

[MUSIC PLAYING]

**ROLLIN M.  
WRIGHT:**

Just want to say that I have no relevant disclosures to make. And again, this is even more tips on how to live long and prosper, the geriatrics 2017 year in review. So we are going to start with a poll so that you guys can practice. Get your thumbs ready. Get your smartphones out.

The question is, which of the following did not originate in or near Pittsburgh? The emoticon, option a, the Klondike bar, option b, the Big Mac, option c, or the Mars bar, option d. So however you choose to answer, you had three options, plug in your answer. And if you forgot what those three options are, you can just default to this one right here. OK, I'll give you another couple of seconds and then I will lock the poll. Five, four, three, two, one.

All right, let's see what you said. So the correct answer is the Mars bar did not originate in or near Pittsburgh. Although one would think that Mars township might have been the inspiration for that particular candy bar, that was not the case. All right, so the learning objectives are as stated. You can read them in their syllabus.

Basically, they reflect the highlights for the main papers that I'll be discussing today. For my search strategy, to figure out what are exactly the most important papers in 2017, I start out by asking my colleagues and await, with bated breath, their advice, their input. I look at the table of contents, searching for aging-related papers of many, many journals. I also look at hot topic areas, areas where I'm hoping there's going to be an answer this year, like what is the most appropriate nutritional supplement to give to my older person? Which one is going to reverse frailty and restore youth and vitality?

That paper did not come out in 2017, but I'm still-- I will look for it again next year. Then the search limits were between, again, January 1, 2017 and December 31. My other search strategy, sort of my ear to the ground search strategy-- and this is, you know, since I don't have a lot of time to peruse in 19 different journals, I kind of keep my ear out to, basically, to NPR and the popular press. What kinds of aging-related papers are bubbling up in the popular press? What are people talking about?

So the ear to the ground strategy pretty much informed most of the papers that I picked to talk to you about today. All right, so the rubric for the year for any of the papers is a topic area, quality of this study, relevance to you guys, to the audience, whoever's in the audience. Does it impact lifespan or health span? Dr. Foreman just talked quite a bit about what's the difference between the two. And I'm going to aim towards improving health span not lifespan. And will it or should it change practice.

Here's your next question to prompt you to listen carefully to the presentation of the first paper. Which of the following statements about the impact of sedentary lifestyle is false? And I'm going to read them out because there's a lot of words here. The dose of total sedentary time in a day is associated with all cause mortality, independent of amount of moderate to intensive physical activity. So you can have all the moderate-- you can have a lot of moderate to intensive physical activity, but if you sit around a lot, it's going to eliminate the benefit of all of that activity.

Option b, people with the highest volume of sedentary activity or highest dose, that's how they talk about it, are more likely to smoke, have a larger BMI, be older, black, and less well educated. Option c, a higher dose of total daily sedentary time and longer mean sedentary bout time, meaning like-- we sit for bouts of time. Right now you guys are probably in the middle of about a 10 minute bout of sedentary time. And I will end that bout of sedentary time in just a minute. So is associated with increased all cause mortality.

Higher total daily doses of sedentary time, option d, combined with shorter sedentary bouts confers higher mortality risk than the lower doses of total daily time sitting down with longer sedentary bouts. So it's kind of a mouthful. But it's going to get you prompted to get to the next thing. So going to give you a few more seconds. Five, four, three, two, one. And so the correct answer is, we'll see here.

So I forgot to close the poll. You guys still have time to pick the correct answer. So the correct answer is b. And while that is a true fact about risk factors associated with higher sedentary time, it has nothing to do with the impact on lifestyle. So that is why it is the correct answer.

All right, so why did I get into this here? Was it one of those ear to the ground stories in the popular press? Sometime in the fall there was a lot of talk, a lot of buzz about this paper, patterns of sedentary behavior and mortality in US middle-aged and older adults. And so the premise of this is that sitting is the new smoking. And all of you are guilty right now. So risk of sitting is eliminated only by 60 to 75 minutes per day of moderate to vigorous intensity physical activity.

And so what does that really mean and how do you calculate moderate to vigorous? And if I'm dusting my house, is that light, moderate, or vigorous activity? We'll get to that. So most-- so most of the data or most of the papers that report on sedentary activity, use self-report data. And so these two studies are getting a little more involved than that. And they look at total sedentary time not patterns of accrual, so sitting for short versus long periods of time.

So what should guidelines about sedentary behavior recommend? And so the purpose of this first paper was to examine the association between objectively measured sedentary behavior, total and prolonged bouts of accrual, and all cause mortality. So all cause mortality is the outcome or endpoint. This was a prospective cohort study. The participants were all black and white adults over the age of 45. Now that may seem young, but I want you to know that age comes into play in just a minute. You'll see where that gets to be pretty important.

And for those of you who are in the 45 to 55 or younger adult period of time, that-- I'm just letting you know, you still have time to make it better. So that, you know, that's the appeal to this particular audience. So these folks were enrolled in the regard study. And they wore-- there was a period of time in this study where they wore something called an accelerometer. And to qualify for the study, or to be included in the data, they had to wear it for 10 hours a day minimum for four days in a row between 2009 and 2013.

And then there was follow up data for this particular cohort, which they analyzed. So they measured energy expenditure. And this is called counts per minute. I don't know if you know how an actigraph or accelerometer works, but it's this little device pictured here in the bottom corner that you wear on your belt or somewhere on your person. And it actually measures the tilt of your body, the velocity at which you're traveling, and vibration.

So it counts all of these things toward measuring the intensity of the activity that you're doing. So these folks had to wear it while awake for seven consecutive days. And so all these activity counts were occurring in one minute epochs. So if I had you guys stand up and sit down, you would briefly have a little burst of activity. But unless it's sustained for at least a minute, it doesn't count.

All right, so a count is a measure of activity. Sensors in the accelerometer detect what I said it detects. Here's some examples of light, moderate, and high intensity activity. So walking at 2.23 meters per second at a 3% grade will get you pretty high intensity activity. On the other hand, dusting gets you near 360 counts a minute of activity. Sweeping is technically considered light activity, for example, it's 575. And in the definition used in this study, gardening would be more moderate.

So in this particular study, they counted moderate intensity activity is activity getting a little over 1,000 counts per minute. That's important because the definition of moderate intensity activity changes for the next study. Going downstairs, you'll be glad to know, gets you more counts than going upstairs. So whenever you see some stairs, just go down the stairs. You don't have to bother with going up. Just take the elevator and just keep going down.

So how do we really interpret this data? And this is what an actigraph output looks like. So to orient you to this fuzzy slide, which I know is not in your syllabus, so don't even bother looking at your syllabus for this because it ain't in there. It's looking at the motion for different areas of the body, upper arm, lower arm, trunk, and upper leg. And then it has different types of activity. So you can see, like if you're waving, your arms are generating a lot of activity count but your legs are doing nothing.

If you're throwing a ball, that actually involves motion of your whole entire body. If you're lying down, not a whole lot of activity, not a surprise. Here's where the surprise is. There's a little more activity with sitting than with standing. So yeah, exactly. So as I'm standing here, unless I am dancing while I'm talking to you, this is a sedentary activity, standing and lecturing, just like it is with you sitting and listening.

So again, just some food for thought. Those standing desks do not count as actively working with your body. It is not actively engaging your body, even though it's a great idea for posture and other sorts of things. So we've talked about what the definition of sedentary activity is.

So how did they get that over a 24 hour period of time over several days? So non-wear-- meaning like zero activity for-- so if there was zero activity, zero movement at all for at least 150 minutes for 2 and 1/2 hours, then it was considered like they weren't wearing the actigraph. So again, they're looking for a certain number of hours a day of activity.

Sedentary is when you're generating 0 to 49 counts per minute. Light intensity activity is 50 to 1,000 counts per minute. Moderate to vigorous is over 1,000. And a sedentary bout is a number of consecutive minutes of less than 50 counts a minute. A sedentary break is when you break the sedentary force field and you become active for at least a minute, and that you're generating at least 50 counts per minute.

So now that we've gone through all of that, you guys are prepared to understand the rest of the data. All right, so they looked at-- they took all this data and they divided all of the activity counts into quartiles. And they really honed in on that quartile that has the highest dose of sedentary activity. And they wanted to look at what risk factors were associated with it and what were the outcomes like.

And they did some secondary analysis with a dose response relationship between each sedentary characteristic and all cause mortality. So what were the results? People were sedentary 77.4% of their wear time. That amounted to about 12.3 hours a day in a 16 hour day. Sedentary bout length, on average, was about 11.4 minutes, which is a little shorter than I would have thought. But I guess we're all a little innately wiggly and we need to get up more than I thought we would.

Bout lengths that they looked at, so they look at percentage of sedentary time accumulated in bout lengths. And so most people, a little over half, spent their time in 0 to 29 minute bout lengths. About a quarter spent or a fifth spent a bout length time at 30 minutes to an hour. Very few people, relatively speaking, had a sedentary bout of greater than an hour and a half.

Mortality was measured 340 out of nearly 8,000 participants. So 4.3% died in this time period. And they looked at total sedentary time and longer sedentary bout time, finding that the larger the dose of sedentary time and the more time you spent sitting in one place at a time is associated with increased risk of mortality. So there is a dose dependent association with higher risk.

All right, so I'm not going to go over this in a great amount of detail, but here are how the quartiles shook out. So the least amount or the smallest doses of sedentary time was less than 690 minutes in a day. 690 to 746 minutes in a day was quartile two. The highest dose of sedentary time was, on average, close to 800 minutes per day or more.

Here's where the age part comes in. The folks who were in the highest doses of sedentary time were the people who were older, more likely to be African-American, higher BMI, more likely to have diabetes, and all these other co-morbidities. The mean age at which the folks in the study were wearing the-- who had the higher doses of sedentary time was 75.

And then just down here, mean sedentary time per day in this highest quartile is 841 minutes. That's a lot of hours of sitting down. Mean sedentary bout duration is 20 minutes in this particular quartile. That's very, very sedentary. The amount of mean light intensity activity in that quartile is less than 100 minutes of light activity per day. That's not very much activity.

In the other quartiles, you can see there's a little bit more light intensity activity. And then when you're looking at heavy intensity activity, again, getting more than-- moderate to heavy-- getting more than 1,000 counts per minute, that was only occurring for less than three minutes a day for the folks in this.

So it's kind of astonishing, but these are our patients. And this is what's happening out there. The only point here was to have you guys look at it a little bit different way. This looked at the length of sedentary bout time and the highest quartile was going to be the bout times of greater than 12.4 minutes.

And here's the punchline, obviously the folks that are in the fourth quartile have a lot higher risk of mortality. It's dose dependent risk of sedentary time and higher mortality. So the clinical bottom line is large dose of sedentary time and long bouts of sedentary time are associated with mortality, regardless of your physical activity level. Interrupting shorter bout, or having shorter bouts of sedentary time may help a little bit.

And so again, the quality of study is very good. Impact on the health span versus lifespan, yes, both, potentially. Relevant to all of us? Yes. And should it inform practice change? Probably. So here's just some food for thought. These are rhetorical questions, things for you to think about. How are you going to build sedentary lifestyle-- the threat, the danger, the imminent danger of sedentary time, how are you going to build that into your conversations with your patients?

And it's got to be more than, OK, you need to exercise more. It's not that you need to exercise more. It's that you need to sit less and sit for shorter periods of time. How do we talk about that? And how do we advise them? Like how is it that you're going to plan on-- let's come up with a goal for you to be less sedentary. How are you going to do that?

So again, stuff for the future. So now that I have you guys a little bit worried about your own mortality risks, here's a chance for you to stand up and break the sedentary plain. Go ahead, do it. It's OK. Break your sedentary plain. I'm putting the fear of God in all of you. And then you're going to think about, and I'm going to make you do this for a good 30 seconds so that you get some activity counts, the more you move, the more counts you get, right?

And I wanted to put a .wav file with music in here so we could all dance during this time but I was not successful. All right, so you have successfully broken sedentary, excellent, after about 15 minutes. All right, so next question, how does sedentary lifestyle translate into disability? Because kind of the next obvious question, right? So here's a chance for you guys to think about this. What is the minimum amount of additional activity I need to do, or my patients who are at high risk of disability or debility, what's the maximum amount of time of moderate to light intensity activity they have to pack on to what they're already doing in a day?

Is it baseline activity level plus 23 minutes? Baseline activity plus 33 minutes? Baseline activity plus 43 additional minutes of activity? Baseline activity plus 53 minutes? Baseline activity plus an hour of additional activity a day? That's a big dose of activity. All right, and I'll close the poll in just a moment. Five, four, three-- everybody get on their smartphones. Get your voters out. You guys are getting to vote. This is a more fun thing to get to vote for than some of our recent polling experiences.

I'm going to lock the poll now. And what say you, audience? And so you are, in fact, correct. So I'm going to assume that all of you have wised up and you've figured out the way to get the right answer is to look ahead in the slides. And because the polls are already open, I can put in my answer for the next quiz question she's going to ask right now.

I can cheat, so cheaters, all of you. All right, so the dose of physical activity and physical function and disability risk and mobility limited older adults is, these are results from a live study which Pittsburgh is a site for. This is a randomized controlled trial. Again, sitting is the new smoking. Physical inactivity, in other words, sedentariness predicts physical disability. What is the minimal dose of physical activity needed to reduce the negative outcomes?

So what is the least amount of work and activity that I need to do to get away with reducing my risk of becoming more disabled, mobility disabled? So the purpose is to examine whether the differences in the dose of physical activity. So we're flipping it around now. We're now not looking at the dose of sedentary experience, we're looking at the dose of physical activity needed to reduce bad outcomes. So what is the minimum amount of dose and how is a dose of physical activity associated with improvement in physical function and reduction in disability incidence?

Multi-centered randomized controlled trial, there were about 1,000 participants aged 70 to 79. They were considered inactive, so less than 20 minutes of basically light to moderate-- or moderate to heavy intensity activity a week. And these are all people who are on the fringe, on the brink, of having mobility disability. They could not have cognitive impairment. They had to be able to walk 400 meters in less than 15 minutes. And they could safely participate in the trial because, again, the intervention is something to increase activity level.

And so they were randomized to physical activity versus the control group, which was a health education intervention. So the physical activity program, they did walking-based aerobic resistance stretching balance training in class at least two times a week. They also had some home-based activity goals. So you wouldn't have a spotter on you all the time during the week to make sure that you were staying active. You sort of had a promise, a commitment, that you'd go to the classes and you'd be active there. But you're going to be active every day.

By the way, does anybody know what the World Health Organization guidelines are for how active we all should be? And what they say is that we should all have, all adults should have at least a minimum of 150 moderate to vigorous intensity activity minutes per week. And if you're not able to sustain moderate to vigorous activity, if you don't have that-- you know, if you have more time, then you can do light to moderate intensity activity for 300 minutes a week.

So that's a lot of minutes of activity just for us to stay healthy and do what's expected. In this study, the goal was to have each of the participants spend at least 150 minutes per week with moderate intensity activity. The health education intervention was a weekly session for 26 weeks, then twice a month, where they got educated about activity. And then they had some-- they also had the opportunity during these sessions to do some brief seated upper extremity and flexibility exercises.

So they-- the endpoints that they used to measure whether or not physical activity improved these outcomes associated with disability were to look at a change in their performance on the SPPB, the change in their ability to do, and speed, for doing the 400 walk test. So gait speed test, changing gait speed. Accelerometer, how many-- how many activity counts were they doing?

Self-reported physical activity, and then number of hospitalisations to measure into current illness. They stratified that by a change in physical activity from baseline to 24 months, and by intervention arm, they looked at changes from baseline to six months, 12 months, 24 months. And again, the outcomes were, as I mentioned, change in these measures.

So here's something that's kind of interesting. And I think this is-- this slide, I'll dissect it for you. You don't have to worry about looking at the numbers. But the punch line is that we have great intentions. And just like with our New Year's resolution, we're going great for the first month and we totally fall off-- fall off the wagon by the end of the year.

So that's sort of the moral of the story here. So they had the greatest amount of change or improvement. So added 31 minutes of physical activity at this moderate intensity. So they defined a moderate intensity activity at 760 counts per minute, which in the other study was considered light, just letting you know. So you can get away with more in this study. So folks increased, in the intervention arm, increased their level of activity at six months by 31 minutes.

But look at this, by two years they actually were less active than they were at baseline. So we got to do something to keep people more engaged. In the health education or control part, they did less and less and less as time wore on. So change in minutes of self-reported walking plus weight training, so again, there was the actigraph measures of how active they were and then there was the self-report stuff of how active they were.

And so in the beginning, so they were actually better at maintaining that. So they did 151 additional minutes of walking by six months. And they still maintained more walking than at baseline by two years. And same story-- same story for the health education one, only look at how much less walking they did. So they all walked more than they did at baseline for all three measures, all three time points. But they walked only about a half an hour a day as opposed to 2 and 1/2 hours a day for the other arm.

So in terms of outcomes, the most measurable or most important outcome was looking at how many minutes per week did you have to do to get the most benefit. And so it showed a measurable benefit or improvement in gait speed at more than 43 minutes per week of, again, their definition of modern intensity activity. The other measures did not really change too much. So the conclusions were that they were able to get a measurable increase in activity in the physical function in the physical activity arm.

They had a greater increase in self-reported and measured moderate intensity activity. There was a robust decline in incident mobility disability in the physical activity arm. The minimum dose of moderate intensity exercise needed to reduce your risk of disability was about 43 minutes per week over your baseline. And to get the most bang for your buck, you did much, much better if you got 48 or more minutes.

So I think the conclusions, or the bottom line, is pretty clear, the benefits of physical activity are pretty high in terms of reducing incident mobility disability. Next question, in a recent study, how many patients who were greater than 65 years old without a diagnosis of dementia who were being evaluated prior to elective hip and knee surgery were found to have probable cognitive impairment?

So these are people who showed up to get their bionic body part, saying I need a new one of these, but they showed up without a diagnosis of cognitive impairment. How many people in this study showed up without a diagnosis of cognitive impairment but ended up with one in their pre-op eval?

So I'm sure that some of you cheaters have looked ahead to find out what the answer is. We'll find out who did that. Ready? Five, four, three, two, and one. So, in fact, a bunch of you felt that the number was quite a bit lower. And so it turns out that the prevalence of cognitive impairment using a mini cog test was 24%. So a quarter of the folks who showed up to get their bionic body parts were cognitively impaired even though they did not have a diagnosis of that. What does that mean and why is that important?

So this is a study out of Mass General. And Deborah [INAUDIBLE] is a surgeon there. And she was really-- they do lots of surgeries on older people. So she found that-- she looked at poor performance on her pre-op cognitive screening test predicts post-op complications. And that's pretty important. I know that a number of you are doing pre-op evals for your patients to get their bionic body parts all the time. So I'm going to ask-- I'm just going to plug for you guys to fold a mini cog into that so that you can plan accordingly when they get their surgery.

Doesn't mean they shouldn't get the surgery, just means you need to plan accordingly. So the usual pre-op evaluation looks at assessment-- or assesses how vital organs are doing. And those vital organs are typically thought to be the kidneys, the heart, and the lungs. We don't really pay attention to the brain, which is a pretty vital organ. So how do you assess brain function in a pre-op eval?

So prevalence of cognitive impairment, however, is very, very high. And is like constantly under-recognized by PCPs and families. Cognitive impairment will predict peri-op complications. And so the American College of Surgeons and the American Geriatric Society have already issued joint guidelines about pre-op cognitive function screening but we're still not doing it. So maybe after today, more people will do it.

So the purpose of the study was to examine the relationship of a low pre-op mini cog score in patients over 65 without a prior diagnosis, and compare that and see what their post-op morbidity and outcomes with lower extremity joint replacement turned out to be. Prospective observational study, these were, again, 65 plus year olds getting a new hip or a new knee.

Interestingly, they surveyed all these patients, all these participants, about how would they feel about having their cognitive function assessed? Because we're kind of, well you know, I don't want to embarrass them. I don't want to make them feel stupid. So I'm not going to assess that. And so you'll find out that 90% of them didn't mind having their cognitive function assessed. So they're OK with it. So do it.

They had a number of tests, the outcomes were discharged to place other than home, incident delirium and other complications, and length of stay were the big ones. They looked at 30 readmissions and 30 day mortality. Here is a mini cog for those of you who don't remember how to do it. There are some instructions you can refer back to. And they found that--

So for them, they were a little bit generous. So cognitive impairment was getting a mini cog score of less than two-- less than or equal to two. So it's two out of five points. And you can see that the folks who had the higher mini cog were more likely to have a higher level of education, had the higher meds. Their ADLs were pretty much even in both groups, and IADLs also. And then limitations due to physical health, maybe the folks who were more impaired had more limitations.

And what did they find? So 211 were enrolled. 94% endorsed, you know, they were favorable to getting their memory tested. 50 of the participants, in other words 24%, had a mini cog of less than or equal to two. They were older, less educated, like all those things we discussed. There was no difference in pain, pain medication use in these folks. So it wasn't like the people who were cognitively impaired were using more opiates, just so you know. That could have been a confounder.

Primary outcome, looking at discharged not to home, in other words discharged to a rehab setting, found that 88 patients, or 42%, went to rehab setting and they were four times more likely to be cognitively impaired. Secondary outcomes, so looking at hospital length of stay, folks with cognitive impairment stayed an average of 2.6 days longer than the folks without. Post-op delirium, hazard ratio, 4 and 1/2 times higher incident delirium in people with cognitive impairment, which also added to that length of stay.

Post-op complications, they really didn't have enough post-op complications in order to power any kind of conclusion. So they kind of left it at discharged not home, hospital length of stay and post-op delirium.

So fun and useful information in the last remaining minute that I have. This was kind of cute. How many people need a hearing aid but won't get one because they don't work right and they cost thousands and thousands of thousands of dollars? You'll be happy to know that these pocket amplifiers can work just about as well and they cost, on average, quite a bit less. That's the punch line there.

You can read in your syllabi a little more detail and where do you find that paper, and which brand is the best brand for a Pocket Talker. That was a study actually done at Hopkins. Blood pressure. OK, that's my blood pressure. That's not what the guidelines say it should be for-- that's where the cutoff is. I'm just telling you that's where I am, probably, right at this minute.

So in case we all thought that Sprint Senior-- and by the way, here's a plug for you guys for tomorrow, one of the authors on Sprint Senior will be here speaking tonight and tomorrow. Tomorrow he's going to be talking about the Sprint study, I'm imagining. Anyway, so that didn't finish the debate for us. In fact, there were a couple of studies, additional studies, that came out in 2017 adding to the debate on blood pressure.

And then in November, thank god there was some kind of data sanity that came about because a whole bunch of different folks decided to get together and say, let's all kind of collaborate and come up with a best set of recommendations. In other words, I'm going to ask you to postulate, think about, if you haven't jumped ahead in the syllabus yet, think about what are the American Geriatric Society and the American Family Practice Society, and all the other professional organizations, what did they get together to agree on as being the target blood pressure recommended for older adults in the 2017 Joint Professional Society's guideline?

And you guys are already thinking about that. Getting your answers in. Five, four, three, two, one, closing the poll. And what say you, audience? And so in fact, the correct answer is a systolic blood pressure of less than 130 for outpatient older adults, adults over the age of 65, which may be a little more stringent than many of you were thinking because it looks like a lot of you were still thinking about the HYVET study of trying to get the target of less than 150 over 90.

So let's move on to next-- this is really short. I know that the big hook is going to come and sweep me off the stage in just a second. But here's what the front matter for that particular paper or report or guideline looked like. So it's too many organizations weighing in for me to mention. I just wanted to pause and take a moment. So for those of you who are still stuck on [INAUDIBLE], I totally get it.

How many confusing guidelines have we gotten over the years? And when it comes right down to-- and again, you guys can have an opportunity to peruse it. We've gone from 130 over 90, to 140 over 90, to 150 over 90, 140 over 90, 150 over 90. Different ages. We have basically come full circle again, because what the latest set of collaborative expert panel guidelines say is the goal is a target systolic treatment goal of less than 130 millimeters of mercury for a non-institutionalized, in other words, our outpatient population, over the age of 65.

But-- and here's where you have the wiggle room to establish your comfort zone with individualized treatment for the person in front of you-- for older adults with hypertension and a high burden of co-morbidity, limited life expectancy clinical judgment, your clinical judgment, about how they're going to do with tight control, their preference and a team-based approach to assess risk benefit is reasonable for decisions regarding intensity of blood pressure lowering and choice of anti-hypertensive drugs.

So they don't weigh in on which drugs to use. But they do say the target for relatively healthy older people should be about less than a systolic of 130. Final caveats, exclude people who have a standing blood pressure of less than 110. Monitor for orthostasis anyone that you put on an anti-hypertensive. So with that, we are done. All right, thank you for your attention.

[APPLAUSE]