

- S1 00:18 We're going to start with a great presenter from Michigan State University, Jim Pivarnik. He's going to talk to us about a research area that's incredibly difficult to do but really important. Please welcome Dr. Pivarnik.
- [Applause]
- S2 00:35 Howdy? As Tim said I'm from Michigan State University and if you know anything about us, our mascot is a Spartan, so last time when he was in the lab, I taught him about Aggies and I think you can see he's giggling in there. That's best as I can do, he's still wearing green. I'm going to take you on a whirlwind tour of the 25, 26 years that I've spent in this area and hopefully we come up with something at the end, some decisions.
- S1 01:04 A 100 years ago, a gentleman named Slemmons wrote a book about a handbook for prospective mothers, part of it was exercise. He said, 'The amount of exercise cannot be stated precisely, walking is the best kind, and all kinds of violent exertion should be avoided. Tim, if we're running behind I can end now, that's it [chuckles]. We haven't changed much in 100 years. However, Slemmons also said that, 'The use of a sewing machine should be emphatically forbidden.' So, remember that when you're prescribing physical activity for pregnant women. Obviously the issue is, are we doing any harm? And this was the concern years ago to the maternal field unit.
- S2 01:42 Early studies you can imagine, mostly on animal models - we still do animal work today - but the early studies were done on animals. For humans, it was just basic cardiorespiratory, thermoregulatory type responses, more noninvasive type things. Very limited fetal responses, fetal heart rate, occasionally he gets some other feel movement types of activity.
- S2 02:02 Birth comes obviously, birth weight is the conglomerate of what's going on during the gestational period and gestational lengthen. Another adverse events that happened, these are the things that would have been measured historically.
- S2 02:15 Now the first exercise guidelines that really held a lot of credibility in this country were from the American College of Obstetricians and Gynecologists in 1985. And they're conservative based on the limited data we had at that time. They were at the lower end-- earlier we talked about ACSM recommendations, they were at the lower end of the ACSM recommendations that were in vogue at that period of time. The infamous heart rate should not get over 140 beats a minute which is a band of my existence came out with this particular sort of, guidelines.
- S2 02:47 There were some absolute contraindications if a woman was doing-- had multiple gestation, or multiple birth here. If she had a diagnose of multiple gestation, she shouldn't exercise. I've given a talk before, and occasionally there was a woman in the back of the room that goes [surprised], because she did that when she was pregnant. I've never seen any information. There's a fear of premature labor but it hasn't been documented. There are also some relative contraindications, including history of extremely sedentary lifestyle. If I gave this talk 25 years ago, I'd probably would not have encouraged women who have not been active previously to become active. That's certainly different now.
- S2 03:27 But even then, even in 1985, this little disclaimer on the front of the four-page article by the ACOG said, 'A physically fit pregnant patient may tolerate a more strenuous programs.' So even back then, we were realizing that one size does not fit all.
- S2 03:42 Now, from '85 to '94, a lot of studies has been done as a sort of the golden age of some of the laboratory studies. That's me in the upper right hand corner with

one of my first research subjects when I was in Houston. I was in Houston for ten years, so I'm a naturalized Texan. And she's probably about 25 years old now.

S2 04:00

So we found out a lot of information there and pretty much all of it was good, That we are not doing any harm. The guidelines changed in 1994, so that at least three days a week we are preferable so they're a little more upbeat, we got rid of the word heart rate. If you search for heart rate in the guidelines, you wouldn't find it. But go by maternal symptoms. So that was very exciting for those of us in the field. The most recent launch for ACOG anywhere were 2002, which again if you remember the previous talks. They pretty much went along with what the CDC and the American College of Sports Medicine were saying, and that is about 30 minutes moderate activity most of the days of the week, most of the days in CDC jargon met five days of the week.

S2 04:48

Very most recently, I had touched on the physical activity guidelines for Americans, and there was a pregnancy part of that. And lo and behold there shouldn't be surprising to you that, for the untrained woman who is reasonably sedentary, the 150 minutes a week of walking is fine. However, we did talk about the more athletic woman and that if she was very athletic beforehand and she was doing fine, she could continue a lot of this activity.

S2 05:18

A number of benefits that we've found for physical activity during pregnancy. Here are just some of them right here and this is real exciting. It took a while for these studies. You see, a lot of these studies are fairly recently, certainly within the last decade. Before that, in the 80s and 90s, we just didn't have this evidence so we couldn't be quite as aggressive with our recommendations. But these are just a few of the biggies. About a half - just a little bit more if you look at the behavioral risk factors survey - It's the survey that the CDC-- It's the telephone survey that we have to every state. About half of the women who were pregnant said, 'I'm doing at least something.' But the something was only a little bit and only about 19 to 20 % of women did the 150 minutes, so we've got a lot of work to do, so it's like anything else, now we know it's good, how do we get women to do it? Well, which activity is the best? There's a lot of them, is it Yoga? Is it Pilates? And when women ask me that, who are pregnant, I give them the same answer I give to somebody that wasn't pregnant, do the one that you like, and the one that you're going to do. With the few caveats that I'll get into, but it really doesn't matter too much.

S2 06:26

Weight training, this is a sort of a no-no for a while, And one of the reasons is we didn't have any research on it. I tell students, you want to do pregnancy research that hasn't been done very much? Do resistance training. Every big city has got a big health club with a five foot nothing woman that's have three kids, and she weighs about a 102 and she's doing a resistance training exercise program. If we could evaluate all of those program and look at outcomes, that would be a great study. Remember if you do that, give me a credit for it [laughter]. But we don't have a lot of information on it, there's very few-- there's no evidence that it's harmful, and no surprise to you they're in the resistance training business. This is pretty much the recommendations that are given. Obviously the fear earlier was the valsalva of holding your breath, impeding blood flow to the uterus. The woman possibly passing out or some harm to the fetus. But there is just not evidence with this.

S2 07:21

I have a student who published a paper recently, that's in the Journal of Physical Activity and Health that's coming out in papers soon.

We looked at women who went to 24-Hour fitness kinds of places. She said the average woman just on her own was doing this, which shouldn't be a huge surprise to you. It was exciting we found a decreased prevalence of hypertension and also diabetes that came upon the woman during pregnancy.

That's really exciting. We didn't see any increase in adverse outcomes. That's good stuff for women who do want to resist some strain.

S2 07:54

But how much is okay? We were talking earlier, what are the limits and what is the right amount of exercise during pregnancy? looks like this woman was doing pretty well to keep up with her weight training even when she was pregnant. Well little evidence, I know you can't see this very well, this was in the chronicle of higher education about seven years ago. Where a woman on a basketball team - NCWA basketball team - she hit her pregnancy for eight months, and I follow our women's team quite a bit, and I know that the trainers and the coaches. And I said, how could they hide that from me? The other trainer said, It's difficult but possible, and obviously it finally got to this woman's performance and she sort of broke down. But her doctor said, all things considered, she did fine. Now, is that a recommendation to play NCWA division on basketball? Probably not, but it's a pretty good situation with a lot of protection for the fetus. This was an interesting one, I got some questions about this in the 2012 olympics, a woman from Malaysia. And the biggest issue with her, she's pretty furlong was actually the plane flight, because you're not supposed to be flying after the second trimester, and she was beyond that, but her physician said fine. And when I interviewed her, she said the main problem was obviously - well if your Texas, you know how to shoot a gun - you have to do it in between heart rates, it's not only her heart rate but the fetal heart rate, and the elbows that she was getting every once in a while. So she talked to the baby and comment down between the shots, that was kind of cool.

S2 09:29

You probably heard of Amber Miller, if you haven't, this woman had permission from her physician to run-walk the first half of the Chicago marathon, well Amber who had run throughout her pregnancy, her first pregnancy, was feeling great at 13 miles. So she kind of walked and jogged along the way and finished the thing. Then, she went out and got something to eat, and then she started feeling contractions, went to the hospital and deliver. So that's a pretty full day for Amber [laughter].

S2 09:59

The point is her physician probably knew she gong to do this, and it was one of those-- and the medical team for the Chicago marathon, kind of had her on alert, so they knew what was going on. Now, this is the most recent one I've got some information on the cross fitting moment and when this first came out it was a lot of hullabaloo, and people had opinions on all sides. And the thing that I didn't see in the first study, the most important thing I've ever look at what are their position say? And later on she says, the position said fine. And also, even though this middle picture looks impressive to me, what was this compare to what used to do? And she said, she backed off about 50%. Well, she reduced it. Maybe for Leann that's fine, now again, this is not a recommendation for everybody but there are some out there, they can do that. But the important thing, is this, you have to have the relationship with the health care provider, all the way, psychological, physical, everything else. And you've got to build this trust. And that's what I would tell to any woman who's a high level athlete. Obviously the blunt trauma you don't want to do. You worried about balance, and obviously hydration, reverted talk about it earlier and heat. There are warning signs that are hopefully every woman learns about when she's at her physicians office and ignore them. So how much is okay? You really can't generalize. Everyone must be individualized and don't ignore this symptoms.

S2 11:32

Just to switch off just a little bit, talking about gestational weight gain, the institute of medicine has told of women how much they should gain based on their pre-pregnancy weight. I'm just summarize the studies that have been done and I've looked at this, and it's not a huge difference. But it's a little bit in terms of the weight gain and typically it happens if they also take care of their diet. So the two go hand in hand which shouldn't be a surprise to most to of you out

there. Now what are some barriers? Well, this woman was kind of complaining the road construction crew because they were jack hammering and she thought that was going to hurt her baby. You can see her standing there with the cigarette in her mouth. I don't know if that's a barrier. There's a lot of barriers. There's a normal ones that we have just to get everybody off the couch, and when you overlay pregnancy it gets difficult, because I have a relative who said, no, you shouldn't do that, or cultural differences. So it's very very difficult. And this is an exciting area that were starting to look at now to find out what we can to get over with that barrier, and you have to work with the family, with the support system and certainly with the medical staff.

S2 12:39                   What about after pregnancy? When can a woman resume? Well there's a good answer, it depends. How much does she do during pregnancy? How difficult was the delivery? And this is what ACOG says, I know a lawyer wrote this, this is the biggest statement that sounds impressive that really doesn't say anything, which is fine, if I had their malpractice insurance, I would say the same thing. You know it's interesting, the studies that I've look at barriers with very very active women, and looked at barriers with women who were more sedentary, the barriers are pretty much the same. It's just that the active women figured out a way to get around it. And sometimes, it's an SES education factor, and sometimes it's just the fact that their athletes and they've always had to overcome barriers.

S2 13:21                   You probably heard about Dara Torres, she did very well after the olympics. Paula Radcliffe. I was interviewed by the New York Times about Paula Radcliffe, and I made a statement like, 'Very impressive that she could do this, not many women could do it.' And New York Times said, Dr. Pivarnik says, 'No woman has ever done that.' And I thought u-oh. The next morning I was at ACSM headquarters at 7 a.m. in the morning, the paper just come out. I got an email, it says great. I'm a marathoner myself who's run through four pregnancies, resumed running two days after giving birth, also run the L.A. marathon, four weeks post-partum from my fastest time ever. And what do you know? You know what I did? I emailed her back and we had some great conversations. So that's not what I said. It's rare, there aren't too many women like this. But it is possible for the high level ones.

S2 14:09                   And just one last thing. What can we do now about the women, and to keep them active during pregnancy and afterwards? Well, one of my students has a paper coming out in American Journal of Lifestyle Medicine. And we did find the self efficacy for activity, how well the woman thinks that she can be active and successful, it's really related to how long she'll stay physically active during pregnancy, and also pick it up again post-partum. And the exciting thing with these women is it was inversely related to weight retention, which is fantastic. So I think as health care providers, and those who are going to work with these women, if we can get this education to them, then I think we'll go a long way. So I want to do a shout out to my Michigan State friends, and thank you [applause].

S1 14:58                   Good job.

S2 14:59                   Thanks.

S1 15:00                   Good job Jim.

S1 15:01                   Thanks.

S2 15:02                   So we got some questions for you here, if I can get my screen to turn up here. Melissa B., 'Howdy, has exercise during pregnancy help reduce the rates of gestational diabetes?'

S2 15:12                   Yes.

S1 15:14 Okay [laughter].

S2 15:15 And the thing about that is like a lot of diabetes, diabetes is very responsive to physical activity. You don't have to be doing lots of interval training and cross fitting stuff to do. It's the same thing with pregnancy. So even a walking program will help, yes.

S1 15:31 From Cal L., 'Is there any type of movement or exercise like sit ups that pregnant women should avoid?'

S2 15:37 It depends on the woman. I wouldn't say start the world's sit up championship contest because there's a fear of rectus diastasis where the muscles are sort of separating. If you have that problem obviously stop. One of the things that I usually tell women is do the-- rather than the inverted sit ups, go the other way so you're sitting down so to speak, and that seems to work.

S1 16:00 Sandy K., from TAMU Class of '94, 'Are there new recommendations for very active women carrying multiples?'

S2 16:09 Very active women carrying multiples. That would be a very thin slice of the world's population. The problem is with guidelines, is you can't write guidelines for every little group. If the question is, multiples. I would say, go to your health care provider, they're the best source. Regardless of the activity.

S1 16:26 All your positions, instructions.

S2 16:28 Yes, for sure.

S1 16:29 And the last one's from Sophie G. at UNC Charlotte, 'Does exercise during pregnancy alter the nutrient needs of the mother?'

S2 16:37 It does a little bit, but again it depends on how much she's doing. So she exercises a lot, yes, but it's really no different-- she wants to have a steady weight gain, assuming her position, one or two. So take this into account, work with the dietitian or work with the prenatal clinic, and you should be fine.

S1 16:55 Super! Jim, Thank you so much.

S2 16:57 Thank you [applause].

S1 16:58 Great to have you [applause].