WEBVTT

00:00:00.000 --> 00:00:02.148 Funding for Yale Cancer Answers is

NOTE Confidence: 0.897060396363636

00:00:02.148 --> 00:00:04.180 provided by Smilow Cancer Hospital.

NOTE Confidence: 0.809999667692308

00:00:06.460 --> 00:00:08.668 Welcome to Yale Cancer Answers with

NOTE Confidence: 0.809999667692308

00:00:08.668 --> 00:00:11.019 your host doctor Anees Chagpar.

NOTE Confidence: 0.809999667692308

00:00:11.020 --> 00:00:12.870 Yale Cancer Answers features the

NOTE Confidence: 0.809999667692308

00:00:12.870 --> 00:00:15.149 latest information on cancer care by

NOTE Confidence: 0.809999667692308

00:00:15.149 --> 00:00:16.609 welcoming oncologists and specialists

NOTE Confidence: 0.809999667692308

00:00:16.609 --> 00:00:19.033 who are on the forefront of the

NOTE Confidence: 0.809999667692308

00:00:19.033 --> 00:00:20.836 battle to fight cancer. This week,

NOTE Confidence: 0.809999667692308

00:00:20.836 --> 00:00:22.984 it's a conversation about liver toxic

NOTE Confidence: 0.809999667692308

00:00:22.984 --> 00:00:25.160 medications and cancer risk with doctors,

NOTE Confidence: 0.809999667692308

00:00:25.160 --> 00:00:27.420 Amy Justice and Vin Lo Rey.

NOTE Confidence: 0.809999667692308

00:00:27.420 --> 00:00:29.611 Dr Justice is the CNH Long professor

NOTE Confidence: 0.809999667692308

00:00:29.611 --> 00:00:31.820 of medicine in general Medicine and

NOTE Confidence: 0.809999667692308

00:00:31.820 --> 00:00:34.220 Professor of public health and health

NOTE Confidence: 0.809999667692308

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00:00:34.220 --> 00:00:36.590 policy at the Yale School of Medicine.

NOTE Confidence: 0.809999667692308

00:00:36.590 --> 00:00:38.978 Doctor Lo Rey is an associate professor

NOTE Confidence: 0.809999667692308

00:00:38.978 --> 00:00:41.047 of medicine and epidemiology at

NOTE Confidence: 0.809999667692308

00:00:41.047 --> 00:00:42.687 the University of Pennsylvania,

NOTE Confidence: 0.809999667692308

00:00:42.690 --> 00:00:44.742 and Doctor Chagpar is a professor

NOTE Confidence: 0.809999667692308

00:00:44.742 --> 00:00:46.480 of surgical oncology at Yale.

NOTE Confidence: 0.831807995714286

00:00:47.650 --> 00:00:50.688 Maybe I'll start with you doctor Justice.

NOTE Confidence: 0.831807995714286

00:00:50.690 --> 00:00:53.444 Can you tell us a little bit about yourself,

NOTE Confidence: 0.831807995714286

00:00:53.450 --> 00:00:56.216 your research, and what you do?

NOTE Confidence: 0.917925794444444

00:00:56.730 --> 00:00:59.940 So I'm a general internist and

NOTE Confidence: 0.917925794444444

00:00:59.940 --> 00:01:01.545 a clinical epidemiologist,

NOTE Confidence: 0.917925794444444

00:01:01.550 --> 00:01:04.539 and I have spent my career using

NOTE Confidence: 0.917925794444444

00:01:04.539 --> 00:01:06.869 VA electronic health record data,

NOTE Confidence: 0.917925794444444

00:01:06.870 --> 00:01:09.618 which is the paperless electronic health

NOTE Confidence: 0.917925794444444

00:01:09.618 --> 00:01:13.089 record that the VA keeps nationally on.

NOTE Confidence: 0.917925794444444

00:01:13.090 --> 00:01:15.515 Everyone who gets care in the system to

NOTE Confidence: 0.917925794444444

00:01:15.515 --> 00:01:17.705 try to study important chronic diseases,

NOTE Confidence: 0.917925794444444

00:01:17.710 --> 00:01:20.074 including HIV and cancer.

NOTE Confidence: 0.917925794444444

00:01:20.074 --> 00:01:21.256 Among others,

NOTE Confidence: 0.917925794444444

00:01:21.260 --> 00:01:23.136 and I've had the great pleasure of

NOTE Confidence: 0.917925794444444

00:01:23.136 --> 00:01:24.852 being able to collaborate closely

NOTE Confidence: 0.917925794444444

00:01:24.852 --> 00:01:27.408 with a number of wonderful investigators,

NOTE Confidence: 0.917925794444444

00:01:27.410 --> 00:01:29.797 Vin Lo Rey being one of them so

NOTE Confidence: 0.917925794444444

00:01:29.797 --> 00:01:32.479 that we can really leverage that

NOTE Confidence: 0.917925794444444

00:01:32.479 --> 00:01:35.020 data to understand how best to

NOTE Confidence: 0.917925794444444

00:01:35.020 --> 00:01:37.130 care for people using real-world

NOTE Confidence: 0.917925794444444

00:01:37.130 --> 00:01:39.605 data in real world settings.

00:01:40.270 --> 00:01:41.896 That's a very nice

NOTE Confidence: 0.842264167777778

00:01:41.896 --> 00:01:43.424 segue for you, Doctor Lo Rey.

NOTE Confidence: 0.842264167777778

00:01:43.424 --> 00:01:45.566 Tell us a little bit about

NOTE Confidence: 0.842264167777778

00:01:45.566 --> 00:01:47.552 yourself and what it is that

NOTE Confidence: 0.842264167777778

00:01:47.552 --> 00:01:49.057 you do and your research.

NOTE Confidence: 0.933314322

00:01:50.040 --> 00:01:53.178 Yeah, so I'm an infectious disease

NOTE Confidence: 0.933314322

00:01:53.178 --> 00:01:55.270 physician and clinical epidemiologist

NOTE Confidence: 0.933314322

00:01:55.343 --> 00:01:57.738 at the University of Pennsylvania

NOTE Confidence: 0.933314322

00:01:57.740 --> 00:02:02.052 and my focus has been on evaluating

NOTE Confidence: 0.933314322

00:02:02.052 --> 00:02:05.535 factors associated with acute and

NOTE Confidence: 0.933314322

00:02:05.535 --> 00:02:08.595 chronic liver disease progression.

NOTE Confidence: 0.933314322

00:02:08.600 --> 00:02:12.545 Also using real-world electronic health

NOTE Confidence: 0.933314322

00:02:12.545 --> 00:02:16.490 record or administrative claims data.

NOTE Confidence: 0.933314322

00:02:16.490 --> 00:02:20.420 I, as of a infectious disease

NOTE Confidence: 0.933314322

00:02:20.420 --> 00:02:23.895 physician care primarily for patients

NOTE Confidence: 0.933314322

00:02:23.895 --> 00:02:26.886 with chronic viral hepatitis or

NOTE Confidence: 0.933314322

00:02:26.886 --> 00:02:29.706 with or without HIV COINFECTION,

NOTE Confidence: 0.933314322

00:02:29.710 --> 00:02:32.188 and my goal has been to try

NOTE Confidence: 0.933314322

00:02:32.188 --> 00:02:34.891 to reduce the risk of adverse

NOTE Confidence: 0.933314322

00:02:34.891 --> 00:02:37.600 outcomes in these populations.

NOTE Confidence: 0.933314322

00:02:37.600 --> 00:02:38.330 So

NOTE Confidence: 0.930993905

00:02:38.500 --> 00:02:40.744 Amy, one question that I always

NOTE Confidence: 0.930993905

00:02:40.744 --> 00:02:43.082 start off with and it's a

NOTE Confidence: 0.930993905

00:02:43.082 --> 00:02:45.187 little tangential to where this

NOTE Confidence: 0.930993905

00:02:45.187 --> 00:02:47.019 conversation will ultimately take us,

NOTE Confidence: 0.930993905

00:02:47.020 --> 00:02:49.548 but tell me a little bit more about

NOTE Confidence: 0.930993905

00:02:49.548 --> 00:02:51.760 how this collaboration formed.

NOTE Confidence: 0.930993905

00:02:51.760 --> 00:02:53.900 I'm always interested in how

NOTE Confidence: 0.930993905

00:02:53.900 --> 00:02:55.612 people from different backgrounds,

NOTE Confidence: 0.930993905

00:02:55.620 --> 00:02:57.284 different institutions can kind

NOTE Confidence: 0.930993905

00:02:57.284 --> 00:02:59.780 of get together to make really

NOTE Confidence: 0.930993905

00:02:59.853 --> 00:03:01.599 meaningful collaborations.

NOTE Confidence: 0.930993905

00:03:01.600 --> 00:03:03.112 So can you tell us a little

NOTE Confidence: 0.930993905

00:03:03.112 --> 00:03:04.428 bit more about how you met?

NOTE Confidence: 0.689384429

00:03:05.190 --> 00:03:06.490 Sure, happy to do that.

NOTE Confidence: 0.8461528525

00:03:07.940 --> 00:03:08.868 One of the things

NOTE Confidence: 0.776963912

00:03:08.880 --> 00:03:12.156 that working with the VA national

NOTE Confidence: 0.776963912

00:03:12.156 --> 00:03:14.524 database has allowed me to do is to

NOTE Confidence: 0.776963912

00:03:14.524 --> 00:03:16.396 provide a resource to other people

NOTE Confidence: 0.776963912

00:03:16.396 --> 00:03:18.300 who want to ask clinically relevant

NOTE Confidence: 0.776963912

00:03:18.300 --> 00:03:20.286 questions and get a little guidance

NOTE Confidence: 0.776963912

00:03:20.286 --> 00:03:23.628 from me about how to do that.

NOTE Confidence: 0.776963912

00:03:23.630 --> 00:03:25.828 Then and I met in two ways.

NOTE Confidence: 0.776963912

00:03:25.830 --> 00:03:28.190 One was I had been at his alma

NOTE Confidence: 0.776963912

00:03:28.190 --> 00:03:30.067 mater or where he is now,

NOTE Confidence: 0.776963912

00:03:30.070 --> 00:03:31.555 University of Pennsylvania for a

NOTE Confidence: 0.776963912

00:03:31.555 --> 00:03:33.341 number of years and actually worked

NOTE Confidence: 0.776963912

00:03:33.341 --> 00:03:35.502 with one of his mentors, Brian Strom.

NOTE Confidence: 0.776963912

00:03:35.502 --> 00:03:39.110 So he he knew of me through Brian,

NOTE Confidence: 0.776963912

00:03:39.110 --> 00:03:40.706 I believe, and also through the

NOTE Confidence: 0.776963912

00:03:40.706 --> 00:03:41.504 University of Pennsylvania.

NOTE Confidence: 0.776963912

00:03:41.510 --> 00:03:44.441 And we also attended an international

NOTE Confidence: 0.776963912

00:03:44.441 --> 00:03:47.507 meeting of people who work with

NOTE Confidence: 0.776963912

00:03:47.507 --> 00:03:49.628 large cohorts called I WAD,

NOTE Confidence: 0.776963912

00:03:49.628 --> 00:03:51.824 which is always held someplace in

NOTE Confidence: 0.776963912

00:03:51.824 --> 00:03:53.965 Europe in the offseason so that

NOTE Confidence: 0.776963912

00:03:53.965 --> 00:03:56.579 we can get lower rates on hotels.

NOTE Confidence: 0.776963912

00:03:56.580 --> 00:03:58.316 And it's a small group of people,

NOTE Confidence: 0.776963912

00:03:58.320 --> 00:04:00.582 about 100 people who all work

NOTE Confidence: 0.776963912

00:04:00.582 --> 00:04:01.713 with observational data.

NOTE Confidence: 0.776963912

00:04:01.720 --> 00:04:04.012 Real-world data to try to understand

NOTE Confidence: 0.776963912

00:04:04.012 --> 00:04:05.540 issues around health outcomes,

NOTE Confidence: 0.776963912

00:04:05.540 --> 00:04:06.920 particularly in people with

NOTE Confidence: 0.776963912

00:04:06.920 --> 00:04:08.300 HIV and hepatitis C.

NOTE Confidence: 0.776963912

00:04:08.300 --> 00:04:09.840 But the methodologic issues are

NOTE Confidence: 0.776963912

00:04:09.840 --> 00:04:11.680 relevant for other questions as well.

NOTE Confidence: 0.81322707

00:04:13.200 --> 00:04:16.136 So, so then let's pick up that conversation.

00:04:16.140 --> 00:04:18.250 You had mentioned that you're

00:04:18.250 --> 00:04:19.516 an infectious disease.

00:04:19.520 --> 00:04:21.380 Doctor, you're particularly

00:04:21.380 --> 00:04:24.480 interested in hepatitis and HIV.

00:04:24.480 --> 00:04:27.207 So tell us a little bit more about how

00:04:27.207 --> 00:04:29.710 this kind of coincides with cancer.

00:04:31.560 --> 00:04:35.862 Yeah well so. As an infectious disease

00:04:35.862 --> 00:04:38.590 physician caring for people with HIV and

00:04:38.590 --> 00:04:41.246 viral hepatitis very early on in my career,

00:04:41.250 --> 00:04:46.546 I was observing that many of them were

00:04:46.546 --> 00:04:49.664 dying from advanced liver disease.

00:04:49.664 --> 00:04:50.860 Either decompensated

00:04:50.860 --> 00:04:53.252 cirrhosis or liver cancer.

00:04:53.260 --> 00:04:57.719 And particularly in the setting of HIV,

00:04:57.720 --> 00:05:00.520 chronic hepatitis B or C

00:05:00.520 --> 00:05:02.200 really is accelerated.

NOTE Confidence: 0.916672233333333

00:05:02.200 --> 00:05:04.588 There's an accelerated progression

NOTE Confidence: 0.916672233333333

00:05:04.588 --> 00:05:07.573 of liver fibrosis to cirrhosis.

NOTE Confidence: 0.916672233333333

00:05:07.580 --> 00:05:12.240 And then once cirrhosis develops,

NOTE Confidence: 0.916672233333333

00:05:12.240 --> 00:05:14.192 there's a very rapid

NOTE Confidence: 0.916672233333333

00:05:14.192 --> 00:05:16.144 progression to liver cancer.

NOTE Confidence: 0.916672233333333

00:05:16.150 --> 00:05:18.130 What Amy and I have discovered

NOTE Confidence: 0.916672233333333

00:05:18.130 --> 00:05:19.900 over the past several years,

NOTE Confidence: 0.916672233333333

00:05:19.900 --> 00:05:23.888 specifically focusing on HIV

NOTE Confidence: 0.916672233333333

00:05:23.888 --> 00:05:26.879 related hepatocellular carcinoma,

NOTE Confidence: 0.916672233333333

00:05:26.880 --> 00:05:30.032 is that HIV viremia,

NOTE Confidence: 0.916672233333333

00:05:30.032 --> 00:05:33.972 independent of other traditional factors,

NOTE Confidence: 0.916672233333333

00:05:33.980 --> 00:05:37.590 is a really important determinant.

NOTE Confidence: 0.916672233333333

00:05:37.590 --> 00:05:41.692 Of of primary liver cancer and

NOTE Confidence: 0.916672233333333

00:05:41.692 --> 00:05:45.702 we've analyzed HIV VIRAEMIA in

NOTE Confidence: 0.916672233333333

00:05:45.702 --> 00:05:49.584 many different ways to really

NOTE Confidence: 0.916672233333333

00:05:49.584 --> 00:05:54.006 provide the first evidence that HIV

NOTE Confidence: 0.916672233333333

00:05:54.006 --> 00:05:57.190 VIRAEMIA is an important reason

NOTE Confidence: 0.916672233333333

00:05:57.190 --> 00:06:00.018 why this subgroup is observed.

NOTE Confidence: 0.916672233333333

00:06:00.018 --> 00:06:04.190 To have such a high rate of of liver cancer.

NOTE Confidence: 0.916672233333333

00:06:04.190 --> 00:06:05.660 So that's sort of the the link,

NOTE Confidence: 0.760903331538461

00:06:06.130 --> 00:06:07.467 and he said if I can just

NOTE Confidence: 0.760903331538461

00:06:07.467 --> 00:06:08.880 jump in there because I think.

NOTE Confidence: 0.760903331538461

00:06:08.880 --> 00:06:10.742 But it points to a larger issue

NOTE Confidence: 0.760903331538461

00:06:10.742 --> 00:06:12.250 which is relevant for cancers.

NOTE Confidence: 0.760903331538461

00:06:12.250 --> 00:06:14.465 More generally, overtime we've come

NOTE Confidence: 0.760903331538461

00:06:14.465 --> 00:06:17.172 to appreciate that any number of

NOTE Confidence: 0.760903331538461

00:06:17.172 --> 00:06:19.282 chronic viral infections are associated

NOTE Confidence: 0.760903331538461

00:06:19.282 --> 00:06:21.999 with risk of cancer in the future,

NOTE Confidence: 0.760903331538461

00:06:22.000 --> 00:06:24.570 and HIV is just one of the more recent ones.

NOTE Confidence: 0.760903331538461

00:06:24.570 --> 00:06:26.593 There's a there's a whole list of

NOTE Confidence: 0.760903331538461

00:06:26.593 --> 00:06:28.859 viruses that are associated with cancer,

NOTE Confidence: 0.760903331538461

00:06:28.860 --> 00:06:31.458 and this is not that well

NOTE Confidence: 0.760903331538461

00:06:31.458 --> 00:06:33.860 appreciated by the general public.

NOTE Confidence: 0.760903331538461

00:06:33.860 --> 00:06:36.332 So when people talk about getting

NOTE Confidence: 0.760903331538461

00:06:36.332 --> 00:06:37.980 vaccinations to avoid cancer,

NOTE Confidence: 0.760903331538461

00:06:37.980 --> 00:06:39.740 that's what part of what

NOTE Confidence: 0.760903331538461

00:06:39.740 --> 00:06:41.500 we're trying to talk about.

NOTE Confidence: 0.760903331538461

00:06:41.500 --> 00:06:44.620 And by studying HIV and its

NOTE Confidence: 0.760903331538461

00:06:44.620 --> 00:06:45.850 association with cancer,

NOTE Confidence: 0.760903331538461

00:06:45.850 --> 00:06:47.434 we also hope to gain insights

NOTE Confidence: 0.760903331538461

00:06:47.434 --> 00:06:48.940 into these other viruses as well.

NOTE Confidence: 0.826778525

00:06:50.150 --> 00:06:56.508 And so. So, so that's a good a good point.

NOTE Confidence: 0.826778525

00:06:56.510 --> 00:06:59.741 So back to you've in you know when we

NOTE Confidence: 0.826778525

00:06:59.741 --> 00:07:03.455 talk about HIV viremia increasing the risk

NOTE Confidence: 0.826778525

00:07:03.455 --> 00:07:07.085 of of hepatocellular or liver cancers.

NOTE Confidence: 0.826778525

00:07:07.090 --> 00:07:10.278 What I mean is there what's

NOTE Confidence: 0.826778525

00:07:10.278 --> 00:07:12.068 the downstream effect of that?

NOTE Confidence: 0.826778525

00:07:12.070 --> 00:07:16.120 I mean, is it that we we don't currently,

NOTE Confidence: 0.826778525

00:07:16.120 --> 00:07:19.470 to my knowledge, have a vaccine against HIV?

NOTE Confidence: 0.826778525

00:07:19.470 --> 00:07:22.358 Are there ways that we can reduce viral

NOTE Confidence: 0.826778525

00:07:22.358 --> 00:07:26.031 load that we know would be beneficial in

NOTE Confidence: 0.826778525

00:07:26.031 --> 00:07:28.540 terms of preventing hepatocellular cancer?

NOTE Confidence: 0.824503248333333

00:07:30.030 --> 00:07:33.720 In fact, that's that's a key point that

NOTE Confidence: 0.824503248333333

00:07:33.720 --> 00:07:37.440 you bring up that antiretroviral therapy,

NOTE Confidence: 0.824503248333333

00:07:37.440 --> 00:07:40.448 which can suppress HIV.

NOTE Confidence: 0.824503248333333

00:07:40.448 --> 00:07:44.410 Viraemia can reduce the rates of

NOTE Confidence: 0.824503248333333

00:07:44.410 --> 00:07:47.750 primary liver cancer, and in fact,

NOTE Confidence: 0.824503248333333

00:07:47.750 --> 00:07:51.980 whether you have HIV and hepatitis B or C,

NOTE Confidence: 0.824503248333333

00:07:51.980 --> 00:07:55.200 Co infection or HIV alone,

NOTE Confidence: 0.824503248333333

00:07:55.200 --> 00:07:59.730 durable suppression of HIV viremia.

NOTE Confidence: 0.824503248333333

00:07:59.730 --> 00:08:03.690 Can really reduce risk of primary

NOTE Confidence: 0.824503248333333

00:08:03.690 --> 00:08:05.670 liver cancer considerably.

NOTE Confidence: 0.858808983333333

00:08:07.030 --> 00:08:10.486 And so, Amy, you know you had you

NOTE Confidence: 0.858808983333333

00:08:10.486 --> 00:08:13.074 had mentioned vaccines and when

NOTE Confidence: 0.858808983333333

00:08:13.074 --> 00:08:15.779 we think about liver disease,

NOTE Confidence: 0.858808983333333

00:08:15.780 --> 00:08:19.945 certainly we have a hepatitis B vaccine.

NOTE Confidence: 0.858808983333333

00:08:19.950 --> 00:08:24.157 Do we know that that actually prevents

NOTE Confidence: 0.858808983333333

00:08:24.157 --> 00:08:27.630 people from getting a liver cancer,

NOTE Confidence: 0.858808983333333

00:08:27.630 --> 00:08:30.450 or at least reduces their risk? It

NOTE Confidence: 0.86942622

00:08:30.460 --> 00:08:32.048 substantially reduces their risk.

NOTE Confidence: 0.86942622

00:08:32.048 --> 00:08:34.662 Hepatitis B infection is actually one of

NOTE Confidence: 0.86942622

00:08:34.662 --> 00:08:37.364 the worst actors in terms of risk of.

NOTE Confidence: 0.86942622

00:08:37.370 --> 00:08:39.335 Liver cancer, the associated risk

NOTE Confidence: 0.86942622

00:08:39.335 --> 00:08:41.770 with hepatitis B is quite large,

NOTE Confidence: 0.86942622

00:08:41.770 --> 00:08:44.110 so by getting the vaccine and

NOTE Confidence: 0.86942622

00:08:44.110 --> 00:08:45.670 avoiding hepatitis B infection,

NOTE Confidence: 0.86942622

00:08:45.670 --> 00:08:47.394 one can certainly decrease

13

NOTE Confidence: 0.86942622

00:08:47.394 --> 00:08:49.549 one's risk of liver cancer.

NOTE Confidence: 0.86942622

00:08:49.550 --> 00:08:51.788 Liver cancer, like most other cancers,

NOTE Confidence: 0.86942622

00:08:51.790 --> 00:08:54.000 is a multi hit phenomenon.

NOTE Confidence: 0.86942622

00:08:54.000 --> 00:08:55.715 So there's the issue of viral exposure

NOTE Confidence: 0.86942622

00:08:55.715 --> 00:08:57.358 that we've just been talking about.

NOTE Confidence: 0.86942622

00:08:57.360 --> 00:09:00.501 There's the issue of alcohol harmful

NOTE Confidence: 0.86942622

00:09:00.501 --> 00:09:03.098 use of alcohol can also increase risk.

NOTE Confidence: 0.86942622

00:09:03.100 --> 00:09:05.214 There's the risk of toxicity from other

NOTE Confidence: 0.86942622

00:09:05.214 --> 00:09:07.020 medications, which Ben is focused on.

NOTE Confidence: 0.86942622

00:09:07.020 --> 00:09:09.456 All of these factors can influence the

NOTE Confidence: 0.86942622

00:09:09.456 --> 00:09:11.859 total risk that an individual faces,

NOTE Confidence: 0.86942622

00:09:11.860 --> 00:09:13.852 and so we're trying to attack

NOTE Confidence: 0.86942622

00:09:13.852 --> 00:09:15.700 this issue on multiple fronts.

NOTE Confidence: 0.845099120714286

00:09:17.360 --> 00:09:20.096 And so I want to pick up on on

NOTE Confidence: 0.845099120714286

00:09:20.096 --> 00:09:22.405 what you said Amy about medications

NOTE Confidence: 0.845099120714286

00:09:22.405 --> 00:09:24.475 that are toxic to the liver,

NOTE Confidence: 0.845099120714286

00:09:24.480 --> 00:09:27.200 but just to kind of round out the

NOTE Confidence: 0.845099120714286

00:09:27.200 --> 00:09:29.420 discussion with regards to hepatitis,

NOTE Confidence: 0.845099120714286

00:09:29.420 --> 00:09:33.458 I think one of the important

NOTE Confidence: 0.845099120714286

00:09:33.460 --> 00:09:35.190 contributions that have been made

NOTE Confidence: 0.845099120714286

00:09:35.190 --> 00:09:38.016 over the last several years is a

NOTE Confidence: 0.845099120714286

00:09:38.016 --> 00:09:41.680 medication that purportedly can

NOTE Confidence: 0.845099120714286

00:09:41.680 --> 00:09:43.977 actually eliminate hepatitis C.

NOTE Confidence: 0.845099120714286

00:09:43.977 --> 00:09:48.409 Do we know that people who are treated with.

NOTE Confidence: 0.845099120714286

00:09:48.410 --> 00:09:52.326 This medication can reduce their risk

NOTE Confidence: 0.845099120714286

00:09:52.326 --> 00:09:54.630 even if they had hepatitis C. Even

NOTE Confidence: 0.810242275333333

00:09:55.210 --> 00:09:58.430 yes, hepatitis C, direct acting

NOTE Confidence: 0.810242275333333

00:09:58.430 --> 00:10:01.006 antiviral treatment can dramatically

NOTE Confidence: 0.810242275333333

00:10:01.006 --> 00:10:03.886 reduce the risk of liver cancer.

NOTE Confidence: 0.810242275333333

00:10:03.890 --> 00:10:06.656 Cure of hepatitis C really is

NOTE Confidence: 0.810242275333333

00:10:06.656 --> 00:10:09.872 a key factor in decreasing risk

NOTE Confidence: 0.810242275333333

00:10:09.872 --> 00:10:13.047 of liver disease and liver

NOTE Confidence: 0.810242275333333

00:10:13.047 --> 00:10:16.080 cancer from chronic hepatitis.

NOTE Confidence: 0.810242275333333

00:10:16.080 --> 00:10:18.890 These are therapies that are

NOTE Confidence: 0.810242275333333

00:10:18.890 --> 00:10:21.138 taken orally once daily.

NOTE Confidence: 0.810242275333333

00:10:21.140 --> 00:10:24.732 For 8 to 12 weeks and have a 95

NOTE Confidence: 0.810242275333333

00:10:24.732 --> 00:10:27.684 plus percent cure rate and with

NOTE Confidence: 0.810242275333333

00:10:27.684 --> 00:10:30.439 cure of chronic hepatitis C,

NOTE Confidence: 0.810242275333333

00:10:30.440 --> 00:10:32.384 the risk of liver cancer dramatically

NOTE Confidence: 0.810242275333333

00:10:32.384 --> 00:10:34.010 reduces over the long term.

NOTE Confidence: 0.794243261111111

00:10:34.810 --> 00:10:38.086 So Amy, this brings us to the question of,

NOTE Confidence: 0.794243261111111

00:10:38.090 --> 00:10:40.770 you know, if you already had hepatitis C,

NOTE Confidence: 0.794243261111111

00:10:40.770 --> 00:10:44.490 but that you can take a drug which cures you,

NOTE Confidence: 0.794243261111111

00:10:44.490 --> 00:10:47.186 you can reduce your risk of liver cancer.

NOTE Confidence: 0.794243261111111

00:10:47.190 --> 00:10:49.170 So with all of these other

NOTE Confidence: 0.794243261111111

00:10:49.170 --> 00:10:50.490 toxins that you mentioned,

NOTE Confidence: 0.794243261111111

00:10:50.490 --> 00:10:54.876 whether it's alcohol or other drugs

NOTE Confidence: 0.794243261111111

00:10:54.876 --> 00:10:59.378 that cause an injury to the liver.

NOTE Confidence: 0.794243261111111

00:10:59.380 --> 00:11:01.224 These are those irreversible.

NOTE Confidence: 0.794243261111111

00:11:01.224 --> 00:11:04.450 It sounds like these all might be

NOTE Confidence: 0.794243261111111

00:11:04.450 --> 00:11:06.754 in fact reversible if they follow

NOTE Confidence: 0.794243261111111

00:11:06.754 --> 00:11:09.058 the same kind of pattern as,

NOTE Confidence: 0.794243261111111

00:11:09.060 --> 00:11:11.027 as with hepatitis C, is that right?

NOTE Confidence: 0.90087761125

00:11:12.330 --> 00:11:15.240 Well, that's a very important and

NOTE Confidence: 0.90087761125

00:11:15.240 --> 00:11:17.548 interesting question. As we age,

NOTE Confidence: 0.90087761125

00:11:17.548 --> 00:11:20.670 our bodies undergo a number of insults.

NOTE Confidence: 0.90087761125

00:11:20.670 --> 00:11:22.342 At some point, though,

NOTE Confidence: 0.90087761125

00:11:22.342 --> 00:11:24.432 the cumulative injury from those

NOTE Confidence: 0.90087761125

00:11:24.432 --> 00:11:26.304 insults on almost any organ

NOTE Confidence: 0.90087761125

00:11:26.304 --> 00:11:28.374 system in the liver is included.

NOTE Confidence: 0.90087761125

00:11:28.380 --> 00:11:29.556 Becomes largely irreversible,

NOTE Confidence: 0.90087761125

00:11:29.556 --> 00:11:32.794 so the trick is to try to catch

NOTE Confidence: 0.90087761125

00:11:32.794 --> 00:11:35.314 it before that happens and reverse

NOTE Confidence: 0.90087761125

00:11:35.314 --> 00:11:37.466 those behaviors or those exposures

NOTE Confidence: 0.90087761125

00:11:37.466 --> 00:11:39.496 before they cross that threshold

NOTE Confidence: 0.90087761125

00:11:39.496 --> 00:11:42.214 into a a more irreversible state.

NOTE Confidence: 0.90087761125

00:11:42.214 --> 00:11:45.700 We talk a lot about liver cirrhosis

NOTE Confidence: 0.90087761125

00:11:45.700 --> 00:11:47.868 and we used to think that even liver

NOTE Confidence: 0.90087761125

00:11:47.868 --> 00:11:49.567 cirrhosis was that liver cirrhosis

NOTE Confidence: 0.90087761125

00:11:49.567 --> 00:11:51.397 wasn't reversible to some extent.

NOTE Confidence: 0.90087761125

00:11:51.400 --> 00:11:52.789 It can be,

NOTE Confidence: 0.90087761125

00:11:52.789 --> 00:11:55.567 but obviously the earlier we intervene

NOTE Confidence: 0.90087761125

00:11:55.567 --> 00:11:59.449 and stop those exposures stop those harms.

NOTE Confidence: 0.90087761125

00:11:59.450 --> 00:12:01.540 The less likely this process

NOTE Confidence: 0.90087761125

00:12:01.540 --> 00:12:02.794 will become irreversible.

NOTE Confidence: 0.898384803333333

00:12:04.060 --> 00:12:06.720 So then I wanna pick up the

NOTE Confidence: 0.898384803333333

00:12:06.720 --> 00:12:08.776 conversation with you on medications

NOTE Confidence: 0.898384803333333

00:12:08.776 --> 00:12:11.278 that are toxic to the liver.

NOTE Confidence: 0.898384803333333

00:12:11.280 --> 00:12:13.524 I mean, we've all heard about

NOTE Confidence: 0.898384803333333

00:12:13.524 --> 00:12:16.553 alcohol and I I think our listeners

NOTE Confidence: 0.898384803333333

00:12:16.553 --> 00:12:18.480 know that alcohol certainly

NOTE Confidence: 0.898384803333333

00:12:18.480 --> 00:12:21.360 is is toxic to the liver.

NOTE Confidence: 0.898384803333333

00:12:21.360 --> 00:12:23.616 Maybe before we get to medications,

NOTE Confidence: 0.898384803333333

00:12:23.620 --> 00:12:25.474 I'll ask you the question that

NOTE Confidence: 0.898384803333333

00:12:25.474 --> 00:12:27.010 everybody is going to ask.

NOTE Confidence: 0.898384803333333

00:12:27.010 --> 00:12:29.096 Is there a safe dose of alcohol

NOTE Confidence: 0.898384803333333

00:12:29.096 --> 00:12:31.378 that is not toxic to the liver?

NOTE Confidence: 0.940904165833333

00:12:32.750 --> 00:12:34.718 Well, I think that,

NOTE Confidence: 0.940904165833333

00:12:34.718 --> 00:12:36.686 particularly with people with

NOTE Confidence: 0.940904165833333

00:12:36.686 --> 00:12:38.729 pre-existing chronic liver disease,

NOTE Confidence: 0.940904165833333

00:12:38.730 --> 00:12:42.162 there really may be no safe

NOTE Confidence: 0.940904165833333

00:12:42.162 --> 00:12:44.450 level of of alcohol.

NOTE Confidence: 0.940904165833333

00:12:44.450 --> 00:12:47.366 Amy and I had done a study several years

00:12:47.366 --> 00:12:50.007 back where we looked at particularly

00:12:50.010 --> 00:12:54.828 the extent of consumption of alcohol,

00:12:54.830 --> 00:12:57.390 non hazardous, hazardous abuse,

00:12:57.390 --> 00:13:00.124 dependence according to different

00:13:00.124 --> 00:13:02.218 presences of hepatitis.

00:13:02.220 --> 00:13:05.814 In HIV, and particularly for persons

00:13:05.814 --> 00:13:09.540 with HIV and hepatitis coinfection,

00:13:09.540 --> 00:13:12.095 even those who had non hazardous drinking,

00:13:12.100 --> 00:13:15.502 it was associated with pretty substantial

00:13:15.502 --> 00:13:18.680 advanced liver fibrosis and cirrhosis.

00:13:23.260 --> 00:13:24.097 In those instances,

00:13:24.097 --> 00:13:26.750 there really is no safe level of alcohol use.

00:13:27.660 --> 00:13:30.278 Well, that certainly is a sobering

00:13:30.278 --> 00:13:32.638 comment to end our first half of

00:13:32.638 --> 00:13:35.080 our segment on and no pun intended.

00:13:35.080 --> 00:13:36.564 But we're going to take a short

NOTE Confidence: 0.886753951904762

00:13:36.564 --> 00:13:38.000 break for a medical minute.

NOTE Confidence: 0.886753951904762

00:13:38.000 --> 00:13:40.184 Please stay tuned to learn more

NOTE Confidence: 0.886753951904762

00:13:40.184 --> 00:13:42.015 about liver toxic medications and

NOTE Confidence: 0.886753951904762

00:13:42.015 --> 00:13:43.968 cancer risk with my guests doctor

NOTE Confidence: 0.886753951904762

00:13:43.968 --> 00:13:46.416 Amy Justice, and Doctor Vin Lo Rey.

NOTE Confidence: 0.839401012

00:13:47.040 --> 00:13:48.945 Funding for Yale Cancer Answers

NOTE Confidence: 0.839401012

00:13:48.945 --> 00:13:50.850 comes from Smilow Cancer Hospital

NOTE Confidence: 0.839401012

00:13:50.850 --> 00:13:53.058 where a wide spectrum of advanced

NOTE Confidence: 0.839401012

00:13:53.058 --> 00:13:55.463 strategies for the diagnosis and treatment

NOTE Confidence: 0.839401012

00:13:55.463 --> 00:13:57.628 of gynecological cancers are offered.

NOTE Confidence: 0.839401012

00:13:57.630 --> 00:14:01.694 To learn more, visit Yale Cancer Center org.

NOTE Confidence: 0.935122191111111

00:14:05.360 --> 00:14:06.970 There are many obstacles to

NOTE Confidence: 0.935122191111111

00:14:06.970 --> 00:14:08.258 face when quitting smoking.

NOTE Confidence: 0.935122191111111

00:14:08.260 --> 00:14:10.120 As smoking involves the potent drug.

NOTE Confidence: 0.935122191111111

00:14:10.120 --> 00:14:12.385 Nicotine quitting smoking is a

NOTE Confidence: 0.935122191111111

00:14:12.385 --> 00:14:14.197 very important lifestyle change,

NOTE Confidence: 0.935122191111111

00:14:14.200 --> 00:14:15.679 especially for patients

NOTE Confidence: 0.935122191111111

00:14:15.679 --> 00:14:17.158 undergoing cancer treatment,

NOTE Confidence: 0.935122191111111

00:14:17.160 --> 00:14:19.380 as it's been shown to positively

NOTE Confidence: 0.935122191111111

00:14:19.380 --> 00:14:20.860 impact response to treatments

NOTE Confidence: 0.935122191111111

00:14:20.925 --> 00:14:23.135 decrease the likelihood that patients

NOTE Confidence: 0.935122191111111

00:14:23.135 --> 00:14:24.903 will develop second malignancies

NOTE Confidence: 0.935122191111111

00:14:24.903 --> 00:14:27.019 and increase rates of survival.

NOTE Confidence: 0.935122191111111

00:14:27.020 --> 00:14:28.892 Tobacco treatment programs are

NOTE Confidence: 0.935122191111111

00:14:28.892 --> 00:14:31.232 currently being offered at federally

NOTE Confidence: 0.935122191111111

00:14:31.232 --> 00:14:32.521 designated Comprehensive cancer

NOTE Confidence: 0.935122191111111

00:14:32.521 --> 00:14:34.789 centers such as Yale Cancer Center

NOTE Confidence: 0.935122191111111

00:14:34.789 --> 00:14:36.869 and Smilow Cancer Hospital.

NOTE Confidence: 0.935122191111111

00:14:36.870 --> 00:14:38.534 All treatment components are

NOTE Confidence: 0.935122191111111

00:14:38.534 --> 00:14:40.614 evidence based and patients are

NOTE Confidence: 0.935122191111111

00:14:40.614 --> 00:14:42.541 treated with FDA approved first

NOTE Confidence: 0.935122191111111

00:14:42.541 --> 00:14:44.346 line medications as well as

NOTE Confidence: 0.935122191111111

00:14:44.346 --> 00:14:46.372 smoking cessation counseling that

NOTE Confidence: 0.935122191111111

00:14:46.372 --> 00:14:48.504 stresses appropriate coping skills.

NOTE Confidence: 0.935122191111111

00:14:48.510 --> 00:14:51.510 More information is available at

NOTE Confidence: 0.935122191111111

00:14:51.510 --> 00:14:52.812 yalecancercenter.org. You're listening

NOTE Confidence: 0.935122191111111

00:14:52.812 --> 00:14:54.548 to Connecticut Public Radio.

NOTE Confidence: 0.8814205

00:14:55.900 --> 00:14:58.378 Welcome back to Yale Cancer Answers.

NOTE Confidence: 0.8814205

00:14:58.380 --> 00:15:00.431 This is doctor Anees Chagpar and I'm

NOTE Confidence: 0.8814205

00:15:00.431 --> 00:15:02.780 joined tonight by my guests doctor Amy

NOTE Confidence: 0.8814205

00:15:02.780 --> 00:15:04.905 Justice and Doctor Vin Lo Rey.

NOTE Confidence: 0.8814205

00:15:04.910 --> 00:15:07.878 We are learning about liver toxic medications

NOTE Confidence: 0.8814205

00:15:07.878 --> 00:15:11.197 and the risk of developing liver cancer.

NOTE Confidence: 0.8814205

00:15:11.200 --> 00:15:13.727 So then right before the break we

NOTE Confidence: 0.8814205

00:15:13.727 --> 00:15:16.019 were starting to talk about some

NOTE Confidence: 0.8814205

00:15:16.019 --> 00:15:18.275 of the medications that are toxic

NOTE Confidence: 0.8814205

00:15:18.275 --> 00:15:20.808 to the liver and we talked about

NOTE Confidence: 0.8814205

00:15:20.808 --> 00:15:23.368 the one that's the most ubiquitous,

NOTE Confidence: 0.8814205

00:15:23.368 --> 00:15:25.120 which is alcohol,

NOTE Confidence: 0.8814205

00:15:25.120 --> 00:15:26.430 but talk a little bit.

NOTE Confidence: 0.8814205

00:15:26.430 --> 00:15:28.735 About medications that you found

NOTE Confidence: 0.8814205

00:15:28.735 --> 00:15:32.411 are toxic to the liver and and how

NOTE Confidence: 0.8814205

00:15:32.411 --> 00:15:34.696 that impacts on liver cancer.

NOTE Confidence: 0.862596923

00:15:35.390 --> 00:15:36.750 Yeah, so you know,

NOTE Confidence: 0.862596923

00:15:36.750 --> 00:15:38.790 we recognized that in this setting,

NOTE Confidence: 0.862596923

00:15:38.790 --> 00:15:42.330 particularly of people with HIV,

NOTE Confidence: 0.862596923

00:15:42.330 --> 00:15:44.920 Amy and I early on had recognized

NOTE Confidence: 0.862596923

00:15:44.920 --> 00:15:48.346 that polypharmacy was quite common.

NOTE Confidence: 0.862596923

00:15:48.346 --> 00:15:51.402 Polypharmacy is defined as

NOTE Confidence: 0.862596923

00:15:51.402 --> 00:15:55.042 using five or more medications

NOTE Confidence: 0.862596923

00:15:55.042 --> 00:15:57.914 outside of antiretroviral drugs.

NOTE Confidence: 0.862596923

00:15:57.920 --> 00:16:02.024 And how these multiple other medications

00:16:02.024 --> 00:16:04.760 that patients are prescribed,

00:16:04.760 --> 00:16:07.670 how they may impact on?

00:16:07.670 --> 00:16:09.850 Multiple different organ systems.

00:16:09.850 --> 00:16:13.690 In particularly my interest in the liver.

00:16:13.690 --> 00:16:15.555 You know, was something that

00:16:15.555 --> 00:16:17.420 we really were focused on.

00:16:17.420 --> 00:16:19.530 I think when we embarked

00:16:19.530 --> 00:16:21.218 on studying liver cancer,

00:16:21.220 --> 00:16:23.158 particularly in HIV,

00:16:23.158 --> 00:16:27.680 we were interested in in exploring how

00:16:27.795 --> 00:16:31.630 liver toxic medications might cause

00:16:31.630 --> 00:16:34.690 either acute or chronic inflammation that

00:16:34.690 --> 00:16:38.029 could exacerbate the risk of liver cancer.

00:16:38.030 --> 00:16:42.932 And when we try to specifically

00:16:42.932 --> 00:16:44.566 consider different.

NOTE Confidence: 0.862596923

00:16:44.570 --> 00:16:46.142 Liver toxic drugs.

NOTE Confidence: 0.862596923

00:16:46.142 --> 00:16:48.238 The classifications that really

NOTE Confidence: 0.862596923

00:16:48.238 --> 00:16:50.750 existed were only based on

NOTE Confidence: 0.862596923

00:16:50.750 --> 00:16:52.895 case studies and case reports,

NOTE Confidence: 0.862596923

00:16:52.900 --> 00:16:55.348 and in fact the the National

NOTE Confidence: 0.862596923

00:16:55.348 --> 00:16:57.849 Institutes of Health has a liver

NOTE Confidence: 0.862596923

00:16:57.849 --> 00:17:00.207 tox website that assembles all of

NOTE Confidence: 0.862596923

00:17:00.207 --> 00:17:02.688 the drugs with known hepatoxic,

NOTE Confidence: 0.862596923

00:17:02.690 --> 00:17:05.756 either reports or or case series,

NOTE Confidence: 0.862596923

00:17:05.760 --> 00:17:08.172 but no one has ever tried

NOTE Confidence: 0.862596923

00:17:08.172 --> 00:17:10.536 to group those drugs.

NOTE Confidence: 0.862596923

00:17:10.536 --> 00:17:14.448 Based on the likelihood of developing.

NOTE Confidence: 0.862596923

00:17:14.450 --> 00:17:17.170 Liver injury or for that for that matter.

NOTE Confidence: 0.862596923

00:17:17.170 --> 00:17:21.377 Liver cancer based on real world data

NOTE Confidence: 0.862596923

00:17:21.377 --> 00:17:25.610 outside of just reports and so you know what?

NOTE Confidence: 0.862596923

00:17:25.610 --> 00:17:29.210 What Amy and I wanted to do was to

NOTE Confidence: 0.862596923

00:17:29.210 --> 00:17:32.452 utilize these existing categorizations of

NOTE Confidence: 0.862596923

00:17:32.452 --> 00:17:36.568 apati toxic potential based on reports

NOTE Confidence: 0.862596923

00:17:36.570 --> 00:17:39.952 and actually create real-world cohorts

NOTE Confidence: 0.862596923

00:17:39.952 --> 00:17:44.956 of new initiators of these drugs.

NOTE Confidence: 0.862596923

00:17:44.960 --> 00:17:47.260 From the standpoint of trying

NOTE Confidence: 0.862596923

00:17:47.260 --> 00:17:49.560 to determine which had high

NOTE Confidence: 0.862596923

00:17:49.645 --> 00:17:52.309 versus low rates of liver injury,

NOTE Confidence: 0.862596923

00:17:52.310 --> 00:17:55.138 you see when you're using case reports,

NOTE Confidence: 0.862596923

00:17:55.140 --> 00:17:58.410 you're ignoring the the denominator

NOTE Confidence: 0.862596923

00:17:58.410 --> 00:18:01.060 data of of sort of the the.

NOTE Confidence: 0.862596923

00:18:01.060 --> 00:18:03.818 The world of people who who are

NOTE Confidence: 0.862596923

00:18:03.818 --> 00:18:05.540 actually using these drugs.

NOTE Confidence: 0.862596923

00:18:05.540 --> 00:18:07.151 They're merely cases.

NOTE Confidence: 0.862596923

00:18:07.151 --> 00:18:11.530 But if you have many users but just

NOTE Confidence: 0.862596923

00:18:11.530 --> 00:18:15.028 very few cases, the rates of those.

NOTE Confidence: 0.862596923

00:18:15.028 --> 00:18:17.950 Liver injury events is actually low,

NOTE Confidence: 0.862596923

00:18:17.950 --> 00:18:22.387 So what Amy and I did was to identify

NOTE Confidence: 0.862596923

00:18:22.390 --> 00:18:25.990 195 of the most hepatotoxic drugs

NOTE Confidence: 0.862596923

00:18:25.990 --> 00:18:28.636 based on those that had at least

NOTE Confidence: 0.862596923

00:18:28.636 --> 00:18:31.306 four or more reports of liver

NOTE Confidence: 0.862596923

00:18:31.306 --> 00:18:33.178 injury in the medical literature.

NOTE Confidence: 0.862596923

00:18:33.178 --> 00:18:35.088 Going back from the 1950s,

NOTE Confidence: 0.862596923

00:18:35.088 --> 00:18:38.714 and we used the national VA data

NOTE Confidence: 0.862596923

00:18:38.714 --> 00:18:41.851 to create new user cohorts of

NOTE Confidence: 0.862596923

00:18:41.851 --> 00:18:44.330 each of these 195 drugs.

NOTE Confidence: 0.862596923

00:18:44.330 --> 00:18:47.760 And we followed over a years time.

NOTE Confidence: 0.862596923

00:18:47.760 --> 00:18:50.020 The rate of liver injury,

NOTE Confidence: 0.862596923

00:18:50.020 --> 00:18:53.100 which we classified as severe.

NOTE Confidence: 0.862596923

00:18:53.100 --> 00:18:57.916 Based on you know serious liver dysfunction.

NOTE Confidence: 0.862596923

00:18:57.920 --> 00:19:01.532 And and using that approach we were

NOTE Confidence: 0.862596923

00:19:01.532 --> 00:19:05.695 able to create a new hierarchy or

NOTE Confidence: 0.862596923

00:19:05.695 --> 00:19:09.968 tiers of drugs that can cause liver

NOTE Confidence: 0.862596923

00:19:09.968 --> 00:19:13.359 injury and what we found was 39 of

NOTE Confidence: 0.862596923

00:19:13.359 --> 00:19:17.495 those drugs out of the 195 were had

NOTE Confidence: 0.862596923

00:19:17.495 --> 00:19:23.020 rates that were fairly high for liver injury.

NOTE Confidence: 0.862596923

00:19:23.020 --> 00:19:23.888 And interestingly,

NOTE Confidence: 0.862596923

00:19:23.888 --> 00:19:26.492 the majority of almost half of

NOTE Confidence: 0.862596923

00:19:26.492 --> 00:19:28.809 those jugs were antimicrobial.

NOTE Confidence: 0.862596923

00:19:28.810 --> 00:19:32.570 Drugs so antibiotics, antivirals,

NOTE Confidence: 0.862596923

00:19:32.570 --> 00:19:33.510 antifungals.

NOTE Confidence: 0.862596923

00:19:33.510 --> 00:19:36.072 And our approach to using these

NOTE Confidence: 0.862596923

00:19:36.072 --> 00:19:38.696 from a real world data standpoint

NOTE Confidence: 0.862596923

00:19:38.696 --> 00:19:41.976 was now that we have a group of

NOTE Confidence: 0.862596923

00:19:42.068 --> 00:19:44.394 drugs that we know are associated

NOTE Confidence: 0.862596923

00:19:44.394 --> 00:19:46.656 with higher rates of liver injury.

NOTE Confidence: 0.862596923

00:19:46.660 --> 00:19:49.990 We can now explore those in in terms of

NOTE Confidence: 0.862596923

00:19:49.990 --> 00:19:53.076 their risk of developing liver cancer,

NOTE Confidence: 0.862596923

00:19:53.080 --> 00:19:57.358 and these might be drugs that

NOTE Confidence: 0.862596923

00:19:57.358 --> 00:19:59.497 could be evaluated

NOTE Confidence: 0.826193250625

00:19:59.500 --> 00:20:02.710 for for safety signals in many

NOTE Confidence: 0.826193250625

00:20:02.710 --> 00:20:04.850 different integrated delivery systems

NOTE Confidence: 0.826193250625

00:20:04.928 --> 00:20:07.208 like the VA you could create.

NOTE Confidence: 0.826193250625

00:20:07.210 --> 00:20:10.295 Electronic alerts to warn health

NOTE Confidence: 0.826193250625

00:20:10.295 --> 00:20:13.380 care providers to monitor patients

NOTE Confidence: 0.826193250625

00:20:13.472 --> 00:20:16.047 more closely on these drugs,

NOTE Confidence: 0.826193250625

00:20:16.050 --> 00:20:17.850 and I think future studies to

NOTE Confidence: 0.826193250625

00:20:17.850 --> 00:20:19.408 look at combinations of these

NOTE Confidence: 0.826193250625

00:20:19.408 --> 00:20:21.178 drugs and their risk of liver

NOTE Confidence: 0.826193250625

00:20:21.178 --> 00:20:22.799 injury will also be valuable.

NOTE Confidence: 0.87709890375

00:20:23.490 --> 00:20:26.466 So Amy, let me ask you a question.

NOTE Confidence: 0.87709890375

00:20:26.470 --> 00:20:28.550 I mean, you just that.

NOTE Confidence: 0.87709890375

00:20:28.550 --> 00:20:31.135 That explanation by VIN was

NOTE Confidence: 0.87709890375

00:20:31.135 --> 00:20:32.169 certainly enlightening,

NOTE Confidence: 0.87709890375

00:20:32.170 --> 00:20:35.362 but a lot of people you

NOTE Confidence: 0.87709890375

00:20:35.362 --> 00:20:36.958 know take antibiotics.

NOTE Confidence: 0.87709890375

00:20:36.960 --> 00:20:38.920 They might have, you know,

NOTE Confidence: 0.87709890375

00:20:38.920 --> 00:20:41.146 a touch of pneumonia or a urinary

NOTE Confidence: 0.87709890375

00:20:41.146 --> 00:20:43.212 tract infection and they they take

NOTE Confidence: 0.87709890375

00:20:43.212 --> 00:20:44.952 their week of antibiotics and

NOTE Confidence: 0.87709890375

00:20:44.952 --> 00:20:46.740 their doctors always tell them.

NOTE Confidence: 0.87709890375

00:20:46.740 --> 00:20:48.340 Make sure you finish the

NOTE Confidence: 0.87709890375

00:20:48.340 --> 00:20:50.348 whole week because we don't

NOTE Confidence: 0.87709890375

00:20:50.348 --> 00:20:52.250 want resistance to occur.

NOTE Confidence: 0.874710168333333

00:20:55.140 --> 00:20:57.468 Did you find a dose response?

NOTE Confidence: 0.874710168333333

00:20:57.470 --> 00:20:59.246 Like if you take, you know,

NOTE Confidence: 0.874710168333333

00:20:59.250 --> 00:21:02.742 a course of antibiotics once in

NOTE Confidence: 0.874710168333333

00:21:02.742 --> 00:21:05.023 your lifetime, does that really

31

NOTE Confidence: 0.874710168333333

00:21:05.023 --> 00:21:07.249 increase your risk of liver injury

NOTE Confidence: 0.874710168333333

00:21:07.249 --> 00:21:09.850 and liver cancer over that lifetime?

NOTE Confidence: 0.874710168333333

00:21:09.850 --> 00:21:12.642 Or is it more the people who are

NOTE Confidence: 0.874710168333333

00:21:12.642 --> 00:21:14.709 taking antibiotics on a regular basis?

NOTE Confidence: 0.874710168333333

00:21:14.710 --> 00:21:17.740 That really increases the risk.

NOTE Confidence: 0.878158602222222

00:21:18.690 --> 00:21:20.755 Well, certainly regular exposure would

NOTE Confidence: 0.878158602222222

00:21:20.755 --> 00:21:24.386 be the bigger concern, but in terms of.

NOTE Confidence: 0.878158602222222

00:21:24.386 --> 00:21:27.917 Trying to conduct this research in a

NOTE Confidence: 0.878158602222222

00:21:27.917 --> 00:21:30.280 fairly clear way, we needed to start

NOTE Confidence: 0.878158602222222

00:21:30.280 --> 00:21:32.120 with people who had not been exposed

NOTE Confidence: 0.878158602222222

00:21:32.120 --> 00:21:33.998 and then look at initial exposure,

NOTE Confidence: 0.878158602222222

00:21:34.000 --> 00:21:36.004 since that's one of the highest

NOTE Confidence: 0.878158602222222

00:21:36.004 --> 00:21:37.674 risk periods for injury, right?

NOTE Confidence: 0.878158602222222

00:21:37.674 --> 00:21:39.678 People who have very serious injury

NOTE Confidence: 0.878158602222222

00:21:39.678 --> 00:21:41.959 are going to stop the medication.

NOTE Confidence: 0.878158602222222

00:21:41.960 --> 00:21:43.465 Now that we have identified

NOTE Confidence: 0.878158602222222

00:21:43.465 --> 00:21:45.440 which ones have the most signal,

NOTE Confidence: 0.878158602222222

00:21:45.440 --> 00:21:47.519 we want to go on and look at OK.

NOTE Confidence: 0.878158602222222

00:21:47.520 --> 00:21:50.859 If people actually do have chronic exposure

NOTE Confidence: 0.878158602222222

00:21:50.860 --> 00:21:53.980 and a more low level signal for injury,

NOTE Confidence: 0.878158602222222

00:21:53.980 --> 00:21:55.840 do we see cumulative effects?

NOTE Confidence: 0.878158602222222

00:21:55.840 --> 00:21:57.800 So you make an excellent point in each,

NOTE Confidence: 0.878158602222222

00:21:57.800 --> 00:22:00.064 but the initial study really had to look

NOTE Confidence: 0.878158602222222

00:22:00.064 --> 00:22:02.159 at people who had not been previously

NOTE Confidence: 0.878158602222222

00:22:02.159 --> 00:22:04.540 exposed and then look at acute exposure.

NOTE Confidence: 0.878158602222222

00:22:04.540 --> 00:22:05.030 Yeah,

NOTE Confidence: 0.907813171

00:22:05.480 --> 00:22:08.420 and so then you mentioned that the

NOTE Confidence: 0.907813171

00:22:08.420 --> 00:22:11.936 majority of these 39 top offenders.

NOTE Confidence: 0.907813171

00:22:11.936 --> 00:22:17.200 Were in the antimicrobial kind of spectrum.

NOTE Confidence: 0.907813171

00:22:17.200 --> 00:22:19.936 One of the drugs that a lot of people

NOTE Confidence: 0.907813171

00:22:19.936 --> 00:22:22.790 know about use a lot and and we all kind

NOTE Confidence: 0.907813171

00:22:22.790 --> 00:22:25.814 of think about in terms of liver injury.

NOTE Confidence: 0.907813171

00:22:25.820 --> 00:22:29.260 Is acetaminophen plain old Tylenol?

NOTE Confidence: 0.907813171

00:22:29.260 --> 00:22:32.473 Did you find that that ranked among

NOTE Confidence: 0.907813171

00:22:32.473 --> 00:22:35.664 the highest or or was that in the

NOTE Confidence: 0.907813171

00:22:35.664 --> 00:22:37.956 rest of the the population of drugs?

NOTE Confidence: 0.907813171

00:22:37.956 --> 00:22:40.492 That really was not as toxic as you

NOTE Confidence: 0.907813171

00:22:40.492 --> 00:22:42.268 might have thought to begin with?

NOTE Confidence: 0.830870391818182

00:22:43.090 --> 00:22:45.650 Well, acetaminophen really causes its

NOTE Confidence: 0.830870391818182

00:22:45.650 --> 00:22:48.910 toxicity in a dose dependent fashion,

NOTE Confidence: 0.830870391818182

00:22:48.910 --> 00:22:53.118 so as long as the doses of the

NOTE Confidence: 0.830870391818182

00:22:53.118 --> 00:22:57.130 acetaminophen are not at high at high doses,

NOTE Confidence: 0.830870391818182

00:22:57.130 --> 00:23:00.609 then the the risk is generally low.

NOTE Confidence: 0.830870391818182

00:23:00.610 --> 00:23:04.130 I would say that.

NOTE Confidence: 0.830870391818182

00:23:04.130 --> 00:23:06.150 For those with pre-existing

NOTE Confidence: 0.830870391818182

00:23:06.150 --> 00:23:07.665 chronic liver disease,

NOTE Confidence: 0.830870391818182

00:23:07.670 --> 00:23:10.270 lower doses of acetaminophen

NOTE Confidence: 0.830870391818182

00:23:10.270 --> 00:23:13.520 is is more advantageous because

NOTE Confidence: 0.830870391818182

00:23:13.520 --> 00:23:16.726 with compromised livers the risk

NOTE Confidence: 0.830870391818182

00:23:16.726 --> 00:23:19.758 of liver injury is much higher.

NOTE Confidence: 0.744011525714286

00:23:21.180 --> 00:23:23.357 And and then raises a good point,

NOTE Confidence: 0.744011525714286

00:23:23.360 --> 00:23:25.240 Amy, which is, you know,

NOTE Confidence: 0.744011525714286

00:23:25.240 --> 00:23:27.576 and you had mentioned it before as well,

NOTE Confidence: 0.744011525714286

00:23:27.580 --> 00:23:30.444 is that there is this kind of more

NOTE Confidence: 0.744011525714286

00:23:30.444 --> 00:23:32.999 than one hit to to your liver.

NOTE Confidence: 0.744011525714286

00:23:33.000 --> 00:23:36.051 And so when you did this study and you

NOTE Confidence: 0.744011525714286

00:23:36.051 --> 00:23:39.397 were looking at people who had initiated

NOTE Confidence: 0.744011525714286

00:23:39.397 --> 00:23:41.830 a potentially hepato toxic drug,

NOTE Confidence: 0.744011525714286

00:23:41.830 --> 00:23:44.590 did you kind of stratify these patients by

NOTE Confidence: 0.744011525714286

00:23:44.590 --> 00:23:47.095 other things that might put them at risk?

NOTE Confidence: 0.744011525714286

00:23:47.100 --> 00:23:49.535 Whether that was alcohol use

NOTE Confidence: 0.744011525714286

00:23:49.535 --> 00:23:51.483 or underlying fatty liver?

NOTE Confidence: 0.744011525714286

00:23:51.490 --> 00:23:54.218 Or even happy *******.

NOTE Confidence: 0.936270512857143

00:23:54.730 --> 00:23:58.174 So the answer to that is yes.

NOTE Confidence: 0.936270512857143

00:23:58.180 --> 00:24:00.035 In fact, one of the things that

NOTE Confidence: 0.936270512857143

00:24:00.035 --> 00:24:02.309 seems to be relevant for any number

NOTE Confidence: 0.936270512857143

00:24:02.309 --> 00:24:04.069 of adverse outcomes is simply

NOTE Confidence: 0.936270512857143

00:24:04.069 --> 00:24:06.218 how many medications are you on,

NOTE Confidence: 0.936270512857143

00:24:06.220 --> 00:24:07.775 even after you adjust for

NOTE Confidence: 0.936270512857143

00:24:07.775 --> 00:24:09.019 how sick someone is.

NOTE Confidence: 0.936270512857143

00:24:09.020 --> 00:24:10.760 Physiologically, you know how much

NOTE Confidence: 0.936270512857143

00:24:10.760 --> 00:24:12.885 organ system injury do they appear

NOTE Confidence: 0.936270512857143

00:24:12.885 --> 00:24:14.835 to have based on laboratory data

NOTE Confidence: 0.936270512857143

00:24:14.835 --> 00:24:16.550 and other clinical evaluations.

NOTE Confidence: 0.936270512857143

00:24:16.550 --> 00:24:18.160 Simply counting up how many

NOTE Confidence: 0.936270512857143

00:24:18.160 --> 00:24:19.770 chronic medications they are on,

NOTE Confidence: 0.936270512857143

00:24:19.770 --> 00:24:22.746 especially when they get beyond five or ten,

NOTE Confidence: 0.936270512857143

00:24:22.750 --> 00:24:25.168 has a very strong association with

NOTE Confidence: 0.936270512857143

00:24:25.168 --> 00:24:28.009 any number of adverse health outcomes.

NOTE Confidence: 0.936270512857143

00:24:28.010 --> 00:24:30.701 And that's one of the reasons why Vin was

NOTE Confidence: 0.936270512857143

00:24:30.701 --> 00:24:33.329 talking about polypharmacy a few minutes ago.

NOTE Confidence: 0.936270512857143

00:24:33.330 --> 00:24:35.706 It's very important to interpret exposures

NOTE Confidence: 0.936270512857143

00:24:35.706 --> 00:24:38.080 in the context of how susceptible

NOTE Confidence: 0.936270512857143

00:24:38.080 --> 00:24:40.593 to injury are you at that moment.

NOTE Confidence: 0.936270512857143

00:24:40.600 --> 00:24:42.588 And if you're already on a lot

NOTE Confidence: 0.936270512857143

00:24:42.588 --> 00:24:44.232 of medications and already have

NOTE Confidence: 0.936270512857143

00:24:44.232 --> 00:24:45.700 evidence of liver injury,

NOTE Confidence: 0.936270512857143

00:24:45.700 --> 00:24:47.635 you are highly susceptible to

NOTE Confidence: 0.936270512857143

00:24:47.635 --> 00:24:49.183 injury from another exposure.

NOTE Confidence: 0.81464253375

00:24:49.680 --> 00:24:51.507 But I think in a niche what

NOTE Confidence: 0.81464253375

00:24:51.507 --> 00:24:53.693 you you bring up a good a good

NOTE Confidence: 0.81464253375

00:24:53.693 --> 00:24:56.364 question for this initial analysis,

NOTE Confidence: 0.81464253375

00:24:56.364 --> 00:24:59.369 we chose to specifically exclude

NOTE Confidence: 0.81464253375

00:24:59.369 --> 00:25:02.083 individuals with either viral hepatitis

NOTE Confidence: 0.81464253375

00:25:02.083 --> 00:25:05.980 or other non viral chronic liver diseases,

NOTE Confidence: 0.81464253375

00:25:05.980 --> 00:25:08.570 and even amongst those who

NOTE Confidence: 0.81464253375

00:25:08.570 --> 00:25:10.642 did not have diagnosed.

NOTE Confidence: 0.81464253375

00:25:10.650 --> 00:25:11.718 Chronic liver disease.

NOTE Confidence: 0.81464253375

00:25:11.718 --> 00:25:14.593 We looked in the year prior to their

NOTE Confidence: 0.81464253375

00:25:14.593 --> 00:25:16.798 initiation of the drug to see if

NOTE Confidence: 0.81464253375

00:25:16.798 --> 00:25:19.518 they had any evidence of any liver

NOTE Confidence: 0.81464253375

00:25:19.518 --> 00:25:21.534 aminotransferase abnormalities or any

NOTE Confidence: 0.81464253375

00:25:21.534 --> 00:25:25.987 any end of any evidence of of liver

NOTE Confidence: 0.81464253375

00:25:25.987 --> 00:25:28.922 inflammation and excluded those individuals.

NOTE Confidence: 0.81464253375

00:25:28.930 --> 00:25:31.926 So the the population that we studied,

NOTE Confidence: 0.81464253375

00:25:31.930 --> 00:25:33.090 at least at the outset,

NOTE Confidence: 0.81464253375

00:25:33.090 --> 00:25:36.072 was those who did not have

NOTE Confidence: 0.81464253375

00:25:36.072 --> 00:25:37.563 pre-existing liver disease,

NOTE Confidence: 0.81464253375

00:25:37.570 --> 00:25:39.790 either diagnosed or for that matter,

NOTE Confidence: 0.81464253375

00:25:39.790 --> 00:25:40.891 non diagnosed and.

NOTE Confidence: 0.81464253375

00:25:40.891 --> 00:25:43.460 And it was really when we presented

NOTE Confidence: 0.81464253375

00:25:43.532 --> 00:25:46.792 these results at to the FDA's division

NOTE Confidence: 0.81464253375

00:25:46.792 --> 00:25:49.432 of Hepatology that they really advocated

NOTE Confidence: 0.81464253375

00:25:49.432 --> 00:25:52.747 that we go the extra mile to really

NOTE Confidence: 0.81464253375

00:25:52.747 --> 00:25:55.022 exclude individuals who may have

NOTE Confidence: 0.81464253375

00:25:55.022 --> 00:25:57.509 as yet undiagnosed liver disease.

NOTE Confidence: 0.81464253375

00:25:57.510 --> 00:26:00.057 To ensure that this was an in a group

NOTE Confidence: 0.81464253375

00:26:00.057 --> 00:26:02.698 that wasn't necessarily at higher risk,

NOTE Confidence: 0.81464253375

00:26:02.700 --> 00:26:04.338 such as Amy had mentioned those

NOTE Confidence: 0.81464253375

00:26:04.338 --> 00:26:05.430 with pre-existing liver disease.

NOTE Confidence: 0.856818346666667

00:26:06.220 --> 00:26:08.364 And so I mean all of this work

NOTE Confidence: 0.856818346666667

00:26:08.364 --> 00:26:10.699 is is incredibly interesting,

NOTE Confidence: 0.856818346666667

00:26:10.700 --> 00:26:14.029 but it begs the question and then what?

NOTE Confidence: 0.856818346666667

00:26:14.029 --> 00:26:17.918 So you know, people who are on five or more

NOTE Confidence: 0.856818346666667

00:26:17.918 --> 00:26:20.338 medication certainly are at increased risk,

NOTE Confidence: 0.856818346666667

00:26:20.340 --> 00:26:22.260 but presumably they're on those

NOTE Confidence: 0.856818346666667

00:26:22.260 --> 00:26:23.796 medications because they're needed.

NOTE Confidence: 0.856818346666667

00:26:23.800 --> 00:26:25.108 If they're not needed,

NOTE Confidence: 0.856818346666667

00:26:25.108 --> 00:26:27.448 then the obvious answer to the what

NOTE Confidence: 0.856818346666667

00:26:27.448 --> 00:26:29.960 happens next is you get rid of the

NOTE Confidence: 0.856818346666667

00:26:29.960 --> 00:26:31.577 medications that you don't need.

NOTE Confidence: 0.856818346666667

00:26:31.580 --> 00:26:34.949 But for the people who really do need,

NOTE Confidence: 0.856818346666667

00:26:34.949 --> 00:26:36.881 you know their antihypertensive

NOTE Confidence: 0.856818346666667

00:26:36.881 --> 00:26:38.830 medication and maybe there.

NOTE Confidence: 0.856818346666667

00:26:38.830 --> 00:26:41.470 Their insulin and and their

NOTE Confidence: 0.856818346666667

00:26:41.470 --> 00:26:43.582 statin and whatever else.

NOTE Confidence: 0.856818346666667

00:26:43.590 --> 00:26:45.282 And they're they're on,

NOTE Confidence: 0.856818346666667

00:26:45.282 --> 00:26:46.974 say 5 medications that

NOTE Confidence: 0.856818346666667

00:26:46.974 --> 00:26:48.960 they they truly do need.

NOTE Confidence: 0.856818346666667

00:26:48.960 --> 00:26:51.200 And we know that polypharmacy would put

NOTE Confidence: 0.856818346666667

00:26:51.200 --> 00:26:53.477 you at increased risk of liver disease.

NOTE Confidence: 0.856818346666667

00:26:53.480 --> 00:26:56.576 What should physicians and patients do?

NOTE Confidence: 0.856818346666667

00:26:56.580 --> 00:26:57.272 Amy like?

NOTE Confidence: 0.856818346666667

00:26:57.272 --> 00:26:58.310 What's the answer?

NOTE Confidence: 0.52581927

00:26:59.210 --> 00:27:02.126 Well, so anisha it's you know,

NOTE Confidence: 0.52581927

00:27:02.130 --> 00:27:03.789 in the best of all possible worlds,

NOTE Confidence: 0.52581927

00:27:03.790 --> 00:27:05.908 there would be one Doctor Who's

NOTE Confidence: 0.52581927

00:27:05.908 --> 00:27:08.081 really helping to manage the total

NOTE Confidence: 0.52581927

00:27:08.081 --> 00:27:10.286 picture for the patient in the room.

NOTE Confidence: 0.52581927

00:27:10.286 --> 00:27:12.519 But the reality of our health care system

NOTE Confidence: 0.52581927

00:27:12.519 --> 00:27:14.679 is that that is often not the case.

NOTE Confidence: 0.52581927

00:27:14.680 --> 00:27:17.816 People see a number of different specialists.

NOTE Confidence: 0.52581927

00:27:17.820 --> 00:27:20.095 And each of those specialists looks at

NOTE Confidence: 0.52581927

00:27:20.095 --> 00:27:22.315 the patient and their list of medications

NOTE Confidence: 0.52581927

00:27:22.315 --> 00:27:24.610 only with a view to the particular

NOTE Confidence: 0.52581927

00:27:24.610 --> 00:27:26.920 organ system that they're treating.

NOTE Confidence: 0.52581927

00:27:26.920 --> 00:27:29.422 Further, the guidelines for how we

NOTE Confidence: 0.52581927

00:27:29.422 --> 00:27:31.532 recommend managing people with various

NOTE Confidence: 0.52581927

00:27:31.532 --> 00:27:33.764 diseases in our country have been

NOTE Confidence: 0.52581927

00:27:33.764 --> 00:27:35.812 developed with a similar neurofocus.

NOTE Confidence: 0.52581927

00:27:35.812 --> 00:27:37.048 As a result,

NOTE Confidence: 0.52581927

00:27:37.048 --> 00:27:41.209 people end up being on a lot of medications,

NOTE Confidence: 0.52581927

00:27:41.210 --> 00:27:43.472 sometimes without each of the physicians

NOTE Confidence: 0.52581927

00:27:43.472 --> 00:27:46.001 being totally aware of all the other

NOTE Confidence: 0.52581927

00:27:46.001 --> 00:27:47.915 medications that the person is on.

NOTE Confidence: 0.52581927

00:27:47.920 --> 00:27:48.422 And that's.

NOTE Confidence: 0.52581927

00:27:48.422 --> 00:27:49.677 Part of the reason we've

NOTE Confidence: 0.52581927

00:27:49.677 --> 00:27:50.910 gotten into this quandary,

NOTE Confidence: 0.52581927

00:27:50.910 --> 00:27:52.390 so believe it or not,

NOTE Confidence: 0.52581927

00:27:52.390 --> 00:27:54.000 the first step really is a total

NOTE Confidence: 0.52581927

00:27:54.000 --> 00:27:55.871 view of the medication list and

NOTE Confidence: 0.52581927

00:27:55.871 --> 00:27:57.375 decisions about what medications

NOTE Confidence: 0.52581927

00:27:57.375 --> 00:27:59.069 are truly indicated for this

NOTE Confidence: 0.52581927

00:27:59.069 --> 00:28:00.593 person and which ones are not.

NOTE Confidence: 0.863472237733333

00:28:01.340 --> 00:28:03.587 Doctor Amy Justice is the CNH long

NOTE Confidence: 0.863472237733333

00:28:03.587 --> 00:28:05.317 professor of medicine in general

NOTE Confidence: 0.863472237733333

00:28:05.317 --> 00:28:07.067 medicine and professor of public

NOTE Confidence: 0.863472237733333

00:28:07.067 --> 00:28:09.373 health and health policy at the Yale

NOTE Confidence: 0.863472237733333

00:28:09.373 --> 00:28:11.161 School of Medicine and Doctor Van

NOTE Confidence: 0.863472237733333

00:28:11.170 --> 00:28:13.140 Lowrey is an associate professor

NOTE Confidence: 0.863472237733333

00:28:13.140 --> 00:28:15.110 of medicine and epidemiology at

NOTE Confidence: 0.863472237733333

00:28:15.178 --> 00:28:17.090 the University of Pennsylvania.

NOTE Confidence: 0.863472237733333

00:28:17.090 --> 00:28:18.738 If you have questions,

NOTE Confidence: 0.863472237733333

00:28:18.738 --> 00:28:20.798 the addresses cancer answers at

NOTE Confidence: 0.863472237733333

00:28:20.800 --> 00:28:23.380 yale.edu and past editions of the

NOTE Confidence: 0.863472237733333

00:28:23.380 --> 00:28:25.916 program are available in audio and

NOTE Confidence: 0.863472237733333

00:28:25.916 --> 00:28:27.342 written form at yalecancercenter.org.

NOTE Confidence: 0.863472237733333

00:28:27.342 --> 00:28:29.838 We hope you'll join us next week to

NOTE Confidence: 0.863472237733333

00:28:29.838 --> 00:28:31.741 learn more about the fight against

NOTE Confidence: 0.863472237733333

00:28:31.741 --> 00:28:33.630 cancer here on Connecticut Public Radio.

NOTE Confidence: 0.863472237733333

00:28:33.630 --> 00:28:35.712 Funding for Yale Cancer Answers is

NOTE Confidence: 0.863472237733333

00:28:35.712 --> 00:28:37.680 provided by Smilow Cancer Hospital.