00:00:00.000 --> 00:00:02.340 Support for Yale Cancer Answers
00:00:02.340 --> 00:00:04.212 comes from AstraZeneca,
00:00:04.220 --> 00:00:06.036 proud partner in personalized
00:00:06.036 --> 00:00:07.398 medicine developing tailored
00:00:07.398 --> 00:00:09.330 treatments for cancer patients.
00:00:09.330 --> 00:00:13.710 Learn more at AstraZeneca-usa.com.
00:00:13.710 --> 00:00:15.142 Welcome to Yale Cancer
00:00:15.142 --> 00:00:16.574 Answers with your host
00:00:16.580 --> 00:00:18.380 Doctor Anees Chagpar.
00:00:18.380 --> 00:00:19.888 Yale Cancer Answers features
00:00:19.888 --> 00:00:21.773 the latest information on cancer
00:00:21.773 --> 00:00:23.703 care by welcoming oncologists and
00:00:23.703 --> 00:00:25.935 specialists who are on the forefront
00:00:25.993 --> 00:00:27.709 of the battle to fight cancer.
00:00:27.710 --> 00:00:29.744 This week is a conversation about
00:00:29.744 --> 00:00:32.289 the role of obesity and insulin in
00:00:32.289 --> 00:00:34.164 cancer with doctor Rachel Perry.
00:00:34.170 --> 00:00:36.138 Doctor Perry is an assistant professor
00:00:36.138 --> 00:00:38.120 in Medicine and Endocrinology
NOTE Confidence: 0.920009016990662
00:00:38.120 --> 00:00:39.800 and cellular and Molecular Physiology
00:00:39.800 --> 00:00:42.070 at the Yale School of Medicine,
00:00:42.070 --> 00:00:44.998 where doctor Chagpar is a
00:00:44.998 --> 00:00:46.950 professor of surgical oncology.
00:00:46.950 --> 00:00:47.320 Rachel,
00:00:47.320 --> 00:00:49.366 maybe we can start by talking
NOTE Confidence: 0.948627531528473
00:00:49.366 --> 00:00:51.370 a little bit about obesity.
00:00:55.050 --> 00:00:57.060 They talk about it
NOTE Confidence: 0.948627531528473
00:00:57.060 --> 00:00:59.090 being like the other pandemic.

NOTE Confidence: 0.948627531528473

00:00:59.090 --> 00:01:00.562 It's really something that's

NOTE Confidence: 0.948627531528473

00:01:00.562 --> 00:01:02.402 prevalent across the world,

NOTE Confidence: 0.948627531528473

00:01:02.410 --> 00:01:04.718 is that right?

NOTE Confidence: 0.941676080226898

00:01:04.720 --> 00:01:05.995 Yes, that is absolutely true.

NOTE Confidence: 0.941676080226898

00:01:05.995 --> 00:01:09.666 So at this point we're coming up on close

NOTE Confidence: 0.941676080226898

00:01:09.666 --> 00:01:12.764 to 50% of Americans who are obese and

NOTE Confidence: 0.941676080226898

00:01:12.764 --> 00:01:15.040 large numbers really worldwide as well.

NOTE Confidence: 0.941676080226898

00:01:15.040 --> 00:01:17.623 And with that obesity is a problem

NOTE Confidence: 0.941676080226898

00:01:17.623 --> 00:01:20.598 in and of itself, it increases

NOTE Confidence: 0.941676080226898

00:01:20.598 --> 00:01:22.578 the risk of cardiovascular disease,

NOTE Confidence: 0.941676080226898

00:01:22.580 --> 00:01:24.168 stroke and cancer which we will discuss

NOTE Confidence: 0.941676080226898

00:01:24.168 --> 00:01:25.756 today and other conditions,

NOTE Confidence: 0.941676080226898

00:01:25.760 --> 00:01:28.406 but it also brings with it an

NOTE Confidence: 0.941676080226898

00:01:28.406 --> 00:01:30.920 increased risk of type 2 diabetes

00:01:36.400 --> 00:01:38.548 which can be caused by obesity and

NOTE Confidence: 0.941676080226898

00:01:38.548 --> 00:01:40.698 is expected to effect 100% of

NOTE Confidence: 0.941676080226898

00:01:40.698 --> 00:01:42.488 Americans, or would affect 100%

NOTE Confidence: 0.941676080226898

00:01:42.490 --> 00:01:44.280 of Americans if current trends

NOTE Confidence: 0.941676080226898

00:01:44.280 --> 00:01:46.070 continue by the year 2050.

NOTE Confidence: 0.941676080226898

00:01:46.070 --> 00:01:48.580 That really is mazing.

NOTE Confidence: 0.941676080226898

00:01:48.580 --> 00:01:51.076 So that tells us we need to do

NOTE Confidence: 0.941676080226898

00:01:51.076 --> 00:01:52.869 something to intervene here.

NOTE Confidence: 0.936806857585907

00:01:52.870 --> 00:01:54.430 Two statistics that

NOTE Confidence: 0.936806857585907

00:01:54.430 --> 00:01:56.876 you put out in a single sentence

NOTE Confidence: 0.936806857585907

00:01:56.876 --> 00:01:59.318 that just completely blew me away.

NOTE Confidence: 0.936806857585907

00:01:59.320 --> 00:02:02.392 The first is that almost half of all

NOTE Confidence: 0.936806857585907

00:02:02.392 --> 00:02:05.045 Americans are obese and all of us are

NOTE Confidence: 0.936806857585907

00:02:05.045 --> 00:02:07.940 going to end up with Type 2 diabetes

NOTE Confidence: 0.936806857585907

00:02:07.940 --> 00:02:09.592 in 30 short years,

NOTE Confidence: 0.936806857585907

00:02:09.592 --> 00:02:11.240 that's incredible.

NOTE Confidence: 0.942913174629211

00:02:11.240 --> 00:02:13.718 I just have to correct myself.

NOTE Confidence: 0.942913174629211

00:02:13.720 --> 00:02:15.790 Overweight or obese, almost 50%.

NOTE Confidence: 0.942913174629211

00:02:15.790 --> 00:02:19.086 I was gonna ask about that.

NOTE Confidence: 0.942913174629211

00:02:19.090 --> 00:02:22.394 So what really is the definition of obesity?

NOTE Confidence: 0.942913174629211

00:02:22.400 --> 00:02:25.165 I mean are we talking about

NOTE Confidence: 0.942913174629211

00:02:25.165 --> 00:02:28.128 that last five or 10

NOTE Confidence: 0.942913174629211

00:02:28.128 --> 00:02:30.654 pounds that everyone has to lose?

NOTE Confidence: 0.942913174629211

00:02:30.660 --> 00:02:32.946 Or are we talking about people

NOTE Confidence: 0.942913174629211

00:02:32.946 --> 00:02:34.991 who are seriously several pounds

NOTE Confidence: 0.942913174629211

00:02:34.991 --> 00:02:37.256 or several 100 pounds overweight?

NOTE Confidence: 0.942913174629211

00:02:37.260 --> 00:02:40.165 Somewhere in between the two.

NOTE Confidence: 0.942913174629211

00:02:40.170 --> 00:02:41.562 Technically, obesity is defined

NOTE Confidence: 0.942913174629211

00:02:41.562 --> 00:02:43.900 as a body mass index over 30,

NOTE Confidence: 0.942913174629211

00:02:43.900 --> 00:02:45.510 and that really corresponds to

NOTE Confidence: 0.942913174629211

00:02:45.510 --> 00:02:47.630 being about 30 to 50 pounds,

NOTE Confidence: 0.942913174629211

00:02:47.630 --> 00:02:49.320 closer to 50 pounds over

NOTE Confidence: 0.942913174629211

00:02:49.320 --> 00:02:50.672 our ideal body weight,

NOTE Confidence: 0.942913174629211

00:02:50.680 --> 00:02:52.708 and so we're not talking about,

NOTE Confidence: 0.942913174629211

00:02:52.710 --> 00:02:54.606 you know the last five or

NOTE Confidence: 0.942913174629211

00:02:54.606 --> 00:02:56.440 10 pounds from high school.

NOTE Confidence: 0.942913174629211

00:02:56.440 --> 00:02:59.144 That may put us into the overweight category,

NOTE Confidence: 0.942913174629211

00:02:59.150 --> 00:03:02.264 but we don't need to be hundreds of pounds

NOTE Confidence: 0.942913174629211

00:03:02.264 --> 00:03:04.579 overweight to be in that obese category.

NOTE Confidence: 0.942913174629211

00:03:04.580 --> 00:03:06.326 That can really increase our risk

NOTE Confidence: 0.942913174629211

00:03:06.326 --> 00:03:08.649 of a number of health conditions,

NOTE Confidence: 0.934914469718933

00:03:08.650 --> 00:03:11.594 and so one of those conditions is cancer.

NOTE Confidence: 0.934914469718933

00:03:11.600 --> 00:03:14.849 Can you give us a metric?

NOTE Confidence: 0.934914469718933

00:03:14.850 --> 00:03:16.655 How much does obesity really

NOTE Confidence: 0.934914469718933

00:03:16.655 --> 00:03:19.184 increase your risk? I know a

NOTE Confidence: 0.934914469718933

00:03:19.184 --> 00:03:21.350 lot of people worry about cancer,

NOTE Confidence: 0.934914469718933

00:03:21.350 --> 00:03:23.155 I mean certainly they worry

NOTE Confidence: 0.934914469718933

00:03:23.155 --> 00:03:24.960 about diabetes and heart disease,

NOTE Confidence: 0.934914469718933

00:03:24.960 --> 00:03:27.624 all of those are some of the

NOTE Confidence: 0.934914469718933

00:03:27.624 --> 00:03:30.368 key killers of Americans these days.

NOTE Confidence: 0.934914469718933

00:03:30.370 --> 00:03:32.175 But how much does obesity

NOTE Confidence: 0.934914469718933

00:03:32.175 --> 00:03:33.258 really impact cancer?

NOTE Confidence: 0.934914469718933

00:03:33.260 --> 00:03:35.773 And does it affect all kinds of

NOTE Confidence: 0.934914469718933

00:03:35.773 --> 00:03:37.948 cancer or just a select few?

NOTE Confidence: 0.934914469718933

00:03:37.950 --> 00:03:39.039 Well, those are

NOTE Confidence: 0.939713895320892

00:03:39.040 --> 00:03:41.044 both great questions and in the

NOTE Confidence: 0.939713895320892

00:03:41.044 --> 00:03:43.040 answer to the first question,

NOTE Confidence: 0.939713895320892

00:03:43.040 --> 00:03:45.476 how much does obesity affect cancer risk,

NOTE Confidence: 0.939713895320892

00:03:45.480 --> 00:03:47.700 it's difficult to answer because it

NOTE Confidence: 0.939713895320892

00:03:47.700 --> 00:03:49.912 really depends on the tumor type

NOTE Confidence: 0.939713895320892

00:03:49.912 --> 00:03:52.222 and so I'm going to answer your

NOTE Confidence: 0.939713895320892

00:03:52.222 --> 00:03:54.600 second question first and that is

00:03:56.976 --> 00:03:59.451 at this point there are 13 tumor types

NOTE Confidence: 0.939713895320892

00:03:59.451 --> 00:04:02.335 that the Centers for Disease Control have

NOTE Confidence: 0.939713895320892

00:04:02.335 --> 00:04:04.616 associated with obesity and that means,

NOTE Confidence: 0.939713895320892

00:04:04.620 --> 00:04:06.738 with obesity increasing the risk and

NOTE Confidence: 0.939713895320892

00:04:06.738 --> 00:04:09.215 causing a worse prognosis of those tumor

NOTE Confidence: 0.939713895320892

00:04:09.215 --> 00:04:11.225 types and those include breast cancer,

NOTE Confidence: 0.939713895320892

00:04:11.230 --> 00:04:12.274 ovarian, uterine, renal,

NOTE Confidence: 0.939713895320892

00:04:12.274 --> 00:04:13.408 pancreatic, thyroid, colorectal,

NOTE Confidence: 0.939713895320892

00:04:13.408 --> 00:04:15.598 as well as several others.

NOTE Confidence: 0.939713895320892

00:04:15.600 --> 00:04:18.113 And but there are few tumor types

NOTE Confidence: 0.939713895320892

00:04:18.113 --> 00:04:20.410 where there's no risk of obesity,

NOTE Confidence: 0.939713895320892

00:04:20.410 --> 00:04:23.105 and we really don't understand what causes

NOTE Confidence: 0.939713895320892

00:04:23.105 --> 00:04:25.958 some tumor types to be worse with obesity,

NOTE Confidence: 0.939713895320892

00:04:25.960 --> 00:04:28.179 and other tumor types not to be

NOTE Confidence: 0.939713895320892

00:04:28.179 --> 00:04:30.508 worse within the tumor types that

NOTE Confidence: 0.939713895320892

00:04:30.508 --> 00:04:32.244 are associated with obesity,

NOTE Confidence: 0.939713895320892

00:04:32.250 --> 00:04:34.882 there are some where obesity brings with it

NOTE Confidence: 0.939713895320892

00:04:34.882 --> 00:04:37.429 a relatively lower risk in breast cancer.

NOTE Confidence: 0.939713895320892

00:04:37.430 --> 00:04:39.650 I believe the increase is about

NOTE Confidence: 0.939713895320892

00:04:39.650 --> 00:04:42.200 20 to 30% of an increased risk

NOTE Confidence: 0.939713895320892

00:04:42.200 --> 00:04:44.000 with obesity, still very significant

NOTE Confidence: 0.939713895320892

00:04:44.000 --> 00:04:45.609 but smaller than others.

NOTE Confidence: 0.939713895320892

00:04:45.610 --> 00:04:47.102 Whereas with pancreatic cancer,

NOTE Confidence: 0.939713895320892

00:04:47.102 --> 00:04:50.329 risk is a couple fold, ovarian cancer as well,

NOTE Confidence: 0.939713895320892

00:04:50.330 --> 00:04:52.864 a couple fold greater risk with obesity.

NOTE Confidence: 0.939713895320892

00:04:52.870 --> 00:04:54.690 So as I said

NOTE Confidence: 0.939713895320892

00:04:54.690 --> 00:04:57.224 it really depends on the tumor type.

NOTE Confidence: 0.939713895320892

00:04:57.230 --> 00:04:59.701 But because these 13 cancer types that

NOTE Confidence: 0.939713895320892

00:04:59.701 --> 00:05:01.927 are associated with obesity are among

NOTE Confidence: 0.939713895320892

00:05:01.927 --> 00:05:04.489 the most prevalent cancer types out there,

NOTE Confidence: 0.939713895320892

00:05:04.490 --> 00:05:06.300 it really translates to a

NOTE Confidence: 0.939713895320892

00:05:06.300 --> 00:05:07.386 significant excess risk.

NOTE Confidence: 0.939713895320892

00:05:07.390 --> 00:05:08.842 From an epidemiological standpoint

NOTE Confidence: 0.939713895320892

00:05:08.842 --> 00:05:09.568 that comes

NOTE Confidence: 0.931723535060883

00:05:09.570 --> 00:05:10.659 with obesity.

NOTE Confidence: 0.931723535060883

00:05:10.659 --> 00:05:13.562 And we really don't know why.

NOTE Confidence: 0.931723535060883

00:05:13.562 --> 00:05:16.578 Even 20 to 30% increased risk of breast

NOTE Confidence: 0.931723535060883

00:05:16.578 --> 00:05:18.930 cancer seems pretty significant to me.

NOTE Confidence: 0.931723535060883

00:05:18.930 --> 00:05:21.716 But why is that 20 to 30%

NOTE Confidence: 0.931723535060883

00:05:21.720 --> 00:05:23.715 but in ovarian cancer we're

NOTE Confidence: 0.931723535060883

00:05:23.715 --> 00:05:25.710 talking about more like 200%?

NOTE Confidence: 0.931723535060883

00:05:25.710 --> 00:05:28.910 Do we know why that is?

NOTE Confidence: 0.931723535060883

00:05:28.910 --> 00:05:31.458 Why it is that obesity effects more

NOTE Confidence: 0.931723535060883

00:05:31.458 --> 00:05:34.490 cancers in some situations than in others?

NOTE Confidence: 0.931723535060883

00:05:34.490 --> 00:05:35.687 We really don't,

NOTE Confidence: 0.931723535060883

00:05:35.687 --> 00:05:38.480 and that is a tremendous open question

NOTE Confidence: 0.936609923839569

00:05:38.480 --> 00:05:40.880 that we need to figure out.

NOTE Confidence: 0.936609923839569

00:05:40.880 --> 00:05:43.190 Because if we could figure out

NOTE Confidence: 0.936609923839569

00:05:43.190 --> 00:05:44.730 why obesity worsens certain

NOTE Confidence: 0.936609923839569

00:05:44.800 --> 00:05:46.860 cancer risks worse than others,

NOTE Confidence: 0.936609923839569

00:05:46.860 --> 00:05:49.604 then perhaps we would have a better handle

NOTE Confidence: 0.936609923839569

00:05:49.604 --> 00:05:52.460 on why obesity increases cancer risk

NOTE Confidence: 0.936609923839569

00:05:52.460 --> 00:05:54.791 at all, and that would be the

NOTE Confidence: 0.936609923839569

00:05:54.791 --> 00:05:56.984 target that would be where we

NOTE Confidence: 0.936609923839569

00:05:56.984 --> 00:05:58.844 can intervene in this process.

NOTE Confidence: 0.936609923839569

00:05:58.850 --> 00:06:02.400 A lot of labs, mine included as well as

NOTE Confidence: 0.936609923839569

00:06:02.400 --> 00:06:04.380 many others are working on this

NOTE Confidence: 0.936609923839569

00:06:04.380 --> 00:06:07.020 question to try to uncover number one,

NOTE Confidence: 0.936609923839569

00:06:07.020 --> 00:06:09.216 why are certain tumor types affected

NOTE Confidence: 0.936609923839569

00:06:09.216 --> 00:06:11.279 and not others and #2 why are

NOTE Confidence: 0.936609923839569

00:06:11.280 --> 00:06:13.596 certain tumor types affected worse than

NOTE Confidence: 0.936609923839569

00:06:13.596 --> 00:06:15.512 others because there's really going

NOTE Confidence: 0.936609923839569

00:06:15.512 --> 00:06:17.668 to be a major epidemiological role for

NOTE Confidence: 0.917903363704681

00:06:17.670 --> 00:06:19.090 uncovering that information.

00:06:20.510 --> 00:06:23.598 Do we know what exactly or how exactly

NOTE Confidence: 0.917903363704681

00:06:23.598 --> 00:06:25.817 obesity increases your risk of cancer?

00:06:28.640 --> 00:06:30.761 We're still working on that and there

NOTE Confidence: 0.925198137760162

00:06:30.761 --> 00:06:33.320 have been a number of potential mediators

NOTE Confidence: 0.925198137760162

00:06:33.320 --> 00:06:35.696 that people have thrown out there.

NOTE Confidence: 0.925198137760162

00:06:35.700 --> 00:06:37.776 One that my lab studies is

NOTE Confidence: 0.925198137760162

00:06:37.776 --> 00:06:39.590 insulin and related to that,

NOTE Confidence: 0.925198137760162

00:06:39.590 --> 00:06:41.350 insulin-like growth factor one.

NOTE Confidence: 0.925198137760162

00:06:41.350 --> 00:06:43.185 The concentrations of these molecules

NOTE Confidence: 0.925198137760162

00:06:43.185 --> 00:06:45.695 increase with obesity and we and others

NOTE Confidence: 0.925198137760162

00:06:45.695 --> 00:06:47.837 have shown that in vitro those molecules

NOTE Confidence: 0.925198137760162

00:06:47.837 --> 00:06:49.820 can increase tumor cell division.

NOTE Confidence: 0.925198137760162

00:06:49.820 --> 00:06:52.644 We can talk a little bit later about

NOTE Confidence: 0.925198137760162

00:06:52.644 --> 00:06:55.119 the mechanism by which that may occur,

NOTE Confidence: 0.925198137760162

00:06:55.120 --> 00:06:56.071 if you'd like.

NOTE Confidence: 0.925198137760162

00:06:56.071 --> 00:06:58.779 But there have been a number of other

NOTE Confidence: 0.925198137760162

00:06:58.779 --> 00:07:01.677 factors that people have proposed as well,

NOTE Confidence: 0.925198137760162

00:07:01.680 --> 00:07:02.805 including inflammatory cytokines.

NOTE Confidence: 0.925198137760162

00:07:02.805 --> 00:07:04.680 Obesity is a pro inflammatory

NOTE Confidence: 0.925198137760162

00:07:04.680 --> 00:07:06.531 state and so inflammatory cytokines

NOTE Confidence: 0.925198137760162

00:07:06.531 --> 00:07:08.266 are up in obese individuals.

NOTE Confidence: 0.925198137760162

00:07:08.270 --> 00:07:11.006 There's leptin, a protein that is

NOTE Confidence: 0.925198137760162

00:07:11.006 --> 00:07:14.019 secreted by the fat and has been shown in

NOTE Confidence: 0.925198137760162

00:07:14.019 --> 00:07:16.699 certain models to accelerate tumor growth.

NOTE Confidence: 0.925198137760162

00:07:16.700 --> 00:07:19.290 There are other hormones that

NOTE Confidence: 0.925198137760162

00:07:19.290 --> 00:07:20.844 may be involved, we

NOTE Confidence: 0.925198137760162

00:07:20.850 --> 00:07:21.890 mentioned insulin,

NOTE Confidence: 0.925198137760162

00:07:21.890 --> 00:07:23.970 but also potentially Glucagon,

NOTE Confidence: 0.925198137760162

00:07:23.970 --> 00:07:24.752 Adiponectin.

NOTE Confidence: 0.925198137760162

00:07:24.752 --> 00:07:27.880 And any and all of these have

NOTE Confidence: 0.925198137760162

00:07:27.956 --> 00:07:29.380 been shown in vitro,

NOTE Confidence: 0.925198137760162

00:07:29.380 --> 00:07:30.985 so in cell culture studies,

NOTE Confidence: 0.925198137760162

00:07:30.985 --> 00:07:32.269 to accelerate tumor growth,

NOTE Confidence: 0.925198137760162

00:07:32.270 --> 00:07:33.554 and there's been increasing

NOTE Confidence: 0.925198137760162

00:07:33.554 --> 00:07:35.159 work in mice in humans,

NOTE Confidence: 0.925198137760162

00:07:35.160 --> 00:07:37.026 it's a little bit more difficult

NOTE Confidence: 0.925198137760162

00:07:37.026 --> 00:07:39.307 to tell the answer because you know

NOTE Confidence: 0.925198137760162

00:07:39.307 --> 00:07:41.257 a patient comes in with cancer.

NOTE Confidence: 0.925198137760162

00:07:41.260 --> 00:07:43.675 you can't do all these types of

NOTE Confidence: 0.925198137760162

00:07:43.675 --> 00:07:45.264 interventions that we're able to

NOTE Confidence: 0.925198137760162

00:07:45.264 --> 00:07:47.674 do in the lab to really be able to

NOTE Confidence: 0.925198137760162

00:07:47.674 --> 00:07:49.609 pick out certain positive factors,

NOTE Confidence: 0.925198137760162

00:07:49.610 --> 00:07:51.591 but all of these hormones and cytokines

NOTE Confidence: 0.925198137760162

00:07:51.591 --> 00:07:53.839 that I just listed correlate with

NOTE Confidence: 0.925198137760162

00:07:53.839 --> 00:07:55.619 tumor appearance and progression.

00:07:57.770 --> 00:07:58.450 And a point

NOTE Confidence: 0.925198137760162

00:07:58.450 --> 00:08:00.830 I wanted to make related to the

NOTE Confidence: 0.925198137760162

00:08:00.830 --> 00:08:02.080 role of obesity,

NOTE Confidence: 0.925198137760162

00:08:02.080 --> 00:08:04.425 we talked about how obesity may increase

NOTE Confidence: 0.925198137760162

00:08:04.425 --> 00:08:07.110 the risk of certain types of cancers,

NOTE Confidence: 0.925198137760162

00:08:07.110 --> 00:08:09.258 but it also worsens the progression

NOTE Confidence: 0.925198137760162

00:08:09.260 --> 00:08:11.408 and increases the rate of recurrence

NOTE Confidence: 0.925198137760162

00:08:11.408 --> 00:08:12.482 of the cancer.

NOTE Confidence: 0.925198137760162

00:08:12.490 --> 00:08:15.338 So when we say that obesity may increase

NOTE Confidence: 0.925198137760162

00:08:15.338 --> 00:08:17.877 the risk of breast cancer by 20%,

NOTE Confidence: 0.925198137760162

00:08:17.880 --> 00:08:20.238 it also worsens the prognosis of

NOTE Confidence: 0.925198137760162

00:08:20.238 --> 00:08:22.197 someone who's already diagnosed with

NOTE Confidence: 0.925198137760162

00:08:22.197 --> 00:08:24.111 breast cancer as well as increasing

NOTE Confidence: 0.925198137760162

00:08:24.111 --> 00:08:26.489 her risk of recurrence, so that 20%

NOTE Confidence: 0.925198137760162

00:08:26.490 --> 00:08:29.010 increased risk is really not just 20%.

NOTE Confidence: 0.925198137760162

00:08:29.010 --> 00:08:31.110 Because the increased risk continues

NOTE Confidence: 0.925198137760162

00:08:31.110 --> 00:08:34.029 down the line and we really need

NOTE Confidence: 0.925198137760162

00:08:34.029 --> 00:08:36.612 to figure out what the reason for

NOTE Confidence: 0.925198137760162

00:08:36.612 --> 00:08:39.268 that is so that we can intervene in

NOTE Confidence: 0.929303407669067

00:08:39.270 --> 00:08:40.790 a mechanistically driven manner.

NOTE Confidence: 0.929303407669067

00:08:40.790 --> 00:08:43.796 And I think that the

NOTE Confidence: 0.929303407669067

00:08:43.796 --> 00:08:45.764 other problem now that you mention

NOTE Confidence: 0.929303407669067

00:08:45.764 --> 00:08:48.173 it, is the fact that obesity really

NOTE Confidence: 0.929303407669067

00:08:48.173 --> 00:08:50.283 increases the risk of recurrence,

NOTE Confidence: 0.929303407669067

00:08:50.290 --> 00:08:52.185 particularly in breast cancer and

NOTE Confidence: 0.929303407669067

00:08:52.185 --> 00:08:54.470 maybe in other cancers as well.

NOTE Confidence: 0.929303407669067

00:08:54.470 --> 00:08:57.011 Some of the therapies that we use

NOTE Confidence: 0.929303407669067

00:08:57.011 --> 00:08:59.493 actually make you gain weight, so

NOTE Confidence: 0.929303407669067

00:08:59.493 --> 00:09:01.808 many breast cancer survivors actually

NOTE Confidence: 0.929303407669067

00:09:01.808 --> 00:09:04.610 gain weight during therapy and then on

NOTE Confidence: 0.929303407669067

00:09:04.610 --> 00:09:07.196 top of that that weight gain or that

NOTE Confidence: 0.929303407669067

00:09:07.196 --> 00:09:09.998 obesity increases their risk of recurrence.

NOTE Confidence: 0.929303407669067

00:09:10.000 --> 00:09:13.888 So have people looked at that?

NOTE Confidence: 0.929303407669067

00:09:13.890 --> 00:09:16.490 I mean, is the weight that you gain

NOTE Confidence: 0.929303407669067

00:09:16.490 --> 00:09:18.426 during therapy versus simply just

NOTE Confidence: 0.929303407669067

00:09:18.426 --> 00:09:20.456 being overweight to begin with?

NOTE Confidence: 0.929303407669067

00:09:20.460 --> 00:09:22.285 Does that make a difference

NOTE Confidence: 0.929303407669067

00:09:22.285 --> 00:09:23.380 to your recurrence?

NOTE Confidence: 0.929303407669067

00:09:23.380 --> 00:09:25.210 If you were normal weight,

NOTE Confidence: 0.929303407669067

00:09:25.210 --> 00:09:27.576 for example, when you were diagnosed and

NOTE Confidence: 0.929303407669067

00:09:27.576 --> 00:09:30.318 then you gained weight with your treatment,

NOTE Confidence: 0.929303407669067

00:09:30.320 --> 00:09:32.882 does that increase your risk of

NOTE Confidence: 0.929303407669067

00:09:32.882 --> 00:09:35.024 recurrence because that weight gain

NOTE Confidence: 0.929303407669067

00:09:35.024 --> 00:09:37.214 was related to your treatment versus

NOTE Confidence: 0.929303407669067

00:09:37.214 --> 00:09:40.098 if you were overweight to begin with?

00:09:40.420 --> 00:09:41.500 In fact it does.

NOTE Confidence: 0.934129595756531

00:09:41.500 --> 00:09:43.950 So people have looked at this specifically,

NOTE Confidence: 0.934129595756531

00:09:43.950 --> 00:09:45.798 the change of weight during

NOTE Confidence: 0.934129595756531

00:09:45.798 --> 00:09:47.749 the course of treatment and those

NOTE Confidence: 0.934129595756531

00:09:47.749 --> 00:09:49.409 who gain weight during treatment.

NOTE Confidence: 0.934129595756531

00:09:49.410 --> 00:09:50.373 Actually specifically for

NOTE Confidence: 0.934129595756531

00:09:50.373 --> 00:09:51.978 breast cancer as you mentioned,

NOTE Confidence: 0.934129595756531

00:09:51.980 --> 00:09:54.031 are in fact at a higher risk

NOTE Confidence: 0.934129595756531

00:09:54.031 --> 00:09:55.830 of recurrence of their cancer,

NOTE Confidence: 0.934129595756531

00:09:55.830 --> 00:09:57.714 and so that's something that absolutely

NOTE Confidence: 0.934129595756531

00:09:57.714 --> 00:10:00.317 needs to be kept in mind during therapy.

NOTE Confidence: 0.934129595756531

00:10:00.320 --> 00:10:01.211 Now that said,

NOTE Confidence: 0.934129595756531

00:10:01.211 --> 00:10:03.850 it's not as simple as it may appear,

NOTE Confidence: 0.934129595756531

00:10:03.850 --> 00:10:05.435 because those who lose weight

NOTE Confidence: 0.934129595756531

00:10:05.435 --> 00:10:06.703 during treatment

NOTE Confidence: 0.934129595756531

00:10:06.703 --> 00:10:08.347 also have a poorer prognosis.

NOTE Confidence: 0.934129595756531

00:10:08.350 --> 00:10:11.006 This gets into the issue of cancer cachexia.

NOTE Confidence: 0.934129595756531

00:10:11.010 --> 00:10:12.250 So when patients are

NOTE Confidence: 0.934129595756531

00:10:12.250 --> 00:10:13.490 being treated for cancer,

NOTE Confidence: 0.934129595756531

00:10:13.490 --> 00:10:15.350 have cancer and they lose a

NOTE Confidence: 0.934129595756531

00:10:15.350 --> 00:10:16.590 significant amount of weight,

NOTE Confidence: 0.934129595756531

00:10:16.590 --> 00:10:18.865 a very large amount of weight so

NOTE Confidence: 0.934129595756531

00:10:18.865 --> 00:10:21.299 that they lose a lot of fat and

NOTE Confidence: 0.934129595756531

00:10:21.299 --> 00:10:23.100 start to lose muscle as well,

NOTE Confidence: 0.934129595756531

00:10:23.100 --> 00:10:24.650 those patients are also at

NOTE Confidence: 0.934129595756531

00:10:24.650 --> 00:10:26.200 higher risk for poorer outcomes,

NOTE Confidence: 0.934129595756531

00:10:26.200 --> 00:10:28.370 and so we can't simply tell people,

NOTE Confidence: 0.934129595756531

00:10:28.370 --> 00:10:29.920 just go and lose weight,

NOTE Confidence: 0.934129595756531

00:10:29.920 --> 00:10:32.167 and that's really why we need to

NOTE Confidence: 0.934129595756531

00:10:32.167 --> 00:10:33.468 understand mechanistically what this

NOTE Confidence: 0.934129595756531

00:10:33.468 --> 00:10:35.184 link is between obesity and cancer,

NOTE Confidence: 0.934129595756531

00:10:35.190 --> 00:10:37.050 so that instead of telling people,

NOTE Confidence: 0.934129595756531

00:10:37.050 --> 00:10:38.910 oh, just go and lose weight,

NOTE Confidence: 0.934129595756531

00:10:38.910 --> 00:10:40.806 we can give them a mechanistically

NOTE Confidence: 0.934129595756531

00:10:40.806 --> 00:10:41.438 driven intervention

NOTE Confidence: 0.934129595756531

00:10:41.440 --> 00:10:44.176 that may help mitigate that risk of obesity,

NOTE Confidence: 0.934129595756531

00:10:44.180 --> 00:10:45.544 while not predisposing them

NOTE Confidence: 0.934129595756531

00:10:45.544 --> 00:10:46.567 to cancer cachexia.

NOTE Confidence: 0.926625669002533

00:10:47.330 --> 00:10:50.466 So let's unpack that a little bit more.

NOTE Confidence: 0.926625669002533

00:10:50.470 --> 00:10:53.221 What do you mean by a mechanistically

NOTE Confidence: 0.926625669002533

00:10:53.221 --> 00:10:55.578 driven intervention?

NOTE Confidence: 0.926625669002533

00:10:55.580 --> 00:10:57.758 We want to understand what the molecule is or

NOTE Confidence: 0.926625669002533

00:10:57.758 --> 00:11:00.123 molecules are that are responsible for

NOTE Confidence: 0.926625669002533

00:11:00.123 --> 00:11:02.655 this link between obesity and cancer.

NOTE Confidence: 0.926625669002533

00:11:02.660 --> 00:11:04.820 For instance, if the link is

NOTE Confidence: 0.926625669002533

00:11:04.820 --> 00:11:06.980 at least in part insulin,

NOTE Confidence: 0.926625669002533

00:11:06.980 --> 00:11:08.950 one of my favorite hypothesis,

NOTE Confidence: 0.926625669002533

00:11:08.950 --> 00:11:11.934 there are ways that we can lower insulin

NOTE Confidence: 0.926625669002533

00:11:11.934 --> 00:11:15.229 while not forcing a patient to lose weight.

NOTE Confidence: 0.926625669002533

00:11:15.230 --> 00:11:17.618 There are different drugs that work

NOTE Confidence: 0.926625669002533

00:11:17.620 --> 00:11:20.574 in different ways that would all lower

NOTE Confidence: 0.926625669002533

00:11:20.574 --> 00:11:22.520 circulating insulin and that would

NOTE Confidence: 0.926625669002533

00:11:22.520 --> 00:11:24.968 not require the patient to go on a

NOTE Confidence: 0.926625669002533

00:11:25.040 --> 00:11:27.150 restrictive diet or put themselves

NOTE Confidence: 0.926625669002533

00:11:27.150 --> 00:11:29.647 at risk for cancer cachexia syndrome.

NOTE Confidence: 0.926625669002533

00:11:29.647 --> 00:11:31.582 Similarly, if the link were

NOTE Confidence: 0.926625669002533

00:11:31.582 --> 00:11:32.743 certain inflammatory cytokine,

NOTE Confidence: 0.926625669002533

00:11:32.750 --> 00:11:34.430 there are various antibodies that

NOTE Confidence: 0.926625669002533

00:11:34.430 --> 00:11:36.673 are being developed to block certain

NOTE Confidence: 0.926625669002533

00:11:36.673 --> 00:11:38.179 inflammatory cytokine action,

NOTE Confidence: 0.926625669002533

00:11:38.180 --> 00:11:40.256 and so we could potentially give

NOTE Confidence: 0.926625669002533

00:11:40.256 --> 00:11:42.572 folks an antibody to that particular

NOTE Confidence: 0.926625669002533

00:11:42.572 --> 00:11:45.164 cytokine that might lower their risk,

NOTE Confidence: 0.926625669002533

00:11:45.170 --> 00:11:45.944 while again,

NOTE Confidence: 0.926625669002533

00:11:45.944 --> 00:11:48.266 not requiring them to lose weight.

NOTE Confidence: 0.926625669002533

00:11:48.270 --> 00:11:51.825 So it would just allow us to more safely

NOTE Confidence: 0.926625669002533

00:11:51.830 --> 00:11:53.705 intervene in this link between

NOTE Confidence: 0.926625669002533

00:11:53.705 --> 00:11:54.830 obesity and cancer

NOTE Confidence: 0.926625669002533

00:11:54.830 --> 00:11:56.330 if we could understand

NOTE Confidence: 0.926625669002533

00:11:56.330 --> 00:11:57.830 exactly what mediates it.

NOTE Confidence: 0.926101684570313

00:11:57.830 --> 00:12:00.038 Except that they'd still be at

NOTE Confidence: 0.926101684570313

00:12:00.038 --> 00:12:01.955 increased risk of heart disease

NOTE Confidence: 0.926101684570313

00:12:01.955 --> 00:12:03.830 and diabetes if they were

NOTE Confidence: 0.926101684570313

00:12:03.830 --> 00:12:04.958 overweight, right?

NOTE Confidence: 0.926101684570313

00:12:04.958 --> 00:12:06.462 Yes, certainly weight loss

NOTE Confidence: 0.926101684570313

00:12:06.462 --> 00:12:07.960 within a healthy range,

NOTE Confidence: 0.926101684570313

00:12:07.960 --> 00:12:10.210 so not becoming underweight but

NOTE Confidence: 0.926101684570313

00:12:10.210 --> 00:12:12.180 weight loss within a healthy

NOTE Confidence: 0.926101684570313

00:12:12.180 --> 00:12:14.913 range is probably going to be the

NOTE Confidence: 0.926101684570313

00:12:14.913 --> 00:12:16.959 best way to mitigate this risk.

NOTE Confidence: 0.926101684570313

00:12:16.960 --> 00:12:19.210 Overall though it may be very

NOTE Confidence: 0.926101684570313

00:12:19.210 --> 00:12:20.710 difficult during cancer treatment,

NOTE Confidence: 0.926101684570313

00:12:20.710 --> 00:12:21.730 as you mentioned.

NOTE Confidence: 0.926101684570313

00:12:21.730 --> 00:12:23.090 Cancer treatment tends to

NOTE Confidence: 0.926101684570313

00:12:23.090 --> 00:12:24.860 cause people to gain weight,

NOTE Confidence: 0.926101684570313

00:12:24.860 --> 00:12:27.170 and so during that short period of

NOTE Confidence: 0.926101684570313

00:12:27.170 --> 00:12:29.819 time it may be better to focus on

NOTE Confidence: 0.926101684570313

00:12:29.820 --> 00:12:32.137 what we can do from

NOTE Confidence: 0.926101684570313

00:12:32.137 --> 00:12:33.130 a cancer standpoint,

NOTE Confidence: 0.926101684570313

00:12:33.130 --> 00:12:34.785 to mechanistically intervene in this

NOTE Confidence: 0.926101684570313

00:12:34.785 --> 00:12:36.440 link between obesity and cancer,

NOTE Confidence: 0.926101684570313

00:12:36.440 --> 00:12:38.426 rather than focusing on weight loss.

NOTE Confidence: 0.926101684570313

00:12:38.430 --> 00:12:40.747 But long term from a population standpoint,

NOTE Confidence: 0.926101684570313

00:12:40.750 --> 00:12:42.688 absolutely we should all be encouraging

NOTE Confidence: 0.926101684570313

00:12:42.688 --> 00:12:44.719 our patients and ourselves to

NOTE Confidence: 0.934116303920746

00:12:44.720 --> 00:12:46.706 maintain a healthy weight.

00:12:46.710 --> 00:12:49.662 Rachel, I want to dig a little bit deeper into

NOTE Confidence: 0.934116303920746

00:12:49.662 --> 00:12:52.364 what your lab is doing in terms of

NOTE Confidence: 0.934116303920746

00:12:52.370 --> 00:12:54.638 insulin and its link to obesity.

NOTE Confidence: 0.934116303920746

00:12:54.640 --> 00:12:56.944 One of the statistics that you

NOTE Confidence: 0.934116303920746

00:12:56.944 --> 00:12:59.929 gave us at the top of the show,

NOTE Confidence: 0.934116303920746

00:12:59.930 --> 00:13:01.815 which was the link between

NOTE Confidence: 0.934116303920746

00:13:01.815 --> 00:13:02.946 obesity and diabetes,

NOTE Confidence: 0.934116303920746

00:13:02.950 --> 00:13:05.218 was just mind blowing to me.

NOTE Confidence: 0.934116303920746

00:13:05.220 --> 00:13:07.747 So talk a little bit about that

NOTE Confidence: 0.934116303920746

00:13:07.747 --> 00:13:10.140 and how insulin plays into that,

NOTE Confidence: 0.934116303920746

00:13:10.140 --> 00:13:12.025 as well as into this

NOTE Confidence: 0.934116303920746

00:13:12.025 --> 00:13:13.533 whole concept of obesity.

NOTE Confidence: 0.908530354499817

00:13:14.190 --> 00:13:16.075 Yeah, so my training was

NOTE Confidence: 0.908530354499817

00:13:16.075 --> 00:13:17.583 in straight metabolism.

NOTE Confidence: 0.908530354499817

00:13:17.590 --> 00:13:19.665 I studied diabetes and substrate

NOTE Confidence: 0.908530354499817

00:13:19.665 --> 00:13:21.740 metabolism during my graduate work

NOTE Confidence: 0.908530354499817

00:13:21.804 --> 00:13:23.750 and my post doc and we developed

NOTE Confidence: 0.908530354499817

00:13:23.750 --> 00:13:25.935 methods to be able to assess

NOTE Confidence: 0.908530354499817

00:13:25.935 --> 00:13:28.070 metabolism in different tissues and

NOTE Confidence: 0.908530354499817

00:13:28.070 --> 00:13:30.246 different settings and so one of

NOTE Confidence: 0.908530354499817

00:13:30.246 --> 00:13:32.746 the hormones that we focus on in

NOTE Confidence: 0.908530354499817

00:13:32.746 --> 00:13:34.976 the metabolism world is insulin.

NOTE Confidence: 0.908530354499817

00:13:34.980 --> 00:13:37.368 Insulin is secreted by the endocrine

NOTE Confidence: 0.908530354499817

00:13:37.368 --> 00:13:39.519 pancreas when we eat a meal.

NOTE Confidence: 0.908530354499817

00:13:39.520 --> 00:13:41.776 When blood sugar levels go up,

NOTE Confidence: 0.908530354499817

00:13:41.780 --> 00:13:42.914 insulin is secreted.

NOTE Confidence: 0.908530354499817

00:13:42.914 --> 00:13:45.182 Insulin helps ourselves to take up

NOTE Confidence: 0.908530354499817

00:13:45.190 --> 00:13:47.710 glucose or sugar so that the sugar

NOTE Confidence: 0.908530354499817

00:13:47.710 --> 00:13:50.157 is taken out of the bloodstream

NOTE Confidence: 0.908530354499817

00:13:50.157 --> 00:13:51.865 and into the tissues.

NOTE Confidence: 0.908530354499817

00:13:51.870 --> 00:13:53.840 And when we do that,

NOTE Confidence: 0.908530354499817

00:13:53.840 --> 00:13:55.778 the tissues or even tumors in

NOTE Confidence: 0.908530354499817

00:13:55.778 --> 00:13:58.319 certain cases can use that sugar as

NOTE Confidence: 0.908530354499817

00:13:58.319 --> 00:14:00.284 fuel for themselves while lowering

NOTE Confidence: 0.908530354499817

00:14:00.284 --> 00:14:02.090 blood glucose concentrations.

NOTE Confidence: 0.908530354499817

00:14:02.090 --> 00:14:03.266 So in diabetes,

NOTE Confidence: 0.908530354499817

00:14:03.266 --> 00:14:05.226 that process doesn't happen efficiently.

NOTE Confidence: 0.908530354499817

00:14:05.230 --> 00:14:07.588 People tend to become insulin resistant,

NOTE Confidence: 0.908530354499817

00:14:07.590 --> 00:14:10.418 so their bodies don't respond as well

NOTE Confidence: 0.908530354499817

00:14:10.418 --> 00:14:13.712 as they need to insulin and so it

NOTE Confidence: 0.908530354499817

00:14:13.712 --> 00:14:16.660 either needs to be given by injection,

NOTE Confidence: 0.908530354499817

00:14:16.660 --> 00:14:18.375 or certain interventions need to

NOTE Confidence: 0.908530354499817

00:14:18.375 --> 00:14:20.781 take place to allow the body to

NOTE Confidence: 0.908530354499817

00:14:20.781 --> 00:14:22.341 respond better to insulin and

NOTE Confidence: 0.908530354499817

00:14:22.341 --> 00:14:24.388 the work that we've been doing

NOTE Confidence: 0.908530354499817

00:14:24.390 --> 00:14:26.598 in my lab in the last

NOTE Confidence: 0.908530354499817

00:14:26.598 --> 00:14:28.401 several years has been specifically

NOTE Confidence: 0.908530354499817

00:14:28.401 --> 00:14:30.765 looking at this link between insulin,

NOTE Confidence: 0.908530354499817

00:14:30.770 --> 00:14:31.778 obesity and cancer.

NOTE Confidence: 0.931416273117065

00:14:32.350 --> 00:14:34.338 I think there's a lot more

NOTE Confidence: 0.931416273117065

00:14:34.338 --> 00:14:36.689 we need to learn about obesity,

NOTE Confidence: 0.931416273117065

00:14:36.690 --> 00:14:37.692 insulin, and cancer,

NOTE Confidence: 0.931416273117065

00:14:37.692 --> 00:14:40.030 and how all of that plays together.

NOTE Confidence: 0.931416273117065

00:14:40.030 --> 00:14:42.165 But first we need to take a

NOTE Confidence: 0.931416273117065

00:14:42.165 --> 00:14:44.369 short break for a medical minute.

NOTE Confidence: 0.931416273117065

00:14:44.370 --> 00:14:46.045 Please stay tuned to learn

NOTE Confidence: 0.931416273117065

00:14:46.045 --> 00:14:47.383 more about obesity, insulin,

NOTE Confidence: 0.931416273117065

00:14:47.383 --> 00:14:50.047 and cancer with my guest doctor Rachel Perry.

NOTE Confidence: 0.923841059207916

00:14:50.680 --> 00:14:53.050 Support for Yale Cancer Answers

NOTE Confidence: 0.923841059207916

00:14:53.050 --> 00:14:54.946 comes from AstraZeneca,

NOTE Confidence: 0.923841059207916

00:14:54.950 --> 00:14:57.245 a bio pharmaceutical business that

NOTE Confidence: 0.923841059207916

00:14:57.245 --> 00:15:00.100 is pushing the boundaries of science

NOTE Confidence: 0.923841059207916

00:15:00.100 --> 00:15:02.525 to deliver new cancer medicines.

NOTE Confidence: 0.923841059207916

00:15:02.530 --> 00:15:05.730 More information at astrazeneca-us.com.

NOTE Confidence: 0.923841059207916

00:15:05.730 --> 00:15:08.677 This is a medical minute about genetic

NOTE Confidence: 0.923841059207916

00:15:08.677 --> 00:15:11.239 testing which can be useful for

NOTE Confidence: 0.923841059207916

00:15:11.239 --> 00:15:13.675 people with certain types of cancer

NOTE Confidence: 0.923841059207916

00:15:13.675 --> 00:15:16.418 that seem to run in their families.

NOTE Confidence: 0.923841059207916

00:15:16.420 --> 00:15:18.940 Patients that are considered at risk

NOTE Confidence: 0.923841059207916

00:15:18.940 --> 00:15:21.431 receive genetic counseling and testing so

NOTE Confidence: 0.923841059207916

00:15:21.431 --> 00:15:23.651 informed medical decisions can be based

NOTE Confidence: 0.923841059207916

00:15:23.651 --> 00:15:26.279 on their own personal risk assessment.

NOTE Confidence: 0.923841059207916

00:15:26.280 --> 00:15:28.100 Resources for genetic counseling and

NOTE Confidence: 0.923841059207916

00:15:28.100 --> 00:15:29.920 testing are available at federally

NOTE Confidence: 0.923841059207916

00:15:29.976 --> 00:15:32.028 designated comprehensive cancer centers.

NOTE Confidence: 0.923841059207916

00:15:32.030 --> 00:15:33.674 Interdisciplinary teams include geneticists,

NOTE Confidence: 0.923841059207916

00:15:33.674 --> 00:15:34.960 genetic counselors, physicians,

NOTE Confidence: 0.923841059207916

00:15:34.960 --> 00:15:35.880 and nurses who

NOTE Confidence: 0.923841059207916

00:15:35.880 --> 00:15:38.180 work together to provide

NOTE Confidence: 0.923841059207916

00:15:38.180 --> 00:15:40.360 risk assessment and steps to

NOTE Confidence: 0.923841059207916

00:15:40.360 --> 00:15:42.345 prevent the development of cancer.

NOTE Confidence: 0.923841059207916

00:15:42.350 --> 00:15:44.110 More information is available

NOTE Confidence: 0.923841059207916

00:15:44.110 --> 00:15:44.990 at yalecancercenter.org.

NOTE Confidence: 0.923841059207916

00:15:44.990 --> 00:15:47.630 You're listening to Connecticut public radio.

NOTE Confidence: 0.923899233341217

00:15:48.840 --> 00:15:50.742 This is doctor Anees Chagpar

NOTE Confidence: 0.923899233341217

00:15:50.742 --> 00:15:52.831 and I'm joined tonight by

NOTE Confidence: 0.923899233341217

00:15:52.831 --> 00:15:54.716 my guest doctor Rachel Perry.

NOTE Confidence: 0.923899233341217

00:15:54.720 --> 00:15:56.796 We're talking about the role of

NOTE Confidence: 0.923899233341217

00:15:56.796 --> 00:15:58.986 obesity and insulin in cancer and

NOTE Confidence: 0.923899233341217

00:15:58.986 --> 00:16:01.212 right before the break Rachel, you

NOTE Confidence: 0.923899233341217

00:16:01.212 --> 00:16:03.559 were starting to tell us a little

NOTE Confidence: 0.923899233341217

00:16:03.559 --> 00:16:05.742 bit about how insulin really works in

NOTE Confidence: 0.923899233341217

00:16:05.742 --> 00:16:07.989 terms of causing obesity and how that

NOTE Confidence: 0.923899233341217

00:16:07.989 --> 00:16:10.290 plays into the development of cancer.

NOTE Confidence: 0.923899233341217

00:16:10.290 --> 00:16:12.972 Can you take us back a couple of

NOTE Confidence: 0.923899233341217

00:16:12.972 --> 00:16:15.830 steps and talk about insulin and obesity?

NOTE Confidence: 0.923899233341217

00:16:15.830 --> 00:16:17.738 I know insulin is a hormone

NOTE Confidence: 0.923899233341217

00:16:17.738 --> 00:16:20.029 it's made by the pancreas,

NOTE Confidence: 0.923899233341217

00:16:20.030 --> 00:16:23.648 but how does that cause us to be obese?

NOTE Confidence: 0.923899233341217

00:16:23.650 --> 00:16:26.457 And if all of us make insulin,

NOTE Confidence: 0.923899233341217

00:16:26.460 --> 00:16:27.669 how come not

NOTE Confidence: 0.927075982093811

00:16:27.670 --> 00:16:29.680 all of us are obese?

NOTE Confidence: 0.927075982093811

00:16:29.680 --> 00:16:32.086 Those are both important questions,

NOTE Confidence: 0.927075982093811

00:16:32.090 --> 00:16:34.834 and honestly, we're still not certain the

NOTE Confidence: 0.927075982093811

00:16:34.834 --> 00:16:37.213 metabolic community is still not certain

NOTE Confidence: 0.927075982093811

00:16:37.213 --> 00:16:39.493 to what extent insulin causes obesity

NOTE Confidence: 0.927075982093811

00:16:39.493 --> 00:16:42.139 versus obesity causing high insulin levels.

NOTE Confidence: 0.927075982093811

00:16:42.140 --> 00:16:44.420 We know that obesity causes high

NOTE Confidence: 0.927075982093811

00:16:44.420 --> 00:16:46.437 insulin levels because as individuals

NOTE Confidence: 0.927075982093811

00:16:46.437 --> 00:16:48.567 become more and more obese,

NOTE Confidence: 0.927075982093811

00:16:48.570 --> 00:16:50.650 they become more and more

NOTE Confidence: 0.927075982093811

00:16:50.650 --> 00:16:53.450 insulin resistant and that's due to increased

NOTE Confidence: 0.927075982093811

00:16:53.450 --> 00:16:56.427 levels of lipid or fat in various tissues.

NOTE Confidence: 0.927075982093811

00:16:56.430 --> 00:16:58.350 When we become insulin resistant,

NOTE Confidence: 0.927075982093811

00:16:58.350 --> 00:17:00.280 that means we don't respond,

NOTE Confidence: 0.927075982093811

00:17:00.280 --> 00:17:02.814 our bodies don't respond very well to

NOTE Confidence: 0.927075982093811

00:17:02.814 --> 00:17:05.887 insulin and so our body has to secrete

NOTE Confidence: 0.927075982093811

00:17:05.887 --> 00:17:08.360 more insulin to counteract that effect.

NOTE Confidence: 0.927075982093811

00:17:08.360 --> 00:17:10.436 Now the question of whether insulin

NOTE Confidence: 0.927075982093811

00:17:10.436 --> 00:17:12.600 causes obesity is very interesting

NOTE Confidence: 0.927075982093811

00:17:12.600 --> 00:17:14.910 in sort of a chicken and

NOTE Confidence: 0.927075982093811

00:17:14.910 --> 00:17:16.450 egg type of question,

NOTE Confidence: 0.927075982093811

00:17:16.450 --> 00:17:18.718 and there are a number of

NOTE Confidence: 0.927075982093811

00:17:18.718 --> 00:17:20.700 studies that do suggest that

NOTE Confidence: 0.927075982093811

00:17:20.700 --> 00:17:23.479 insulin may itself independently cause

NOTE Confidence: 0.927075982093811

00:17:23.479 --> 00:17:26.684 obesity and that's at least in large part

NOTE Confidence: 0.927075982093811

00:17:26.684 --> 00:17:28.634 because insulin causes fat deposition.

NOTE Confidence: 0.927075982093811

00:17:28.640 --> 00:17:30.645 It causes those small molecules

NOTE Confidence: 0.927075982093811

00:17:30.645 --> 00:17:33.116 of carbohydrate and fat that are

NOTE Confidence: 0.927075982093811

00:17:33.116 --> 00:17:35.480 floating by in our bloodstream to

NOTE Confidence: 0.927075982093811

00:17:35.480 --> 00:17:37.879 actually be deposited in tissues in

NOTE Confidence: 0.927075982093811

00:17:37.879 --> 00:17:40.165 subcutaneous fat depots and form larger

NOTE Confidence: 0.927075982093811

00:17:40.165 --> 00:17:42.926 and larger pieces of fat, and so

NOTE Confidence: 0.927075982093811

00:17:42.930 --> 00:17:44.121 in that regard,

NOTE Confidence: 0.927075982093811

00:17:44.121 --> 00:17:46.900 it is likely that insulin causes obesity,

NOTE Confidence: 0.927075982093811

00:17:46.900 --> 00:17:48.890 at least to some extent.

NOTE Confidence: 0.927075982093811

00:17:48.890 --> 00:17:51.690 But as I said, it's more certain

NOTE Confidence: 0.927075982093811

00:17:51.690 --> 00:17:53.074 that obesity causes hyperinsulinemia

NOTE Confidence: 0.927075982093811

00:17:53.074 --> 00:17:55.150 or high insulin levels because of

NOTE Confidence: 0.927075982093811

00:17:55.207 --> 00:17:56.939 that insulin resistance phenomenon.

NOTE Confidence: 0.927075982093811

00:17:56.940 --> 00:17:58.065 As you said,

NOTE Confidence: 0.927075982093811

00:17:58.065 --> 00:18:00.315 we all need to have insulin.

NOTE Confidence: 0.927075982093811

00:18:00.320 --> 00:18:02.570 The body knows if it doesn't

NOTE Confidence: 0.927075982093811

00:18:02.570 --> 00:18:04.070 have enough functioning insulin,

NOTE Confidence: 0.927075982093811

00:18:04.070 --> 00:18:06.688 because when we don't have enough insulin,

NOTE Confidence: 0.927075982093811

00:18:06.690 --> 00:18:08.940 our blood glucose levels get high

NOTE Confidence: 0.927075982093811

00:18:08.940 --> 00:18:10.858 without insulin action on various

NOTE Confidence: 0.927075982093811

00:18:10.858 --> 00:18:13.308 tissues, wer'e not able to take up

NOTE Confidence: 0.927075982093811

00:18:13.308 --> 00:18:15.628 enough glucose or sugar from our

NOTE Confidence: 0.927075982093811

00:18:15.628 --> 00:18:17.184 bloodstream into those tissues,

NOTE Confidence: 0.927075982093811

00:18:17.190 --> 00:18:18.654 and when that happens,

NOTE Confidence: 0.927075982093811

00:18:18.654 --> 00:18:21.749 the body senses the high blood sugar level

NOTE Confidence: 0.927075982093811

00:18:21.750 --> 00:18:24.144 and secretes more insulin to try to

NOTE Confidence: 0.927075982093811

00:18:24.144 --> 00:18:26.560 counteract the effects of insulin resistance.

NOTE Confidence: 0.923307538032532

00:18:27.320 --> 00:18:30.312 So let me get this straight, obesity

NOTE Confidence: 0.923307538032532

00:18:30.312 --> 00:18:32.980 causes you to be insulin resistant,

NOTE Confidence: 0.923307538032532

00:18:32.980 --> 00:18:36.204 so your body needs to make more insulin.

NOTE Confidence: 0.923307538032532

00:18:36.210 --> 00:18:39.325 But that insulin takes sugar from your

NOTE Confidence: 0.923307538032532

00:18:39.325 --> 00:18:41.458 bloodstream and deposits it as fat,

NOTE Confidence: 0.923307538032532

00:18:41.460 --> 00:18:44.684 which then causes you to be more obese.

NOTE Confidence: 0.923307538032532

00:18:44.690 --> 00:18:47.120 So isn't this a vicious cycle?

NOTE Confidence: 0.916256725788116

00:18:47.760 --> 00:18:50.343 It absolutely is a vicious cycle and

NOTE Confidence: 0.916256725788116

00:18:50.343 --> 00:18:53.255 we and others have shown that if you

NOTE Confidence: 0.916256725788116

00:18:53.255 --> 00:18:55.880 intervene in any step of this cycle,

NOTE Confidence: 0.916256725788116

00:18:55.880 --> 00:18:58.769 so if you intervene in the step of eating

NOTE Confidence: 0.916256725788116

00:18:58.769 --> 00:19:01.259 too many calories, if you intervene

NOTE Confidence: 0.916256725788116

00:19:01.259 --> 00:19:03.747 in secreting too much insulin,

NOTE Confidence: 0.916256725788116

00:19:03.747 --> 00:19:06.201 if you intervene in depositing that

NOTE Confidence: 0.916256725788116

00:19:06.201 --> 00:19:08.514 sugar in tissues as fat if you

NOTE Confidence: 0.916256725788116

00:19:08.514 --> 00:19:10.639 intervene in any of these steps,

NOTE Confidence: 0.916256725788116

00:19:10.640 --> 00:19:12.716 you can intervene in the cycle

NOTE Confidence: 0.916256725788116

00:19:12.716 --> 00:19:14.700 of the development of obesity.

NOTE Confidence: 0.916256725788116

00:19:14.700 --> 00:19:15.819 But yes, absolutely,

NOTE Confidence: 0.916256725788116

00:19:15.819 --> 00:19:18.057 it's a vicious cycle and this

NOTE Confidence: 0.916256725788116

00:19:18.057 --> 00:19:19.575 absolutely contributes to this

NOTE Confidence: 0.916256725788116

00:19:19.575 --> 00:19:21.735 pandemic of obesity that we have

NOTE Confidence: 0.916256725788116

00:19:21.740 --> 00:19:23.950 in our country and worldwide.

NOTE Confidence: 0.916256725788116

00:19:23.950 --> 00:19:24.700 We're

NOTE Confidence: 0.941334903240204

00:19:24.700 --> 00:19:27.318 going to get back to exactly how

NOTE Confidence: 0.941334903240204

00:19:27.318 --> 00:19:29.936 we can intervene, but let's talk a

NOTE Confidence: 0.941334903240204

00:19:29.936 --> 00:19:32.180 little bit about the cancer part.

NOTE Confidence: 0.941334903240204

00:19:32.180 --> 00:19:34.844 So we talked a little bit at the

NOTE Confidence: 0.941334903240204

00:19:34.844 --> 00:19:37.622 beginning of the show about the fact

NOTE Confidence: 0.941334903240204

00:19:37.622 --> 00:19:39.657 that obesity really does drive,

NOTE Confidence: 0.941334903240204

00:19:39.660 --> 00:19:42.278 I think it was what 13 different

NOTE Confidence: 0.941334903240204

00:19:42.278 --> 00:19:43.400 types of cancer,

NOTE Confidence: 0.941334903240204

00:19:43.400 --> 00:19:46.384 but not all cancers are affected by obesity,

NOTE Confidence: 0.941334903240204

00:19:46.390 --> 00:19:49.374 but certainly a large number of cancers are.

NOTE Confidence: 0.941334903240204

00:19:49.380 --> 00:19:51.250 So how does that happen?

NOTE Confidence: 0.941334903240204

00:19:51.250 --> 00:19:53.120 And what does insulin have

NOTE Confidence: 0.941334903240204

00:19:53.120 --> 00:19:54.990 to do with it anyways?

NOTE Confidence: 0.921279907226563

00:19:55.040 --> 00:19:57.476 Right, so as we were discussing earlier,

NOTE Confidence: 0.921279907226563

00:19:57.480 --> 00:19:59.727 I think in reality there are a

NOTE Confidence: 0.921279907226563

00:19:59.727 --> 00:20:01.410 number of different factors that

NOTE Confidence: 0.921279907226563

00:20:01.410 --> 00:20:03.699 may mediate at least part of this

NOTE Confidence: 0.921279907226563

00:20:03.699 --> 00:20:05.828 link between obesity and cancer.

NOTE Confidence: 0.921279907226563

00:20:05.830 --> 00:20:08.542 But as you said, we focus on specifically

NOTE Confidence: 0.921279907226563

00:20:08.542 --> 00:20:10.698 how insulin may fuel tumor growth.

NOTE Confidence: 0.921279907226563

00:20:10.700 --> 00:20:12.040 So, as I mentioned,

NOTE Confidence: 0.921279907226563

00:20:12.040 --> 00:20:13.715 individuals with obesity frequently have

NOTE Confidence: 0.921279907226563

00:20:13.715 --> 00:20:15.523 high circulating insulin levels because

NOTE Confidence: 0.921279907226563

00:20:15.523 --> 00:20:17.653 they tend to be insulin resistant.

NOTE Confidence: 0.921279907226563

00:20:17.660 --> 00:20:20.380 And this is indeed a vicious cycle. We

NOTE Confidence: 0.921279907226563

00:20:20.380 --> 00:20:23.218 found in a few studies, both in vitro

NOTE Confidence: 0.921279907226563

00:20:23.218 --> 00:20:26.450 so in a dish and in vivo, in mice,

NOTE Confidence: 0.921279907226563

00:20:26.450 --> 00:20:28.385 that insulin can drive tumor

NOTE Confidence: 0.921279907226563

00:20:28.385 --> 00:20:30.320 glucose uptake and metabolism, that

NOTE Confidence: 0.921279907226563

00:20:30.381 --> 00:20:33.021 actually was a little bit surprising

NOTE Confidence: 0.921279907226563

00:20:33.021 --> 00:20:34.781 initially because conventional wisdom

NOTE Confidence: 0.921279907226563

00:20:34.848 --> 00:20:37.473 has said that tumor glucose or sugar

NOTE Confidence: 0.921279907226563

00:20:37.473 --> 00:20:39.302 metabolism is constitutively high,

NOTE Confidence: 0.921279907226563

00:20:39.302 --> 00:20:41.759 so it would always be high and

NOTE Confidence: 0.921279907226563

00:20:41.759 --> 00:20:44.270 not regulated by any hormones,

NOTE Confidence: 0.921279907226563

00:20:44.270 --> 00:20:47.294 but the surprising finding that we

NOTE Confidence: 0.921279907226563

00:20:47.294 --> 00:20:50.749 and that others have also shown is that in fact,

NOTE Confidence: 0.921279907226563

00:20:50.750 --> 00:20:52.370 tumor glucose or sugar

NOTE Confidence: 0.921279907226563

00:20:52.370 --> 00:20:53.990 metabolism is insulin dependent,

NOTE Confidence: 0.921279907226563

00:20:53.990 --> 00:20:56.846 and so in mice that are obese

NOTE Confidence: 0.921279907226563

00:20:56.850 --> 00:20:57.921 and insulin resistant,

NOTE Confidence: 0.921279907226563

00:20:57.921 --> 00:20:59.706 they have high circulating insulin

NOTE Confidence: 0.921279907226563

00:20:59.706 --> 00:21:01.458 levels and this causes glucose

NOTE Confidence: 0.921279907226563

00:21:01.458 --> 00:21:03.098 uptake into their tumor cells.

NOTE Confidence: 0.921279907226563

00:21:03.100 --> 00:21:05.529 After the tumor cells take up glucose,

NOTE Confidence: 0.921279907226563

00:21:05.530 --> 00:21:08.298 it can be used in two different ways.

NOTE Confidence: 0.921279907226563

00:21:08.300 --> 00:21:10.376 It can be used for metabolism,

NOTE Confidence: 0.921279907226563

00:21:10.380 --> 00:21:12.816 so simply to provide the fuel that

NOTE Confidence: 0.921279907226563

00:21:12.816 --> 00:21:14.890 allows the cells to keep going,

NOTE Confidence: 0.921279907226563

00:21:14.890 --> 00:21:17.586 and it can also be used to make

NOTE Confidence: 0.921279907226563

00:21:17.586 --> 00:21:19.059 building blocks for cells.

NOTE Confidence: 0.921279907226563

00:21:19.060 --> 00:21:21.587 So a unique feature about tumor cells

NOTE Confidence: 0.921279907226563

00:21:21.587 --> 00:21:24.258 is that in order to be a tumor,

NOTE Confidence: 0.921279907226563

00:21:24.260 --> 00:21:26.348 these cells need to be growing

NOTE Confidence: 0.921279907226563

00:21:26.348 --> 00:21:28.160 and dividing all the time.

NOTE Confidence: 0.921279907226563

00:21:28.160 --> 00:21:31.112 They grow and divide very rapidly and they

NOTE Confidence: 0.921279907226563

00:21:31.112 --> 00:21:33.836 need building blocks to be able to do that,

NOTE Confidence: 0.921279907226563

00:21:33.840 --> 00:21:35.872 and glucose is a key fuel to be

NOTE Confidence: 0.921279907226563

00:21:35.872 --> 00:21:37.725 able to provide those building

NOTE Confidence: 0.921279907226563

00:21:37.725 --> 00:21:39.845 blocks for these tumor cells,

NOTE Confidence: 0.921279907226563

00:21:39.850 --> 00:21:41.848 and so in that way glucose

NOTE Confidence: 0.921279907226563

00:21:41.850 --> 00:21:43.860 and insulin which drives glucose uptake,

NOTE Confidence: 0.921279907226563

00:21:43.860 --> 00:21:45.530 is a key pathogenic factor in tumors.

NOTE Confidence: 0.941201508045197

00:21:47.250 --> 00:21:49.398 So let me ask you this,

NOTE Confidence: 0.941201508045197

00:21:49.400 --> 00:21:52.172 we know a lot of diabetics who

NOTE Confidence: 0.941201508045197

00:21:52.172 --> 00:21:55.125 are type one diabetics who take insulin.

NOTE Confidence: 0.941201508045197

00:21:55.130 --> 00:21:57.906 Does that mean that the insulin can actually

NOTE Confidence: 0.941201508045197

00:21:57.906 --> 00:22:00.498 be driving tumor growth in these people?

NOTE Confidence: 0.941201508045197

00:22:00.500 --> 00:22:02.582 Putting them at increased risk since

NOTE Confidence: 0.941201508045197

00:22:02.582 --> 00:22:04.430 their injecting themselves with insulin?

NOTE Confidence: 0.924920797348022

00:22:05.410 --> 00:22:07.486 You know that's a key question.

NOTE Confidence: 0.924920797348022

00:22:07.490 --> 00:22:08.874 A very important question,

NOTE Confidence: 0.924920797348022

00:22:08.874 --> 00:22:10.950 and frankly a personally relevant question, as

NOTE Confidence: 0.924920797348022

00:22:10.950 --> 00:22:13.120 I am a person with type one

NOTE Confidence: 0.924920797348022

00:22:13.120 --> 00:22:15.258 diabetes and so this is something

NOTE Confidence: 0.924920797348022

00:22:15.258 --> 00:22:17.520 that I am very curious about.

NOTE Confidence: 0.924920797348022

00:22:17.520 --> 00:22:18.900 The epidemiological evidence doesn't

NOTE Confidence: 0.924920797348022

00:22:18.900 --> 00:22:21.334 seem to support a strong role for

NOTE Confidence: 0.924920797348022

00:22:21.334 --> 00:22:22.874 exogeneous insulin, that is injected

NOTE Confidence: 0.924920797348022

00:22:22.874 --> 00:22:24.557 insulin, in type one diabetic

NOTE Confidence: 0.924920797348022

00:22:24.557 --> 00:22:26.517 individuals in driving tumor growth,

NOTE Confidence: 0.924920797348022

00:22:26.520 --> 00:22:28.596 and there could be a few

NOTE Confidence: 0.924920797348022

00:22:28.596 --> 00:22:29.980 different reasons for that.

NOTE Confidence: 0.924920797348022

00:22:29.980 --> 00:22:32.050 It is a little bit surprising,

NOTE Confidence: 0.924920797348022

00:22:32.050 --> 00:22:33.805 but what we currently believe

NOTE Confidence: 0.924920797348022

00:22:33.805 --> 00:22:36.269 is that you may need two hits.

NOTE Confidence: 0.924920797348022

00:22:36.270 --> 00:22:36.946 That is,

NOTE Confidence: 0.924920797348022

00:22:36.946 --> 00:22:38.974 high glucose and high insulin levels,

NOTE Confidence: 0.924920797348022

00:22:38.980 --> 00:22:40.720 so type one diabetic individuals

NOTE Confidence: 0.924920797348022

00:22:40.720 --> 00:22:43.190 who take as much insulin as they

NOTE Confidence: 0.924920797348022

00:22:43.190 --> 00:22:45.170 need tend not to have chronically

NOTE Confidence: 0.924920797348022

00:22:45.170 --> 00:22:47.120 high glucose levels all the time,

NOTE Confidence: 0.924920797348022

00:22:47.120 --> 00:22:49.472 and so it may be that keeping blood

NOTE Confidence: 0.924920797348022

00:22:49.472 --> 00:22:51.814 sugar normal is also very important in

NOTE Confidence: 0.924920797348022

00:22:51.814 --> 00:22:53.954 these individuals who need to inject

NOTE Confidence: 0.924920797348022

00:22:53.954 --> 00:22:56.270 insulin exogeneously to stay alive.

NOTE Confidence: 0.924920797348022

00:22:56.270 --> 00:22:58.280 But that's a question that really

NOTE Confidence: 0.924920797348022

00:22:58.280 --> 00:23:00.356 is an open question and one

NOTE Confidence: 0.924920797348022

00:23:00.356 --> 00:23:02.026 that were very curious about.

NOTE Confidence: 0.924920797348022

00:23:02.030 --> 00:23:03.446 It's also entirely possible,

NOTE Confidence: 0.924920797348022

00:23:03.446 --> 00:23:05.963 and I think this is likely that

NOTE Confidence: 0.924920797348022

00:23:05.963 --> 00:23:08.217 insulin may not be the only factor

NOTE Confidence: 0.924920797348022

00:23:08.220 --> 00:23:09.600 that mediates the effects

NOTE Confidence: 0.924920797348022

00:23:09.600 --> 00:23:11.325 of obesity on tumor growth,

NOTE Confidence: 0.924920797348022

00:23:11.330 --> 00:23:13.874 so it may be that you need high

NOTE Confidence: 0.924920797348022

00:23:13.874 --> 00:23:16.061 insulin levels to have an obesity

NOTE Confidence: 0.924920797348022

00:23:16.061 --> 00:23:17.906 affect to drive tumor growth,

NOTE Confidence: 0.924920797348022

00:23:17.910 --> 00:23:20.549 but that you also need other factors

NOTE Confidence: 0.924920797348022

00:23:20.549 --> 00:23:22.020 like inflammatory cytokines or

NOTE Confidence: 0.924920797348022

00:23:22.020 --> 00:23:23.682 leptin or other hormones.

00:23:25.870 --> 00:23:28.243 And in these lean type one diabetic

NOTE Confidence: 0.924920797348022

00:23:28.243 --> 00:23:30.017 individuals they may have high

NOTE Confidence: 0.924920797348022

00:23:30.017 --> 00:23:32.087 insulin levels but not these other

NOTE Confidence: 0.924920797348022

00:23:32.087 --> 00:23:33.856 factors that may be required

NOTE Confidence: 0.924920797348022

00:23:33.856 --> 00:23:35.204 to mediate the effects.

NOTE Confidence: 0.934450626373291

00:23:37.080 --> 00:23:39.072 You know, and that makes me

NOTE Confidence: 0.934450626373291

00:23:39.072 --> 00:23:40.400 think of something else.

NOTE Confidence: 0.934450626373291

00:23:40.400 --> 00:23:42.254 Some people have these benign tumors

NOTE Confidence: 0.934450626373291

00:23:42.254 --> 00:23:44.380 in their pancreas that secrete insulin,

NOTE Confidence: 0.934450626373291

00:23:44.380 --> 00:23:46.767 so it's kind of a little insulin

NOTE Confidence: 0.934450626373291

00:23:46.767 --> 00:23:48.699 factory that they've got going on.

NOTE Confidence: 0.934450626373291

00:23:48.700 --> 00:23:50.360 Are those people at increased

NOTE Confidence: 0.934450626373291

00:23:50.360 --> 00:23:51.688 risk of developing cancer,

NOTE Confidence: 0.934450626373291

00:23:51.690 --> 00:23:53.974 or is it still this,

NOTE Confidence: 0.934450626373291

00:23:53.974 --> 00:23:55.846 you need the interplay of a

NOTE Confidence: 0.934450626373291

00:23:55.846 --> 00:23:57.917 number of factors so they may

NOTE Confidence: 0.934450626373291

00:23:57.917 --> 00:23:59.987 not really be at increased risk.

NOTE Confidence: 0.934450626373291

00:23:59.990 --> 00:24:01.650 So I believe that these

NOTE Confidence: 0.934450626373291

00:24:01.650 --> 00:24:04.298 folks and I could be wrong on this,

NOTE Confidence: 0.934450626373291

00:24:04.300 --> 00:24:05.960 this isn't particularly my field,

NOTE Confidence: 0.934450626373291

00:24:05.960 --> 00:24:07.970 but I believe that those folks

NOTE Confidence: 0.934450626373291

00:24:07.970 --> 00:24:10.298 are at higher risk of pancreatic,

NOTE Confidence: 0.934450626373291

00:24:10.300 --> 00:24:13.009 at least benign tumors of other types,

NOTE Confidence: 0.934450626373291

00:24:13.010 --> 00:24:14.950 and maybe at higher risk

NOTE Confidence: 0.934450626373291

00:24:14.950 --> 00:24:16.114 of pancreatic cancer,

NOTE Confidence: 0.934450626373291

00:24:16.120 --> 00:24:18.358 so that would suggest that insulin

NOTE Confidence: 0.934450626373291

00:24:18.358 --> 00:24:20.719 may be acting within the pancreas

NOTE Confidence: 0.934450626373291

00:24:20.719 --> 00:24:22.704 as a tumor promoting factor,

NOTE Confidence: 0.934450626373291

00:24:22.710 --> 00:24:24.984 but I don't believe they're at

NOTE Confidence: 0.934450626373291

00:24:24.984 --> 00:24:27.369 substantially higher risk in other sites.

NOTE Confidence: 0.934450626373291

00:24:27.370 --> 00:24:29.614 Now this could be because it's

NOTE Confidence: 0.934450626373291

00:24:29.614 --> 00:24:31.593 my understanding that those folks

NOTE Confidence: 0.934450626373291

00:24:31.593 --> 00:24:33.653 aren't allowed to go continuously

NOTE Confidence: 0.934450626373291

00:24:33.653 --> 00:24:35.729 forever with high insulin levels

NOTE Confidence: 0.934450626373291

00:24:35.729 --> 00:24:38.228 secreted by a tumor from the pancreas.

NOTE Confidence: 0.934450626373291

00:24:38.230 --> 00:24:40.878 The tumor will be either removed, or

NOTE Confidence: 0.934450626373291

00:24:40.878 --> 00:24:41.514 treated,

NOTE Confidence: 0.934450626373291

00:24:41.514 --> 00:24:43.422 they may be treated with somatostatin

NOTE Confidence: 0.934450626373291

00:24:43.422 --> 00:24:45.885 or some other agent to prevent the

NOTE Confidence: 0.934450626373291

00:24:45.885 --> 00:24:47.900 high insulin secretion,

NOTE Confidence: 0.934450626373291

00:24:47.900 --> 00:24:50.063 but I would expect that if someone

NOTE Confidence: 0.934450626373291

00:24:50.063 --> 00:24:51.430 were chronically having high

NOTE Confidence: 0.934450626373291

00:24:51.430 --> 00:24:52.946 insulin levels from continuous

NOTE Confidence: 0.934450626373291

00:24:52.946 --> 00:24:54.462 excess secretion of insulin,

NOTE Confidence: 0.934450626373291

00:24:54.470 --> 00:24:57.521 that they would in fact be at risk and

NOTE Confidence: 0.934450626373291

00:24:57.521 --> 00:25:00.700 that is a study that we've done in mice.

NOTE Confidence: 0.934450626373291

00:25:00.700 --> 00:25:03.268 So if you take mice and put a

NOTE Confidence: 0.934450626373291

00:25:03.268 --> 00:25:04.714 subcutaneous insulin pellet into

NOTE Confidence: 0.934450626373291

00:25:04.714 --> 00:25:06.928 them so that they

NOTE Confidence: 0.934450626373291

00:25:06.930 --> 00:25:09.006 chronically have high insulin levels,

NOTE Confidence: 0.934450626373291

00:25:09.010 --> 00:25:11.116 they do develop tumors more quickly

NOTE Confidence: 0.934450626373291

00:25:11.120 --> 00:25:13.460 and do worse with the tumors

NOTE Confidence: 0.934450626373291

00:25:13.460 --> 00:25:15.020 than mice that

NOTE Confidence: 0.934450626373291

00:25:15.020 --> 00:25:16.970 don't have too much circulating

NOTE Confidence: 0.934450626373291

00:25:16.970 --> 00:25:18.530 insulin all the time.

NOTE Confidence: 0.939197421073914

00:25:19.260 --> 00:25:21.507 And when we talked about the fact

NOTE Confidence: 0.939197421073914

00:25:21.507 --> 00:25:24.139 that some of the cancers are increased

NOTE Confidence: 0.939197421073914

00:25:24.139 --> 00:25:26.527 with obesity and insulin is one

NOTE Confidence: 0.939197421073914

00:25:26.602 --> 00:25:28.975 factor that may be playing a role,

NOTE Confidence: 0.939197421073914

00:25:28.980 --> 00:25:30.935 sometimes people talk

NOTE Confidence: 0.939197421073914

00:25:30.935 --> 00:25:32.890 about this thing called insulin

NOTE Confidence: 0.939197421073914

00:25:32.952 --> 00:25:34.377 growth factor or my IGF,

NOTE Confidence: 0.939197421073914

00:25:34.380 --> 00:25:36.900 which can be found in some cancers.

NOTE Confidence: 0.939197421073914

00:25:36.900 --> 00:25:37.959 Are those related?

NOTE Confidence: 0.939197421073914

00:25:37.959 --> 00:25:40.430 So we find that insulin plays more

NOTE Confidence: 0.939197421073914

00:25:40.500 --> 00:25:43.020 of role in people who have tumors

NOTE Confidence: 0.939197421073914

00:25:43.020 --> 00:25:44.820 that have receptors, for example,

NOTE Confidence: 0.939197421073914

00:25:44.820 --> 00:25:46.980 that are more responsive to insulin,

NOTE Confidence: 0.939197421073914

00:25:46.980 --> 00:25:49.860 or is this something that is more ubiquitous?

NOTE Confidence: 0.939197421073914

00:25:49.860 --> 00:25:52.380 At least in these 13 tumor types,

NOTE Confidence: 0.939197421073914

00:25:52.380 --> 00:25:54.190 regardless of whether or not

NOTE Confidence: 0.939197421073914

00:25:54.190 --> 00:25:56.120 the tumor secretes insulin or

NOTE Confidence: 0.939197421073914

00:25:56.120 --> 00:25:57.664 insulin related growth factor,

NOTE Confidence: 0.939197421073914

00:25:57.670 --> 00:25:58.828 there does seem

NOTE Confidence: 0.89475154876709

00:25:58.830 --> 00:26:00.378 to be a relationship

NOTE Confidence: 0.89475154876709

00:26:00.378 --> 00:26:02.313 between my IGF and insulin,

NOTE Confidence: 0.89475154876709

00:26:02.320 --> 00:26:05.029 so that comes in several different ways,

NOTE Confidence: 0.89475154876709

00:26:05.030 --> 00:26:07.487 mostly that the IGF1 and insulin

NOTE Confidence: 0.89475154876709

00:26:07.487 --> 00:26:09.877 receptors are very similar and both

NOTE Confidence: 0.89475154876709

00:26:09.877 --> 00:26:11.987 molecules can activate the other.

NOTE Confidence: 0.89475154876709

00:26:11.990 --> 00:26:15.086 So insulin can activate the IG F1 receptor

NOTE Confidence: 0.89475154876709

00:26:15.090 --> 00:26:17.922 and IG F1 can activate the insulin receptor

NOTE Confidence: 0.89475154876709

00:26:17.922 --> 00:26:21.438 and so I would absolutely expect there to

NOTE Confidence: 0.89475154876709

00:26:21.438 --> 00:26:23.990 be interplay between insulin an IG F1,

NOTE Confidence: 0.89475154876709

00:26:23.990 --> 00:26:25.574 particularly in those

NOTE Confidence: 0.89475154876709

00:26:25.574 --> 00:26:27.158 IGF one expressing tumors.

NOTE Confidence: 0.89475154876709

00:26:27.160 --> 00:26:29.362 This also brings up a good

NOTE Confidence: 0.89475154876709

00:26:29.362 --> 00:26:31.999 point that I want to highlight,

NOTE Confidence: 0.89475154876709

00:26:32.000 --> 00:26:34.821 and that is that the insulin receptor

NOTE Confidence: 0.89475154876709

00:26:34.821 --> 00:26:37.238 is not ubiquitously found in tumors.

NOTE Confidence: 0.89475154876709

00:26:37.240 --> 00:26:39.376 The tumor types that are associated

NOTE Confidence: 0.89475154876709

00:26:39.376 --> 00:26:41.347 with obesity on average have

NOTE Confidence: 0.89475154876709

00:26:41.347 --> 00:26:43.279 higher insulin receptor expression,

NOTE Confidence: 0.89475154876709

00:26:43.280 --> 00:26:46.094 but that's not 100% across the board,

NOTE Confidence: 0.89475154876709

00:26:46.100 --> 00:26:49.727 but because of this cross talk between IGF,1

NOTE Confidence: 0.89475154876709

00:26:49.730 --> 00:26:52.874 and insulin that may explain some of

NOTE Confidence: 0.89475154876709

00:26:52.874 --> 00:26:55.202 the discrepancies there where a tumor

NOTE Confidence: 0.89475154876709

00:26:55.202 --> 00:26:58.230 may be at least weakly obesity associated.

NOTE Confidence: 0.89475154876709

00:26:58.230 --> 00:27:00.211 But may not have the insulin receptor

NOTE Confidence: 0.89475154876709

00:27:00.211 --> 00:27:02.650 and that may be because the IGF1

NOTE Confidence: 0.89475154876709

00:27:02.650 --> 00:27:04.180 receptor compensates for that.

NOTE Confidence: 0.89475154876709

00:27:04.180 --> 00:27:04.543 Unfortunately,

NOTE Confidence: 0.89475154876709

00:27:04.543 --> 00:27:07.084 tumors are evolved to survive very well,

NOTE Confidence: 0.89475154876709

00:27:07.090 --> 00:27:09.876 and so they've sort of developed mechanisms

NOTE Confidence: 0.89475154876709

00:27:09.876 --> 00:27:12.547 in their evolution to be able to survive,

NOTE Confidence: 0.89475154876709

00:27:12.550 --> 00:27:14.740 and one that I think

NOTE Confidence: 0.89475154876709

00:27:14.740 --> 00:27:16.560 is the redundancy of insulin,

NOTE Confidence: 0.89475154876709

00:27:16.560 --> 00:27:18.380 and IGF1 action.

NOTE Confidence: 0.945697069168091

00:27:19.240 --> 00:27:21.824 In our last few

NOTE Confidence: 0.945697069168091

00:27:21.824 --> 00:27:24.454 minutes I really want to get back

NOTE Confidence: 0.945697069168091

00:27:24.454 --> 00:27:26.844 to something you said earlier which

NOTE Confidence: 0.945697069168091

00:27:26.844 --> 00:27:29.310 was breaking the cycle of obesity.

NOTE Confidence: 0.945697069168091

00:27:29.310 --> 00:27:32.294 Can have an impact on reducing cancer risk.

NOTE Confidence: 0.945697069168091

00:27:32.300 --> 00:27:35.276 I wanna make sure I got that straight.

NOTE Confidence: 0.945697069168091

00:27:35.280 --> 00:27:37.392 So if you're overweight and you

NOTE Confidence: 0.945697069168091

00:27:37.392 --> 00:27:39.648 decide to lose weight by cutting

NOTE Confidence: 0.945697069168091

00:27:39.648 --> 00:27:41.988 calories or exercise,

NOTE Confidence: 0.945697069168091

00:27:41.990 --> 00:27:44.594 that actually can reduce your cancer risk.

NOTE Confidence: 0.945697069168091

00:27:44.600 --> 00:27:45.719 Is that right?

NOTE Confidence: 0.924473285675049

00:27:46.240 --> 00:27:47.026 Absolutely, epidemiologically,

NOTE Confidence: 0.924473285675049

00:27:47.026 --> 00:27:49.384 even losing weight within the last

NOTE Confidence: 0.924473285675049

00:27:49.384 --> 00:27:51.480 couple years reduces your cancer risk,

NOTE Confidence: 0.924473285675049

00:27:51.480 --> 00:27:53.718 and so it's best

NOTE Confidence: 0.924473285675049

00:27:53.720 --> 00:27:55.958 of course, if we're normal weight,

NOTE Confidence: 0.924473285675049

00:27:55.960 --> 00:27:57.830 healthy weight throughout our lives.

NOTE Confidence: 0.924473285675049

00:27:57.830 --> 00:27:59.954 But it absolutely can have a

NOTE Confidence: 0.924473285675049

00:27:59.954 --> 00:28:02.319 huge impact to lower cancer risk.

NOTE Confidence: 0.924473285675049

00:28:02.320 --> 00:28:04.190 Losing a little bit of

NOTE Confidence: 0.924473285675049

00:28:04.190 --> 00:28:06.060 weight at really anytime.

NOTE Confidence: 0.924473285675049

00:28:06.060 --> 00:28:09.116 And you know the other point I want

NOTE Confidence: 0.924473285675049

00:28:09.116 --> 00:28:11.822 to highlight is we don't have to be

NOTE Confidence: 0.924473285675049

00:28:11.822 --> 00:28:14.659 back to our high school body weight.

NOTE Confidence: 0.924473285675049

00:28:14.660 --> 00:28:16.560 This is a case where

NOTE Confidence: 0.924473285675049

00:28:16.560 --> 00:28:18.541 Losing 5 to 10% of body weight

NOTE Confidence: 0.924473285675049

00:28:18.541 --> 00:28:20.869 if you're an overweight or obese

NOTE Confidence: 0.924473285675049

00:28:20.869 --> 00:28:23.209 individual can actually almost fully

NOTE Confidence: 0.924473285675049

00:28:23.209 --> 00:28:25.539 normalize your insulin sensitivity,

NOTE Confidence: 0.924473285675049

00:28:25.540 --> 00:28:28.116 and so that can be

NOTE Confidence: 0.924473285675049

00:28:28.116 --> 00:28:30.188 predicted to almost fully normalize

NOTE Confidence: 0.924473285675049

00:28:30.188 --> 00:28:33.289 or reduce the excess risk of obesity,

NOTE Confidence: 0.924473285675049

00:28:33.290 --> 00:28:36.265 and so that is something where

NOTE Confidence: 0.924473285675049

00:28:36.265 --> 00:28:39.068 that loss of five to 10% is something

NOTE Confidence: 0.924473285675049

00:28:39.068 --> 00:28:41.732 that would be much more achievable

NOTE Confidence: 0.924473285675049

00:28:41.732 --> 00:28:43.490 then returning to a quote

NOTE Confidence: 0.924473285675049

00:28:43.490 --> 00:28:46.339 unquote healthy weight for a lot of

NOTE Confidence: 0.943467447390923

00:28:46.340 --> 00:28:47.884 individuals.

NOTE Confidence: 0.943467447390923

00:28:47.884 --> 00:28:49.814 Doctor Rachel Perry is an assistant professor in

NOTE Confidence: 0.943467447390923

00:28:49.814 --> 00:28:51.369 medicine and Endocrinology

NOTE Confidence: 0.943467447390923

00:28:51.370 --> 00:28:53.165 and cellular and Molecular Physiology

NOTE Confidence: 0.943467447390923

00:28:53.165 --> 00:28:55.580 at the Yale School of Medicine.

NOTE Confidence: 0.943467447390923

00:28:55.580 --> 00:28:57.116 If you have questions,

NOTE Confidence: 0.943467447390923

00:28:57.116 --> 00:28:58.652 the address is canceranswers@yale.edu

NOTE Confidence: 0.943467447390923

00:28:58.652 --> 00:29:00.775 and past editions of the program

NOTE Confidence: 0.943467447390923

00:29:00.775 --> 00:29:02.713 are available in audio and written

NOTE Confidence: 0.943467447390923

00:29:02.773 --> 00:29:04.390 form at Yalecancercenter.org.

NOTE Confidence: 0.943467447390923

00:29:04.390 --> 00:29:07.286 We hope you'll join us next week to

NOTE Confidence: 0.943467447390923

00:29:07.286 --> 00:29:10.102 learn more about the fight against

NOTE Confidence: 0.943467447390923

00:29:10.102 --> 00:29:13.120 cancer here on Connecticut public radio.