better and you have improved cognitive functioning. Your memory may feel better. Your attention will feel better. Actually, research has shown that your attention is at its peak 30 minutes after cardiovascular exercise. So I mean that's what we recommend to kids and students, but think about that as well, you'll be really at your peak. So you go for a walk, you come home, you have a snack, you pay your bills. You're going to be at your sharpest. You're going to feel like, "Okay, I can tackle this a lot better."

GIW: The other thing I want to add, if you don't exercise, I look at muscle biopsies, that's part of what I do in neurology these days, if you don't exercise for two or three weeks, that's it. Two to three weeks, you already see atrophy of some of those muscle fibers, the type two muscle fibers start decreasing in size and they cannot provide the type of contractile force to generate strength as well. That's inactivity just for two to three

weeks. It's really important, you know, that's why I think it's crucial for younger people in college and so forth, that they build up this life plan and this habit of physical activity. It's harder these days than in pre-industrial ages where there was a lot of manual labor, there weren't cars to take us from place to place and so forth, to really try to build in that physical activity daily. But we really need to do it. It's not bad for us to be physically inactive (sic). We were not designed to be physically inactive and dependent on cars and wheelchairs and things like that all the time.

BA: Social engagement, getting out, connecting with people. We know it's great. Love to see my friends, love to meet folks. Beyond that piece, is there any importance to it in terms of my brain health?

JJE: Yeah. Research has shown that, again, kind of going back to that plasticity factor and the increase in synaptic activity, it doesn't ... it can improve your ... various parts of your brain can actually almost work better in some ways by increased social engagement. So getting out, engaging with people, talking, volunteering, all important. It reduces depression, reduces anxiety. It's also physical activity. If you could put those things together that's great, going for walks with people. And when you do those

things you also want to make them as diverse as possible.

BA: And I do know, though, we all know people who are socially isolated and that does become a risk factor. And I actually had the opportunity this week to participate with the Post Office, United Way, Erie County Senior Services and Senator Kennedy, we just launched a program, just in Erie County, called the Carrier Alert Program, and you can pick up these flyers back with Erie County Senior Services. If you know someone who lives alone, maybe, you know, we know family members have to move for jobs, whatever, if you know someone who is alone or disabled, you can actually sign up through the Carrier Alert program, that their postal service person will sort of keep an eye on them. If anything doesn't look right at home, if the mail is stacking up or something doesn't look right with the home itself, they actually will call Erie County Services and have someone come out and check. So if you do have someone that you're concerned about because they are alone a bit of the day, you can sign them up, it's free, anybody can sign it, to sign up, anybody in Erie County. We're hoping to take this program across the state.

JJE: That's great.

BA: Clinical studies. We talked a little bit about

this earlier. Can you talk anything about the research, first of all, in a language that I can understand. We got plaques and tangles, which is the gum in the hair. Those are the things that we want to start to look at. Brain plasticity. What types of things are out that they're looking for in the future? What's the latest and greatest?

GIW: A lot of the strategies do involve trying to reduce these accumulating proteins and there's growing evidence that amyloid really is one of the first stages that leads to dysfunction of neurons of the brain cells in Alzheimer's disease. I already mentioned the vaccine to try to like break down amyloid that's accumulated or perhaps even keep it from accumulating. There's other strategies as well that are under study. Amyloid doesn't just start as amyloid. It gets cleaved. It's derived from what's called APP, that stands for amyloid precursor protein. We all have it in us. And at least when you're younger, middle age and so forth, we clear its products, the amyloid. Amyloid precursor protein becomes amyloid through two enzymes that are called secretases, beta secretase and gamma secretase. If we can block those enzymes we may reduce amyloid production to begin with, so that's another strategy is to keep it from actually being formed in the first place. So there's pharmaceutical companies that are

interested in coming up with ways to block the secretases. Hasn't worked out yet quite well, but hopefully it will down the road.

Nerve growth factors. They've tried them in a variety of neurodegenerative diseases. Lou Gehrig's disease there's been quite a bit of studies; diabetic neuropathy; with nerve growth factors. These are the chemicals that make our nerves want to grow. We all have them in us. BDNF is one that stands for brain derived neurotrophic factor; we call it BDNF for short. There's attempts to look at those types of chemicals as ways to sustain cells or even make new cells potentially.

Other strategies. There is an inflammatory response, to some degree, in Alzheimer's disease. There often is in neurodegenerative disease, when these abnormal proteins build up and the body is struggling, not very successfully, but trying to clear them. Sometimes inflammatory cells get involved and may cause more injury actually. And so there's ... looked a drug which recently failed, unfortunately, intravenous gamma globulin, which I use in other diseases like myasthenia gravis and certain neuropathies. There have been studies, trials now in Alzheimer's disease. The initial studies were positive, the larger studies didn't end up showing an effect, but that's another type of strategy to try

to block some of these inflammatory pathways that may end up working.

Other studies that are sort of before treatment, which are ongoing here in Buffalo with Dr. Szigeti's lab, she's looking at healthy volunteers, patients who only have mild cognitive impairment, and those with actual dementia, looking at their blood and looking at their cells to look at their genes for what's called copy number variation, and she has a certain receptor called the olfactory receptor that she's studying very closely. All proteins are made from genes so she's looking at the gene control of that receptor. A lot of patients with Parkinson's disease and Alzheimer's disease, by the way, lose their sense of smell. The smell areas of the brain ... obviously it starts in your nose. Where does it project? To the temporal lobes entorhinal cortex. That's also the same area, the same neighborhood where our memory is stored, in the temporal lobes. And so she's looking at that and she has ongoing studies that you may be interested in, to look in different populations of the copy numbers for these different genes, are different. And if perhaps there's a way we may predict with these types of genetic studies, it's easy to get genes. You can get them from a swab in your cheek to actually do genetic

studies on.

But there's a way to predict who might end up going onto Alzheimer's disease and so you could actually introduce therapies early on. I think a lot of these diseases, early on – it's the same with cancer – the earlier you find it, or some predisposition to developing it, the more likely we'll be able to have an effective management technique, so these are things that are underway, actually, in Buffalo.

BA: A lot to look forward to. Hopefully, these are going to be successful. Before we go onto questions from the audience, nutrition. We heard watching your sugar before you go to bed, watching caffeine intake. We know eat your veggies. Is there anything you want to add in, in terms of nutrition.?

JJE: Obviously, making sure that you're getting vitamin D, vitamin B, the various numbers of B's and D's, and asking for those blood tests when you do go to the doctor is very important. Unfortunately, not all primary care physicians just run those. So asking, "Are my vitamins ...," even if you could just remember, "Can I get my vitamin levels checked," when you go to get those blood tests, because they do have quite an effect on cognition. As Dr. Wolfe was saying as well, your thyroid. But

trying to have the green, leafy vegetables, I believe are the biggest source of some of those vitamins, right?

GIW: And meats, chicken, red meats, things like that, for B12. Those are easy blood tests, simple.

JJE: And if you cook some of the vegetables you'll lose some of those nutrients, so trying to eat the raw vegetables and fruits as much as possible.

BA: Before we go to questions from the audience, did I forget to ask anything? Is there anything ... if you could tell folks, when you leave, here's your top things, or some things I heard – sleep hygiene, think about the details when you go to bed; it's good to be refreshed; watch your nutrition; getting to your doctor early for any concerns; look out for your friends too, those types of situations. Is there anything else you'd like to add?

JJE: One quick thing too, thinking of it with the research trials, in addition to the ones that the University is doing, the Alzheimer's Association is here and also has large trials as well and I know that they have cards that you can sign up for in the back. So you can do all of those research trials if you're interested, possibly, and a good candidate. So that's one more thing. The Alzheimer's Association also has wonderful support groups as well,

and their website is really informational for all stages including the mild cognitive impairment, or just some of those senior moment memory loss things. If you have questions on it, that's a great resource.

GIW: Risk factor reduction, pretty simple, you know, get your blood pressure under control. If you have diabetes, and the number of patients in the United States with diabetes is increasing. Some states it's more than ten percent of the population; no state is less than five percent of the population with diabetes. Now the last state that had a CDC acceptable rate of diabetes was Colorado, and they've recently gone over five percent. So every state in the union, we have too much diabetes, but get it under control, there are good drugs for that. Keep your cholesterol lower. The guidelines keep lowering for what a healthy cholesterol is. It used to be 200, now they really want you below 180. Same is true with blood pressure, to really be quite a bit below 140 over 90, be more like 130 over 70. There are plenty of good families of drugs for that.

Don't smoke. Mental activity, physical activity. Engage with others. Play cards. If you liked chess when you were 20 years of age and you played chess in college and you

haven't for a while, pick it up again, it's a great game. Be interactive with others. Go to museums. I think the Albright-Knox has like often programs, and so does the BPO, where the music director or the artistic director explains a show that's opening. They're often free. Go to those types of things and be involved. And again, the physical activity is crucial.

JJE: I think kind of an important tagline on that is "Use it or lose it." I tell people, "Use it or lose it," both for your cognitive, mental activities as well as the physical, the muscle. You need to exercise your brain and your body.

BA: We're going to audience questions. Simon is a gentleman in the back. I just have a question. Are people going to line up or is somebody going to bring a microphone to them? Here we go.

(END OF TAPE)