WEBVTT

NOTE duration:"00:59:49"

NOTE recognizability:0.866

NOTE language:en-us

NOTE Confidence: 0.791109643333333

 $00:00:00.000 \rightarrow 00:00:03.310$  So it's a pleasure to introduce Jeremy

NOTE Confidence: 0.798762552

00:00:03.440 --> 00:00:05.795 Warner, who actually I first met

NOTE Confidence: 0.798762552

 $00:00:05.795 \rightarrow 00:00:08.348$  this year when when I was chairing

NOTE Confidence: 0.845342642857143

 $00{:}00{:}08{.}360 \dashrightarrow 00{:}00{:}10{.}915$  a panel at ESMO and he was

NOTE Confidence: 0.928525481428571

 $00:00:10.930 \rightarrow 00:00:12.869$  one of the speakers who we invited.

NOTE Confidence: 0.7411608

00:00:14.950 --> 00:00:18.216 Jeremy is the director of the Brown

NOTE Confidence: 0.7411608

 $00{:}00{:}18.216 \dashrightarrow 00{:}00{:}21.378$  Lifespan Center for Cancer Bioinformatics

NOTE Confidence: 0.857374834

 $00:00:21.390 \longrightarrow 00:00:24.410$  and data science and associate professor

NOTE Confidence: 0.857374834

00:00:24.410 --> 00:00:28.798 technically pending I guess, at Ed Brown.

NOTE Confidence: 0.668117082

00:00:29.480 --> 00:00:31.130 His clinical focus is Morgan

NOTE Confidence: 0.668117082

 $00:00:31.130 \longrightarrow 00:00:34.180$  hematology and he received

NOTE Confidence: 0.97649878

00:00:34.190 $\operatorname{-->}$ 00:00:37.270 his medical degree from from Boston

NOTE Confidence: 0.97649878

 $00{:}00{:}37{.}270 \dashrightarrow 00{:}00{:}41{.}309$  University and also in a Masters in

 $00{:}00{:}41.310$  -->  $00{:}00{:}43.210$  Photonics and Electrical and Computer

NOTE Confidence: 0.97649878

00:00:43.210 --> 00:00:44.990 Engineering from UC San Diego.

NOTE Confidence: 0.91951521

 $00{:}00{:}46.280 \dashrightarrow 00{:}00{:}48.260$  In addition to his focus on

NOTE Confidence: 0.91951521

00:00:48.260 --> 00:00:49.680 malignant hematology, Dr.

NOTE Confidence: 0.91951521

 $00{:}00{:}49.680 \dashrightarrow 00{:}00{:}51.320$  Warner is a leading expert in

NOTE Confidence: 0.91951521

 $00{:}00{:}51{.}320 \dashrightarrow 00{:}00{:}52{.}800$  the clinical and translational

NOTE Confidence: 0.91951521

 $00{:}00{:}52.800 \dashrightarrow 00{:}00{:}53.910$  clinical and translational

NOTE Confidence: 0.91951521

00:00:53.910 --> 00:00:55.570 cancer informatics research,

NOTE Confidence: 0.908135898

00:00:56.160 --> 00:00:58.040 including high dimensional data

NOTE Confidence: 0.908135898

 $00:00:58.040 \rightarrow 00:00:59.460$  analysis and visualization,

NOTE Confidence: 0.908135898

00:00:59.460 --> 00:01:01.032 natural language processing

NOTE Confidence: 0.908135898

00:01:01.032 --> 00:01:02.960 of narrative oncology texts,

NOTE Confidence: 0.908135898

 $00:01:02.960 \longrightarrow 00:01:03.828$  and the creation and

NOTE Confidence: 0.958742508

 $00:01:03.840 \longrightarrow 00:01:07.680$  implementation of health data standards.

NOTE Confidence: 0.958742508

00:01:07.680 --> 00:01:11.840 Before coming to Brown.

NOTE Confidence: 0.958742508

00:01:11.840 --> 00:01:13.728 Jeremy was at Vanderbilt

- NOTE Confidence: 0.93045476
- 00:01:13.740 --> 00:01:15.516 University Medical Center,
- NOTE Confidence: 0.93045476
- $00{:}01{:}15{.}516 \dashrightarrow 00{:}01{:}18{.}090$  where he was an associate professor of
- NOTE Confidence: 0.93045476
- $00:01:18.090 \rightarrow 00:01:21.730$  medicine and biomedical informatics.
- NOTE Confidence: 0.93045476
- 00:01:21.730 --> 00:01:24.425 And I should also note that he
- NOTE Confidence: 0.93045476
- $00:01:24.425 \rightarrow 00:01:27.159$  is the deputy director of Escos
- NOTE Confidence: 0.93045476
- $00{:}01{:}27.160 \dashrightarrow 00{:}01{:}28.959$ Clinical Cancer Informatics Journal
- NOTE Confidence: 0.93045476
- $00:01:28.959 \dashrightarrow 00:01:31.328$  and a founding director of the New
- NOTE Confidence: 0.93045476
- 00:01:31.328 --> 00:01:34.870 Brown University Center for Cancer
- NOTE Confidence: 0.93045476
- $00{:}01{:}34.870 \dashrightarrow 00{:}01{:}36.815$  Bioinformatics and Data Science.
- NOTE Confidence: 0.93045476
- $00:01:36.815 \longrightarrow 00:01:37.990$  So without further
- NOTE Confidence: 0.842243421428572
- 00:01:38.000 --> 00:01:40.338 ado, you're going to speak to us
- NOTE Confidence: 0.894348995
- $00:01:40.350 \rightarrow 00:01:42.258$  about using and improving real world.
- NOTE Confidence: 0.894348995
- $00:01:42.260 \rightarrow 00:01:45.440$  Hey there. Ecosystem in cancer.
- NOTE Confidence: 0.894348995
- $00{:}01{:}45{.}440 \dashrightarrow 00{:}01{:}48{.}710$  Thanks. Look forward to it.
- NOTE Confidence: 0.930034288888889
- 00:01:48.710 --> 00:01:51.203 Thank you. Thank you so much for having me.
- NOTE Confidence: 0.930034288888889

 $00:01:51.210 \longrightarrow 00:01:52.230$  And if anybody wants to

NOTE Confidence: 0.930034288888889

 $00:01:52.230 \longrightarrow 00:01:53.046$  come up to Providence,

NOTE Confidence: 0.930034288888889

00:01:53.050 - 00:01:57.640 just one stop away on the Acela, so.

NOTE Confidence: 0.930034288888889

 $00:01:57.640 \rightarrow 00:02:00.460$  Really nice that we're so close here.

NOTE Confidence: 0.930034288888889

00:02:00.460 - 00:02:03.187 In New England, so I just have a few

NOTE Confidence: 0.930034288888889

 $00{:}02{:}03.187 \dashrightarrow 00{:}02{:}05.266$  disclosures first before I get started.

NOTE Confidence: 0.930034288888889

00:02:05.270 --> 00:02:06.746 So I have some grant funding,

NOTE Confidence: 0.930034288888889

 $00:02:06.750 \longrightarrow 00:02:07.652$  some consulting.

NOTE Confidence: 0.930034288888889

00:02:07.652 --> 00:02:10.584 I do have ownership in hemlock.org LLC,

NOTE Confidence: 0.930034288888889

 $00:02:10.584 \rightarrow 00:02:12.921$  but has no monetary value unless one

NOTE Confidence: 0.930034288888889

 $00{:}02{:}12{.}921 \dashrightarrow 00{:}02{:}15{.}409$  of you wants to be an Angel investor

NOTE Confidence: 0.930034288888889

 $00:02:15.409 \longrightarrow 00:02:18.266$  and we can talk after the presentation.

NOTE Confidence: 0.930034288888889

00:02:18.270 --> 00:02:20.370 So what I'm going to talk

NOTE Confidence: 0.930034288888889

 $00:02:20.370 \rightarrow 00:02:21.978$  about here is you know why,

NOTE Confidence: 0.930034288888889

 $00:02:21.978 \longrightarrow 00:02:24.328$  why do we need real world data and real

NOTE Confidence: 0.930034288888889

 $00:02:24.328 \rightarrow 00:02:26.329$  world evidence in oncology and I'm going

- NOTE Confidence: 0.930034288888889
- $00:02:26.329 \rightarrow 00:02:27.847$  to focus on electronic health records.
- NOTE Confidence: 0.930034288888889
- $00{:}02{:}27.850 \dashrightarrow 00{:}02{:}29.400$  There are other sources of
- NOTE Confidence: 0.930034288888889
- $00:02:29.400 \longrightarrow 00:02:30.950$  real world data of course,
- NOTE Confidence: 0.930034288888889
- 00:02:30.950 --> 00:02:32.749 but you know most of this talk
- NOTE Confidence: 0.930034288888889
- $00:02:32.749 \longrightarrow 00:02:34.108$  will really focus on the ER,
- NOTE Confidence: 0.930034288888889
- $00{:}02{:}34.110 \dashrightarrow 00{:}02{:}34.664$  the HR.
- NOTE Confidence: 0.930034288888889
- $00:02:34.664 \rightarrow 00:02:36.880$  I will spend some time on talking about
- NOTE Confidence: 0.930034288888889
- $00:02:36.941 \longrightarrow 00:02:39.311$  in particular interest in mine which
- NOTE Confidence: 0.930034288888889
- 00:02:39.311 --> 00:02:41.364 is standardizing systemic anti cancer
- NOTE Confidence: 0.930034288888889
- $00:02:41.364 \rightarrow 00:02:43.012$  treatment representations and then
- NOTE Confidence: 0.930034288888889
- $00:02:43.012 \rightarrow 00:02:45.508$  I'll spend some time talking about
- NOTE Confidence: 0.930034288888889
- $00{:}02{:}45{.}508$  -->  $00{:}02{:}48{.}504$  our COVID and COVID-19 and cancer consortium.
- NOTE Confidence: 0.930034288888889
- $00:02:48.510 \longrightarrow 00:02:50.148$  Which is a bit of a culmination,
- NOTE Confidence: 0.930034288888889
- 00:02:50.150 --> 00:02:50.981 if you will,
- NOTE Confidence: 0.930034288888889
- $00:02:50.981 \rightarrow 00:02:52.366$  of some of these thoughts.

- NOTE Confidence: 0.930034288888889
- $00:02:52.370 \rightarrow 00:02:54.687$  So there are some learning objectives here.
- NOTE Confidence: 0.930034288888889
- $00:02:54.690 \rightarrow 00:02:57.366$  If hopefully this is a CME,
- NOTE Confidence: 0.930034288888889
- $00:02:57.370 \longrightarrow 00:02:59.342$  so we'll we'll cover,
- NOTE Confidence: 0.930034288888889
- 00:02:59.342 --> 00:03:00.328 you know,
- NOTE Confidence: 0.930034288888889
- $00{:}03{:}00{.}330 \dashrightarrow 00{:}03{:}01{.}735$  some aspects of natural language
- NOTE Confidence: 0.930034288888889
- $00{:}03{:}01{.}735 \dashrightarrow 00{:}03{:}03{.}675$  processing and how it can be used
- NOTE Confidence: 0.930034288888889
- $00:03:03.675 \rightarrow 00:03:05.127$  to get information out of EHR's,
- NOTE Confidence: 0.930034288888889
- $00:03:05.130 \longrightarrow 00:03:07.885$  why we need formal representations
- NOTE Confidence: 0.930034288888889
- 00:03:07.885 --> 00:03:09.538 for complex concepts.
- NOTE Confidence: 0.930034288888889
- $00:03:09.540 \rightarrow 00:03:11.736$  Such as systemic anti cancer therapy
- NOTE Confidence: 0.930034288888889
- $00:03:11.736 \rightarrow 00:03:14.303$  and then learning about how these these
- NOTE Confidence: 0.930034288888889
- 00:03:14.303 --> 00:03:16.379 ideas went and propelled the COVID,
- NOTE Confidence: 0.930034288888889
- $00{:}03{:}16{.}380 \dashrightarrow 00{:}03{:}19{.}578$  the C19 registry.
- NOTE Confidence: 0.930034288888889
- $00{:}03{:}19.580 \dashrightarrow 00{:}03{:}21.734$  OK, so first of all, you know,
- NOTE Confidence: 0.930034288888889
- $00:03:21.734 \rightarrow 00:03:22.994$  probably everybody might be already
- NOTE Confidence: 0.930034288888889

 $00:03:22.994 \rightarrow 00:03:24.260$  familiar with these definitions,

NOTE Confidence: 0.930034288888889

 $00{:}03{:}24.260 \dashrightarrow 00{:}03{:}26.204$  but I think it's always helpful to go over,

NOTE Confidence: 0.930034288888889

 $00:03:26.210 \rightarrow 00:03:27.946$  you know, what is real world data,

NOTE Confidence: 0.930034288888889

 $00:03:27.950 \longrightarrow 00:03:29.620$  what is real world evidence.

NOTE Confidence: 0.930034288888889

 $00:03:29.620 \dashrightarrow 00:03:32.217$  And you know, it's nebulous a little

NOTE Confidence: 0.930034288888889

00:03:32.217 -> 00:03:34.299 bit and depending on where you,

NOTE Confidence: 0.930034288888889

 $00:03:34.300 \rightarrow 00:03:35.684$  you know, the, the resource you look at,

NOTE Confidence: 0.930034288888889

 $00:03:35.690 \dashrightarrow 00:03:37.460$  you'll get a different definition.

NOTE Confidence: 0.930034288888889

 $00{:}03{:}37{.}460 \dashrightarrow 00{:}03{:}38{.}760$  But this is my definition,

NOTE Confidence: 0.930034288888889

 $00:03:38.760 \rightarrow 00:03:41.250$  which is really based on something

NOTE Confidence: 0.930034288888889

 $00:03:41.250 \rightarrow 00:03:43.660$  called the I kW pyramid.

NOTE Confidence: 0.930034288888889

00:03:43.660 - 00:03:45.580 Has anybody heard about this?

NOTE Confidence: 0.930034288888889

00:03:45.580 --> 00:03:47.056 Heard of the DKW? OK great.

NOTE Confidence: 0.930034288888889

00:03:47.060 --> 00:03:48.726 So teach you a little bit here.

NOTE Confidence: 0.930034288888889

 $00{:}03{:}48.730 \dashrightarrow 00{:}03{:}51.850$  So the idea here is that it's a

NOTE Confidence: 0.930034288888889

00:03:51.850 - 00:03:53.975 pyramid where you're climbing a

- NOTE Confidence: 0.930034288888889
- $00:03:53.980 \longrightarrow 00:03:57.179$  levels here from a base of data.
- NOTE Confidence: 0.930034288888889
- $00:03:57.180 \longrightarrow 00:03:58.640$  The next step is information.
- NOTE Confidence: 0.930034288888889
- $00:03:58.640 \longrightarrow 00:04:00.320$  The next step is knowledge.
- NOTE Confidence: 0.930034288888889
- $00:04:00.320 \longrightarrow 00:04:01.360$  The next step is wisdom.
- NOTE Confidence: 0.930034288888889
- $00:04:01.360 \dashrightarrow 00:04:02.608$  You'll know there's 5 levels here.
- NOTE Confidence: 0.930034288888889
- $00:04:02.610 \longrightarrow 00:04:04.938$  There's a little tiny level at the top
- NOTE Confidence: 0.930034288888889
- $00:04:04.938 \rightarrow 00:04:07.540$  which some people use you for understanding.
- NOTE Confidence: 0.930034288888889
- $00:04:07.540 \longrightarrow 00:04:10.242$  But basically the idea is no matter
- NOTE Confidence: 0.930034288888889
- $00:04:10.242 \longrightarrow 00:04:12.719$  what where the data comes from.
- NOTE Confidence: 0.930034288888889
- $00:04:12.720 \longrightarrow 00:04:13.698$  What it is,
- NOTE Confidence: 0.930034288888889
- $00:04:13.698 \longrightarrow 00:04:15.654$  whether it's from a randomized control
- NOTE Confidence: 0.930034288888889
- 00:04:15.654 --> 00:04:18.524 trial or case control registry,
- NOTE Confidence: 0.930034288888889
- $00{:}04{:}18.524 \dashrightarrow 00{:}04{:}19.160$  etcetera,
- NOTE Confidence: 0.930034288888889
- $00:04:19.160 \longrightarrow 00:04:21.020$  the idea is that as you move up this pyramid,
- NOTE Confidence: 0.930034288888889
- $00:04:21.020 \rightarrow 00:04:22.792$  you're generating real-world evidence,
- NOTE Confidence: 0.930034288888889

 $00:04:22.792 \rightarrow 00:04:26.130$  whereas real world data is really that base.

NOTE Confidence: 0.930034288888889

 $00{:}04{:}26{.}130 \dashrightarrow 00{:}04{:}28{.}188$  On the right here you see the

NOTE Confidence: 0.930034288888889

 $00:04:28.188 \dashrightarrow 00:04:30.167$  the sort of traditional pyramid

NOTE Confidence: 0.930034288888889

 $00:04:30.167 \longrightarrow 00:04:32.727$  of of evidence based medicine.

NOTE Confidence: 0.930034288888889

 $00{:}04{:}32{.}730 \dashrightarrow 00{:}04{:}34{.}522$  So if you look at this from another

NOTE Confidence: 0.930034288888889

 $00:04:34.522 \rightarrow 00:04:36.010$  dimension kind of looking from above,

NOTE Confidence: 0.930034288888889

 $00:04:36.010 \rightarrow 00:04:39.069$  when we think about cancer in particular,

NOTE Confidence: 0.884899444166667

 $00{:}04{:}39{.}070 \dashrightarrow 00{:}04{:}40{.}904$  you know I think about sort of

NOTE Confidence: 0.884899444166667

 $00{:}04{:}40{.}904 \dashrightarrow 00{:}04{:}42{.}290$  three big aspects of cancer,

NOTE Confidence: 0.884899444166667

 $00:04:42.290 \rightarrow 00:04:44.312$  there's the genotype, the phenotype and

NOTE Confidence: 0.884899444166667

 $00{:}04{:}44{.}312 \dashrightarrow 00{:}04{:}46{.}469$  then the environment and sort of for

NOTE Confidence: 0.884899444166667

 $00:04:46.469 \rightarrow 00:04:48.233$  each of these you have these layers.

NOTE Confidence: 0.884899444166667

 $00:04:48.240 \longrightarrow 00:04:49.899$  So, so if you think about the

NOTE Confidence: 0.884899444166667

 $00:04:49.899 \rightarrow 00:04:51.705$  data level for genotype that might

NOTE Confidence: 0.884899444166667

 $00:04:51.705 \rightarrow 00:04:53.425$  that's just the sequence right,

NOTE Confidence: 0.884899444166667

 $00:04:53.430 \longrightarrow 00:04:55.870$  just the somatic tumor sequence.

- NOTE Confidence: 0.884899444166667
- $00:04:55.870 \rightarrow 00:04:56.932$  For phenotype,
- NOTE Confidence: 0.884899444166667
- $00:04:56.932 \longrightarrow 00:05:00.649$  it might be just a histologic type,
- NOTE Confidence: 0.884899444166667
- $00:05:00.650 \rightarrow 00:05:03.149$  a cell, you know what, what is that?
- NOTE Confidence: 0.884899444166667
- $00:05:03.149 \rightarrow 00:05:04.148$  And for environment,
- NOTE Confidence: 0.884899444166667
- $00:05:04.150 \longrightarrow 00:05:05.070$  it might be pollutant levels.
- NOTE Confidence: 0.884899444166667
- $00:05:05.070 \longrightarrow 00:05:06.010$  Now this is data,
- NOTE Confidence: 0.884899444166667
- $00:05:06.010 \rightarrow 00:05:07.910$  but it's not really telling you anything,
- NOTE Confidence: 0.884899444166667
- 00:05:07.910 --> 00:05:08.118 right.
- NOTE Confidence: 0.884899444166667
- $00:05:08.118 \rightarrow 00:05:10.450$  So we need to kind of walk up this pyramid.
- NOTE Confidence: 0.884899444166667
- $00{:}05{:}10.450 \dashrightarrow 00{:}05{:}12.730$  The next level for for these three buckets
- NOTE Confidence: 0.884899444166667
- $00:05:12.730 \rightarrow 00:05:14.978$  would be for genotype and environment.
- NOTE Confidence: 0.884899444166667
- $00{:}05{:}14.980 \dashrightarrow 00{:}05{:}16.610$  You might talk about pathogenicity.
- NOTE Confidence: 0.884899444166667
- $00:05:16.610 \rightarrow 00:05:19.790$  What does that change mean in terms of is it,
- NOTE Confidence: 0.884899444166667
- $00:05:19.790 \longrightarrow 00:05:21.430$  is it a driver mutation?
- NOTE Confidence: 0.884899444166667
- $00{:}05{:}21{.}430 \dashrightarrow 00{:}05{:}24{.}202$  That's sort of the next level information
- NOTE Confidence: 0.884899444166667

 $00:05:24.202 \rightarrow 00:05:26.390$  cancer behavior on the phenotype.

NOTE Confidence: 0.884899444166667

 $00:05:26.390 \longrightarrow 00:05:27.766$  Side so is it,

NOTE Confidence: 0.884899444166667

 $00:05:27.766 \longrightarrow 00:05:28.798$  is it aggressive,

NOTE Confidence: 0.884899444166667

00:05:28.800 --> 00:05:30.696 is it a high grade malignancy

NOTE Confidence: 0.884899444166667

 $00:05:30.696 \longrightarrow 00:05:32.560$  or is it something indolent

NOTE Confidence: 0.884899444166667

 $00:05:32.560 \longrightarrow 00:05:34.820$  kind of stepping up further?

NOTE Confidence: 0.884899444166667

 $00:05:34.820 \rightarrow 00:05:36.236$  For genotype knowledge,

NOTE Confidence: 0.884899444166667

 $00:05:36.236 \rightarrow 00:05:38.596$  the knowledge level is actionability.

NOTE Confidence: 0.884899444166667

 $00{:}05{:}38{.}600 \dashrightarrow 00{:}05{:}41{.}260$  What can you do with this information?

NOTE Confidence: 0.884899444166667

 $00:05:41.260 \rightarrow 00:05:43.619$  Can can you actually prescribe a medication

NOTE Confidence: 0.884899444166667

 $00:05:43.619 \dashrightarrow 00:05:46.149$  that will change the outcome for a patient?

NOTE Confidence: 0.884899444166667

00:05:46.150 --> 00:05:46.412 Phenotype,

NOTE Confidence: 0.884899444166667

 $00{:}05{:}46.412 \dashrightarrow 00{:}05{:}46.674$  same,

NOTE Confidence: 0.884899444166667

00:05:46.674 --> 00:05:47.198 you know,

NOTE Confidence: 0.884899444166667

 $00:05:47.198 \rightarrow 00:05:48.508$  just generally speaking what are

NOTE Confidence: 0.884899444166667

 $00:05:48.508 \dashrightarrow 00:05:50.301$  the treatment options and then the

- NOTE Confidence: 0.884899444166667
- $00:05:50.301 \longrightarrow 00:05:51.781$  environment are there risk modifications
- NOTE Confidence: 0.884899444166667
- 00:05:51.825 -> 00:05:53.253 that can be taken and then really
- NOTE Confidence: 0.884899444166667
- $00:05:53.253 \rightarrow 00:05:55.055$  getting to that top level wisdom,
- NOTE Confidence: 0.884899444166667
- 00:05:55.055 --> 00:05:57.425 you know this is this is
- NOTE Confidence: 0.884899444166667
- $00:05:57.425 \longrightarrow 00:05:59.190$  really complicated now.
- NOTE Confidence: 0.884899444166667
- $00{:}05{:}59{.}190 \dashrightarrow 00{:}06{:}00{.}972$  So in in phenotype you're thinking
- NOTE Confidence: 0.884899444166667
- $00:06:00.972 \dashrightarrow 00:06:02.552$  about what are patient values
- NOTE Confidence: 0.884899444166667
- $00:06:02.552 \rightarrow 00:06:04.556$  and preferences and how do those
- NOTE Confidence: 0.884899444166667
- $00:06:04.556 \rightarrow 00:06:05.951$  influence what treatment options
- NOTE Confidence: 0.884899444166667
- 00:06:05.951 --> 00:06:07.582 you might consider for genotype,
- NOTE Confidence: 0.884899444166667
- $00:06:07.582 \rightarrow 00:06:09.724$  what's the tumor going to do once
- NOTE Confidence: 0.884899444166667
- $00:06:09.724 \rightarrow 00:06:11.747$  it gets exposed to treatments,
- NOTE Confidence: 0.884899444166667
- $00:06:11.750 \longrightarrow 00:06:13.311$  how is it going to evolve under
- NOTE Confidence: 0.884899444166667
- $00:06:13.311 \rightarrow 00:06:14.584$  treatment pressure and an environment
- NOTE Confidence: 0.884899444166667
- $00:06:14.584 \rightarrow 00:06:16.258$  you've got issues about social justice.
- NOTE Confidence: 0.884899444166667

 $00{:}06{:}16{.}260 \dashrightarrow 00{:}06{:}16{.}989$  And structural racism.

NOTE Confidence: 0.884899444166667

00:06:16.989 --> 00:06:18.690 So those are all kind of like.

NOTE Confidence: 0.884899444166667

 $00:06:18.690 \rightarrow 00:06:20.629$  The ideas of climbing this pyramid alright,

NOTE Confidence: 0.884899444166667

00:06:20.630 --> 00:06:21.810 hopefully I've convinced you

NOTE Confidence: 0.884899444166667

 $00{:}06{:}21.810 \dashrightarrow 00{:}06{:}23.285$  the difference between data and

NOTE Confidence: 0.884899444166667

 $00{:}06{:}23.285 \dashrightarrow 00{:}06{:}24.570$  evidence as we kind of step up.

NOTE Confidence: 0.884899444166667

 $00:06:24.570 \rightarrow 00:06:27.634$  Now, why do we need this real-world evidence?

NOTE Confidence: 0.884899444166667

00:06:27.640 --> 00:06:30.120 Well, clinical trials are wonderful,

NOTE Confidence: 0.884899444166667

 $00:06:30.120 \rightarrow 00:06:31.832$  but they're also expensive,

NOTE Confidence: 0.884899444166667

 $00:06:31.832 \longrightarrow 00:06:34.545$  slow to conduct, and they don't

NOTE Confidence: 0.884899444166667

 $00:06:34.545 \rightarrow 00:06:36.920$  always represent the full population.

NOTE Confidence: 0.884899444166667

00:06:36.920 --> 00:06:39.612 At risk also trials,

NOTE Confidence: 0.884899444166667

 $00:06:39.612 \rightarrow 00:06:40.958$  prospective trials,

NOTE Confidence: 0.884899444166667

 $00:06:40.960 \rightarrow 00:06:43.852$  collect some but not all potentially

NOTE Confidence: 0.884899444166667

 $00:06:43.852 \rightarrow 00:06:44.816$  pertinent information.

NOTE Confidence: 0.884899444166667

 $00:06:44.820 \longrightarrow 00:06:46.100$  And our space is huge.

- NOTE Confidence: 0.884899444166667
- 00:06:46.100 --> 00:06:46.466 Oncology,
- NOTE Confidence: 0.884899444166667
- $00:06:46.466 \rightarrow 00:06:49.028$  the treatment space and oncology is huge.
- NOTE Confidence: 0.884899444166667
- $00:06:49.030 \longrightarrow 00:06:49.672$  And then lastly,
- NOTE Confidence: 0.884899444166667
- $00:06:49.672 \longrightarrow 00:06:51.492$  I think last but not least is that
- NOTE Confidence: 0.884899444166667
- $00:06:51.492 \rightarrow 00:06:53.124$  we've got this enormous data source,
- NOTE Confidence: 0.884899444166667
- $00:06:53.130 \longrightarrow 00:06:55.776$  which is the electronic medical record.
- NOTE Confidence: 0.884899444166667
- $00:06:55.780 \longrightarrow 00:06:57.026$  So just a few words about each
- NOTE Confidence: 0.884899444166667
- $00:06:57.026 \longrightarrow 00:06:57.560$  of these items.
- NOTE Confidence: 0.884899444166667
- $00{:}06{:}57{.}560 \dashrightarrow 00{:}06{:}58{.}860$  So when you think about
- NOTE Confidence: 0.884899444166667
- 00:06:58.860 --> 00:06:59.640 trials and disparities,
- NOTE Confidence: 0.884899444166667
- $00:06:59.640 \rightarrow 00:07:02.454$  this is a paper we just published
- NOTE Confidence: 0.884899444166667
- $00:07:02.460 \longrightarrow 00:07:05.808$  very recently and this one was
- NOTE Confidence: 0.884899444166667
- $00:07:05.808 \longrightarrow 00:07:06.864$  earlier this year and we just
- NOTE Confidence: 0.884899444166667
- $00{:}07{:}06.864 \dashrightarrow 00{:}07{:}07{.}904$  published another one in Jim
- NOTE Confidence: 0.884899444166667
- $00{:}07{:}07{.}904 \dashrightarrow 00{:}07{:}08{.}939$  Oncology looking at prostate cancer.
- NOTE Confidence: 0.884899444166667

 $00{:}07{:}08{.}940 \dashrightarrow 00{:}07{:}10{.}992$  This one looks at immune checkpoint

NOTE Confidence: 0.884899444166667

00:07:10.992 --> 00:07:12.018 inhibitors across cancers.

NOTE Confidence: 0.884899444166667

 $00:07:12.020 \dashrightarrow 00:07:14.358$  And basically the take home message here

NOTE Confidence: 0.884899444166667

 $00:07:14.360 \rightarrow 00:07:16.075$  is that when you look across Childs,

NOTE Confidence: 0.884899444166667

 $00:07:16.080 \longrightarrow 00:07:19.636$  there is really a lot of disparity

NOTE Confidence: 0.884899444166667

 $00{:}07{:}19.636 \dashrightarrow 00{:}07{:}22.299$  in who enrolls in trials.

NOTE Confidence: 0.884899444166667

 $00:07:22.300 \longrightarrow 00:07:24.556$  And it can be different by cancer type,

NOTE Confidence: 0.915224604285714

 $00:07:24.560 \rightarrow 00:07:26.940$  but it's pretty consistent across the board.

NOTE Confidence: 0.915224604285714

 $00:07:26.940 \rightarrow 00:07:28.760$  And it's not always underrepresentation.

NOTE Confidence: 0.915224604285714

00:07:28.760 --> 00:07:29.908 Sometimes it's over representation,

NOTE Confidence: 0.915224604285714

 $00{:}07{:}29{.}908 \dashrightarrow 00{:}07{:}32{.}220$  as you can see from the bottom row.

NOTE Confidence: 0.915224604285714

 $00:07:32.220 \rightarrow 00:07:35.314$  But you know, essentially the yellow ones,

NOTE Confidence: 0.915224604285714

 $00:07:35.320 \longrightarrow 00:07:40.210$  the yellow circles are intersections of,

NOTE Confidence: 0.915224604285714

 $00:07:40.210 \rightarrow 00:07:43.600$  in this case, gender, age,

NOTE Confidence: 0.915224604285714

 $00:07:43.600 \dashrightarrow 00:07:46.218$  race and ethnicity, and a cancer type

NOTE Confidence: 0.915224604285714

 $00:07:46.218 \rightarrow 00:07:48.640$  where the enrollment is as you'd expect.

- NOTE Confidence: 0.915224604285714
- $00:07:48.640 \longrightarrow 00:07:50.296$  If it's green, it's sort of more than
- NOTE Confidence: 0.915224604285714
- 00:07:50.296 --> 00:07:52.240 you'd expect, and if it's red, it's.
- NOTE Confidence: 0.915224604285714
- $00{:}07{:}52.240 \dashrightarrow 00{:}07{:}53.360$  It's less than you'd expect.
- NOTE Confidence: 0.915224604285714
- $00:07:53.360 \longrightarrow 00:07:55.230$  So. So you know this,
- NOTE Confidence: 0.915224604285714
- $00{:}07{:}55{.}230 \dashrightarrow 00{:}07{:}57{.}270$  this gets that generalizability and there
- NOTE Confidence: 0.915224604285714
- $00:07:57.270 \dashrightarrow 00:07:59.289$  might be statistical ways around this,
- NOTE Confidence: 0.915224604285714
- 00:07:59.290 --> 00:08:03.298 but you know, essentially.
- NOTE Confidence: 0.915224604285714
- $00:08:03.300 \longrightarrow 00:08:05.355$  Our knowledge from clinical trials
- NOTE Confidence: 0.915224604285714
- $00:08:05.355 \dashrightarrow 00:08:08.082$  is primarily coming from younger.
- NOTE Confidence: 0.915224604285714
- $00:08:08.082 \rightarrow 00:08:12.410$  White men, OK, so.
- NOTE Confidence: 0.915224604285714
- $00:08:12.410 \longrightarrow 00:08:14.386$  How about the information that gets left out?
- NOTE Confidence: 0.915224604285714
- $00{:}08{:}14.390 \dashrightarrow 00{:}08{:}16.700$  So this is, this was a mazing.
- NOTE Confidence: 0.915224604285714
- $00:08:16.700 \dashrightarrow 00:08:18.674$  This is the recovery group that
- NOTE Confidence: 0.915224604285714
- $00{:}08{:}18.674 \dashrightarrow 00{:}08{:}20.679$  really geared up during the early
- NOTE Confidence: 0.915224604285714
- $00:08:20.679 \dashrightarrow 00:08:22.863$  days of the COVID pandemic and found,
- NOTE Confidence: 0.915224604285714

00:08:22.870 --> 00:08:23.572 you know,

NOTE Confidence: 0.915224604285714

 $00{:}08{:}23.572 \dashrightarrow 00{:}08{:}25.678$  pragmatic trials that they ran in

NOTE Confidence: 0.915224604285714

00:08:25.678 --> 00:08:28.743 the UK and they found some really

NOTE Confidence: 0.915224604285714

 $00:08:28.743 \rightarrow 00:08:31.028$  important treatment options for COVID.

NOTE Confidence: 0.915224604285714

 $00:08:31.030 \longrightarrow 00:08:32.278$  This is one of their papers.

NOTE Confidence: 0.915224604285714

 $00:08:32.280 \dashrightarrow 00:08:35.388$  This is probably the most impactful look,

NOTE Confidence: 0.915224604285714

 $00:08:35.390 \dashrightarrow 00:08:37.554$  showing that dexame thas one could

NOTE Confidence: 0.915224604285714

 $00:08:37.554 \rightarrow 00:08:40.259$  help hospitalize patients with COVID.

NOTE Confidence: 0.915224604285714

 $00:08:40.260 \rightarrow 00:08:43.148$  And I've excerpted a table from that paper.

NOTE Confidence: 0.860007212

 $00{:}08{:}45{.}270 \dashrightarrow 00{:}08{:}46{.}190$  Take a minute and let.

NOTE Confidence: 0.860007212

 $00:08:46.190 \dashrightarrow 00:08:47.750$  So what's missing from this table?

NOTE Confidence: 0.860007212

 $00{:}08{:}47.750 \dashrightarrow 00{:}08{:}49.731$  So this is a table of previous

NOTE Confidence: 0.860007212

 $00:08:49.731 \longrightarrow 00:08:50.933$  coexisting diseases in the

NOTE Confidence: 0.860007212

 $00:08:50.933 \rightarrow 00:08:52.129$  patients who have COVID.

NOTE Confidence: 0.860007212

 $00:08:52.130 \longrightarrow 00:08:54.658$  Is there something missing?

NOTE Confidence: 0.860007212

 $00:08:54.660 \longrightarrow 00:08:55.659$  From this table.

 $00:08:58.170 \longrightarrow 00:09:02.237$  Something that's the topic of this talk.

NOTE Confidence: 0.867837141428571

00:09:02.240 --> 00:09:03.114 Cancer, right.

NOTE Confidence: 0.867837141428571

 $00:09:03.114 \longrightarrow 00:09:05.736$  There's no cancer in the stable.

NOTE Confidence: 0.867837141428571

 $00:09:05.740 \longrightarrow 00:09:07.426$  They did not collect cancer and

NOTE Confidence: 0.867837141428571

 $00{:}09{:}07{.}426 \dashrightarrow 00{:}09{:}09{.}170$  and or they didn't report it.

NOTE Confidence: 0.867837141428571

 $00:09:09.170 \dashrightarrow 00:09:11.319$  Well, we actually, we actually went and

NOTE Confidence: 0.867837141428571

 $00:09:11.319 \rightarrow 00:09:13.718$  you know got their case report forms,

NOTE Confidence: 0.867837141428571

 $00:09:13.720 \longrightarrow 00:09:14.816$  they didn't record cancer.

NOTE Confidence: 0.867837141428571

 $00{:}09{:}14.816 \dashrightarrow 00{:}09{:}16.830$  So here they enrolled 10s of thousands

NOTE Confidence: 0.867837141428571

 $00:09:16.830 \longrightarrow 00:09:18.410$  of patients in these trials.

NOTE Confidence: 0.867837141428571

 $00:09:18.410 \longrightarrow 00:09:19.970$  And they don't know if these

NOTE Confidence: 0.867837141428571

 $00{:}09{:}19{.}970 \dashrightarrow 00{:}09{:}21{.}270$  patients had cancer or not.

NOTE Confidence: 0.867837141428571

 $00{:}09{:}21{.}270 \dashrightarrow 00{:}09{:}23{.}130$  And so I mean, a mazing work,

NOTE Confidence: 0.867837141428571

 $00:09:23.130 \longrightarrow 00:09:26.834$  but we're missing a key piece of information.

NOTE Confidence: 0.867837141428571

 $00{:}09{:}26.840 \dashrightarrow 00{:}09{:}29.036$  And then sort of the last item you know

 $00:09:29.036 \dashrightarrow 00:09:31.141$  that I met that I mentioned before is

NOTE Confidence: 0.867837141428571

 $00{:}09{:}31{.}141 \dashrightarrow 00{:}09{:}33{.}890$  that this idea that our treatment space

NOTE Confidence: 0.867837141428571

 $00:09:33.890 \longrightarrow 00:09:36.121$  is huge but head-to-head comparisons NOTE Confidence: 0.867837141428571

00:09:36.121 --> 00:09:39.079 of important drugs are mostly absent.

NOTE Confidence: 0.867837141428571

00:09:39.080 --> 00:09:41.075 And I'll just give you one example.

NOTE Confidence: 0.867837141428571

 $00{:}09{:}41.080 \dashrightarrow 00{:}09{:}43.768$  So this is the space of PD1 inhibitors

NOTE Confidence: 0.867837141428571

 $00:09:43.768 \dashrightarrow 00:09:46.341$  which have changed our obviously changed

NOTE Confidence: 0.867837141428571

 $00:09:46.341 \rightarrow 00:09:48.436$  our fields from our hemac knowledge

NOTE Confidence: 0.867837141428571

 $00{:}09{:}48.436 \dashrightarrow 00{:}09{:}50.820$  base which I'll talk about a bit later.

NOTE Confidence: 0.867837141428571

 $00:09:50.820 \dashrightarrow 00:09:54.604$  We have 137 trials that have been published

NOTE Confidence: 0.867837141428571

 $00:09:54.604 \dashrightarrow 00:09:57.246$  using 64 different regimens of of various.

NOTE Confidence: 0.867837141428571

 $00:09:57.250 \longrightarrow 00:09:58.064$  81 inhibitors.

NOTE Confidence: 0.867837141428571

 $00:09:58.064 \rightarrow 00:10:00.506$  This includes XUS by the way.

NOTE Confidence: 0.867837141428571

00:10:00.510 --> 00:10:02.182 If you're like they're not 13 P you

NOTE Confidence: 0.867837141428571

 $00:10:02.182 \rightarrow 00:10:03.830$  want to have actually there are,

NOTE Confidence: 0.867837141428571

 $00:10:03.830 \rightarrow 00:10:06.809$  but many of those are only approved in China.

 $00:10:06.810 \longrightarrow 00:10:10.666$  So 83 of those are phase three trials.

NOTE Confidence: 0.867837141428571

 $00{:}10{:}10{.}670 \dashrightarrow 00{:}10{:}13{.}878$  Take home point is one of those 83

NOTE Confidence: 0.867837141428571

00:10:13.878 --> 00:10:15.825 actually compared to PD1 inhibitor

NOTE Confidence: 0.867837141428571

 $00{:}10{:}15.825 \dashrightarrow 00{:}10{:}18.879$  to a PDL 1 inhibitor kind of it

NOTE Confidence: 0.867837141428571

 $00{:}10{:}18.879 \dashrightarrow 00{:}10{:}21.417$  actually compared to Kobe matanov and

NOTE Confidence: 0.867837141428571

 $00:10:21.417 \rightarrow 00:10:23.437$  at ezolizum ab and that's grand total

NOTE Confidence: 0.867837141428571

 $00:10:23.437 \longrightarrow 00:10:26.144$  of zero of these trials compared 1PD1

NOTE Confidence: 0.867837141428571

 $00:10:26.144 \rightarrow 00:10:28.628$  inhibitor to another PD1 inhibitor so.

NOTE Confidence: 0.867837141428571

00:10:28.630 --> 00:10:29.068 You know,

NOTE Confidence: 0.867837141428571

 $00{:}10{:}29{.}068 \dashrightarrow 00{:}10{:}30{.}601$  maybe I'm missing some trials that are

NOTE Confidence: 0.867837141428571

 $00:10:30.601 \rightarrow 00:10:32.190$  ongoing now that have yet to be published.

NOTE Confidence: 0.867837141428571

 $00{:}10{:}32{.}190 \dashrightarrow 00{:}10{:}34{.}026$  But at this point in time,

NOTE Confidence: 0.867837141428571

 $00{:}10{:}34.030 \dashrightarrow 00{:}10{:}37.225$  we don't have any data at all on whether

NOTE Confidence: 0.867837141428571

 $00{:}10{:}37.230 \dashrightarrow 00{:}10{:}39.702$  1PD1 inhibitor is better than another

NOTE Confidence: 0.867837141428571

 $00{:}10{:}39.702 \dashrightarrow 00{:}10{:}42.162$  except for indirect treatment comparisons,

 $00{:}10{:}42.162 \dashrightarrow 00{:}10{:}42.706$  so.

NOTE Confidence: 0.867837141428571

00:10:42.706 --> 00:10:45.426 Hopefully I've convinced you that.

NOTE Confidence: 0.867837141428571

 $00{:}10{:}45{.}430 \dashrightarrow 00{:}10{:}47{.}180$  We should at least think

NOTE Confidence: 0.867837141428571

 $00:10:47.180 \longrightarrow 00:10:48.580$  about using real-world data.

NOTE Confidence: 0.867837141428571

00:10:48.580 --> 00:10:49.164 But.

NOTE Confidence: 0.867837141428571

 $00:10:49.164 \longrightarrow 00:10:50.916$  They are messy,

NOTE Confidence: 0.867837141428571

 $00:10:50.916 \longrightarrow 00:10:52.668$  ambiguous and unpredictable.

NOTE Confidence: 0.867837141428571

 $00{:}10{:}52.670 \dashrightarrow 00{:}10{:}54.777$  So let me talk about some some

NOTE Confidence: 0.867837141428571

00:10:54.777 $\operatorname{-->}$ 00:10:56.702 challenges that we have once we

NOTE Confidence: 0.867837141428571

 $00{:}10{:}56.702 \dashrightarrow 00{:}10{:}58.622$  start delving into the real world.

NOTE Confidence: 0.867837141428571

 $00:10:58.630 \longrightarrow 00:11:01.250$  So first of all.

NOTE Confidence: 0.867837141428571

 $00{:}11{:}01{.}250 \dashrightarrow 00{:}11{:}04{.}568$  This is real-world data from the Medline.

NOTE Confidence: 0.918139125882353

 $00:11:06.670 \longrightarrow 00:11:07.670$  Institution information.

NOTE Confidence: 0.918139125882353

 $00:11:07.670 \longrightarrow 00:11:12.283$  OK, so did you know that there were 21

NOTE Confidence: 0.918139125882353

 $00:11:12.283 \rightarrow 00:11:15.427$  clinical trial institutions in New Haven?

NOTE Confidence: 0.918139125882353

 $00:11:15.430 \longrightarrow 00:11:16.450$  Did you know that?

00:11:16.450 --> 00:11:19.368 That's amazing, right? Here they are.

NOTE Confidence: 0.918139125882353

00:11:19.368 --> 00:11:22.860 Smilow Cancer Center, Smilow Cancer Hospital,

NOTE Confidence: 0.918139125882353

00:11:22.860 --> 00:11:25.660 smilow cancer hospital at Yale,

NOTE Confidence: 0.918139125882353

00:11:25.660 --> 00:11:27.838 Smilow Cancer Hospital at Yale University,

NOTE Confidence: 0.918139125882353

00:11:27.840 --> 00:11:30.030 Yale Cancer Center.

NOTE Confidence: 0.918139125882353

00:11:30.030 --> 00:11:32.172 Yale Cancer Center and Smilow Cancer

NOTE Confidence: 0.918139125882353

00:11:32.172 --> 00:11:33.412 Hospital, Yale Medical school.

NOTE Confidence: 0.918139125882353

00:11:33.412 --> 00:11:35.838 Alright, I think you get the idea, right?

NOTE Confidence: 0.918139125882353

 $00:11:35.838 \longrightarrow 00:11:38.414$  So I mean this is real world.

NOTE Confidence: 0.918139125882353

00:11:38.420 --> 00:11:39.848 I mean you have to do something.

NOTE Confidence: 0.918139125882353

00:11:39.850 --> 00:11:41.479 I mean, a computer is not going to know,

NOTE Confidence: 0.918139125882353

00:11:41.480 --> 00:11:42.479 right? I mean,

NOTE Confidence: 0.918139125882353

 $00{:}11{:}42.479 \dashrightarrow 00{:}11{:}46.277$  so if you want to use this data in some way,

NOTE Confidence: 0.918139125882353

 $00{:}11{:}46.280 \dashrightarrow 00{:}11{:}47.936$  some one's got to do some work

NOTE Confidence: 0.918139125882353

00:11:47.936 --> 00:11:49.370 to actually fix this, right?

00:11:49.370 --> 00:11:51.680 That is a big part of working

NOTE Confidence: 0.918139125882353

 $00{:}11{:}51{.}680 \dashrightarrow 00{:}11{:}53{.}209$  with real world data.

NOTE Confidence: 0.918139125882353

 $00{:}11{:}53{.}210 \dashrightarrow 00{:}11{:}54{.}610$  Yale New Haven hospital.

NOTE Confidence: 0.918139125882353

 $00:11:54.610 \rightarrow 00:11:57.840$  There's the 21st, OK?

NOTE Confidence: 0.918139125882353

 $00{:}11{:}57{.}840 \dashrightarrow 00{:}11{:}59{.}600$  OK. So how about,

NOTE Confidence: 0.918139125882353

 $00:11:59.600 \rightarrow 00:12:01.920$  so that's bibliometrics to some degree,

NOTE Confidence: 0.918139125882353

 $00:12:01.920 \longrightarrow 00:12:03.000$  how about treatments,

NOTE Confidence: 0.918139125882353

 $00:12:03.000 \longrightarrow 00:12:05.388$  how many tyrosine kinase

NOTE Confidence: 0.918139125882353

 $00:12:05.388 \longrightarrow 00:12:07.179$  inhibitors are there?

NOTE Confidence: 0.918139125882353

 $00{:}12{:}07{.}180 \dashrightarrow 00{:}12{:}10{.}212$  And so this is a little project that

NOTE Confidence: 0.918139125882353

 $00:12:10.212 \rightarrow 00:12:13.170$  a student of mine undertook where they

NOTE Confidence: 0.918139125882353

 $00:12:13.170 \rightarrow 00:12:15.655$  mapped out how many letters you'd have

NOTE Confidence: 0.918139125882353

 $00:12:15.655 \rightarrow 00:12:18.536$  to switch around or basically misspell.

NOTE Confidence: 0.918139125882353

 $00{:}12{:}18.540 \dashrightarrow 00{:}12{:}21.024$  So that one tyrosine kinase inhibitor

NOTE Confidence: 0.918139125882353

 $00:12:21.024 \rightarrow 00:12:23.010$  would actually be another one.

NOTE Confidence: 0.918139125882353

 $00:12:23.010 \longrightarrow 00:12:25.440$  And so it's it's fewer letters

- NOTE Confidence: 0.918139125882353
- $00:12:25.440 \longrightarrow 00:12:27.085$  than you think and.
- NOTE Confidence: 0.918139125882353
- 00:12:27.085 --> 00:12:29.635 You know, these drugs get misspelled
- NOTE Confidence: 0.918139125882353
- 00:12:29.635 --> 00:12:33.550 all the time in a pretty amazing ways.
- NOTE Confidence: 0.918139125882353
- $00:12:33.550 \longrightarrow 00:12:34.410$  I see that the net,
- NOTE Confidence: 0.918139125882353
- $00:12:34.410 \longrightarrow 00:12:35.586$  there's a little bit of formatting
- NOTE Confidence: 0.918139125882353
- $00:12:35.586 \rightarrow 00:12:38.480$  issue with the next slide, but.
- NOTE Confidence: 0.918139125882353
- $00:12:38.480 \longrightarrow 00:12:42.968$  So this this is real data.
- NOTE Confidence: 0.918139125882353
- 00:12:42.970 --> 00:12:45.114 From the Vanderbilt University
- NOTE Confidence: 0.918139125882353
- $00:12:45.114 \longrightarrow 00:12:46.186$  Medical Center.
- NOTE Confidence: 0.918139125882353
- $00{:}12{:}46{.}190 \dashrightarrow 00{:}12{:}49{.}234$  So this is from our text list of medications.
- NOTE Confidence: 0.918139125882353
- 00:12:49.234 --> 00:12:50.824 Now you might say, oh,
- NOTE Confidence: 0.918139125882353
- 00:12:50.824 --> 00:12:51.920 let's just, you know,
- NOTE Confidence: 0.918139125882353
- $00{:}12{:}51{.}920 \dashrightarrow 00{:}12{:}53{.}248$  we've got to be able to get these
- NOTE Confidence: 0.918139125882353
- 00:12:53.248 --> 00:12:54.149 medications from structured data.
- NOTE Confidence: 0.918139125882353
- $00:12:54.150 \longrightarrow 00:12:55.949$  That may or may not be true.
- NOTE Confidence: 0.918139125882353

 $00:12:55.950 \rightarrow 00:12:58.326$  It depends. We can talk more about that.

NOTE Confidence: 0.918139125882353

 $00{:}12{:}58{.}330 \dashrightarrow 00{:}12{:}59{.}600$  But these are real misspellings

NOTE Confidence: 0.918139125882353

 $00{:}12{:}59{.}600 \dashrightarrow 00{:}13{:}01{.}070$  of the drug or Latino BI.

NOTE Confidence: 0.918139125882353

00:13:01.070 --> 00:13:02.834 Think you can tell looking at this

NOTE Confidence: 0.918139125882353

 $00{:}13{:}02{.}834 \dashrightarrow 00{:}13{:}04{.}966$  that all of these are or lot in him.

NOTE Confidence: 0.918139125882353

00:13:04.970 --> 00:13:05.574 But again,

NOTE Confidence: 0.918139125882353

 $00{:}13{:}05{.}574 \dashrightarrow 00{:}13{:}08{.}332$  I mean if you don't have some sort of

NOTE Confidence: 0.918139125882353

 $00:13:08.332 \rightarrow 00:13:12.210$  system to harmonize all those misspellings.

NOTE Confidence: 0.918139125882353

00:13:12.210 --> 00:13:13.440 You're not going to know

NOTE Confidence: 0.918139125882353

 $00:13:13.440 \longrightarrow 00:13:14.670$  which patient got what drug.

NOTE Confidence: 0.918139125882353

 $00{:}13{:}14.670 \dashrightarrow 00{:}13{:}15.058$  So.

NOTE Confidence: 0.918139125882353

 $00{:}13{:}15{.}058 \dashrightarrow 00{:}13{:}17{.}828$  So that's you know, that's a real

NOTE Confidence: 0.918139125882353

 $00{:}13{:}17.828 \dashrightarrow 00{:}13{:}20.264$  world issue with real world data.

NOTE Confidence: 0.918139125882353

 $00:13:20.270 \longrightarrow 00:13:21.999$  This is work that we did some

NOTE Confidence: 0.918139125882353

00:13:21.999 --> 00:13:23.270 years ago on staging,

NOTE Confidence: 0.918139125882353

 $00:13:23.270 \rightarrow 00:13:26.438$  so cancer staging.

- NOTE Confidence: 0.918139125882353
- $00:13:26.440 \rightarrow 00:13:29.807$  Here is what I call manageable ambiguity.
- NOTE Confidence: 0.918139125882353
- 00:13:29.810 --> 00:13:31.530 All right,
- NOTE Confidence: 0.918139125882353
- $00:13:31.530 \longrightarrow 00:13:32.390$  so.
- NOTE Confidence: 0.918139125882353
- 00:13:32.390 --> 00:13:33.824 And again and maybe you
- NOTE Confidence: 0.918139125882353
- $00{:}13{:}33{.}824 \dashrightarrow 00{:}13{:}35{.}136$  know during sort of discussion
- NOTE Confidence: 0.918139125882353
- $00:13:35.136 \longrightarrow 00:13:37.236$  we can talk about the value of
- NOTE Confidence: 0.918139125882353
- 00:13:37.236 --> 00:13:38.809 structured versus unstructured data,
- NOTE Confidence: 0.918139125882353
- $00{:}13{:}38{.}810 \dashrightarrow 00{:}13{:}41{.}402$  but the idea here is that we would
- NOTE Confidence: 0.918139125882353
- $00{:}13{:}41{.}402 \dashrightarrow 00{:}13{:}43{.}646$  take data from progress notes from
- NOTE Confidence: 0.918139125882353
- $00:13:43.646 \longrightarrow 00:13:46.040$  clinical text to all these notes.
- NOTE Confidence: 0.918139125882353
- 00:13:46.040 --> 00:13:48.800 And figure out if a patient had stage
- NOTE Confidence: 0.918139125882353
- 00:13:48.800 --> 00:13:51.075 123 or four. So just forget ABC.
- NOTE Confidence: 0.918139125882353
- $00:13:51.080 \rightarrow 00:13:55.337$  We're just trying to go for the big stages.
- NOTE Confidence: 0.918139125882353
- $00:13:55.340 \longrightarrow 00:13:56.048$  And you know,
- NOTE Confidence: 0.918139125882353
- $00:13:56.048 \rightarrow 00:13:57.700$  the problem that we knew ahead of
- NOTE Confidence: 0.918139125882353

 $00:13:57.755 \rightarrow 00:13:59.512$  time is that these things are going

NOTE Confidence: 0.918139125882353

 $00{:}13{:}59{.}512 \dashrightarrow 00{:}14{:}01{.}294$  to be recorded variably in different

NOTE Confidence: 0.918139125882353

 $00:14:01.294 \rightarrow 00:14:03.238$  notes by different types of doctors.

NOTE Confidence: 0.918139125882353

 $00:14:03.240 \longrightarrow 00:14:05.508$  But you know we did a pilot

NOTE Confidence: 0.918139125882353

 $00:14:05.508 \longrightarrow 00:14:07.439$  with about 1000 patients with

NOTE Confidence: 0.918139125882353

 $00:14:07.439 \longrightarrow 00:14:09.652$  lung cancer with over 460,000

NOTE Confidence: 0.918139125882353

 $00{:}14{:}09.652 \dashrightarrow 00{:}14{:}11.460$  clinical documents across them.

NOTE Confidence: 0.918139125882353

 $00:14:11.460 \rightarrow 00:14:13.950$  Now if you pause for a minute and you think

NOTE Confidence: 0.886603504545454

 $00{:}14{:}14{.}012 \dashrightarrow 00{:}14{:}15{.}188$  about. A chart review.

NOTE Confidence: 0.886603504545454

 $00{:}14{:}15{.}188 \dashrightarrow 00{:}14{:}17{.}650$  Think about how long it would take you to

NOTE Confidence: 0.886603504545454

 $00:14:17.650 \rightarrow 00:14:19.748$  go through 460,000 documents, right so.

NOTE Confidence: 0.886603504545454

00:14:19.748 --> 00:14:21.783 Here's my pitch for natural

NOTE Confidence: 0.886603504545454

 $00:14:21.783 \longrightarrow 00:14:22.950$  language processing.

NOTE Confidence: 0.886603504545454

 $00:14:22.950 \longrightarrow 00:14:25.519$  You can actually automate this kind of

NOTE Confidence: 0.886603504545454

 $00{:}14{:}25{.}519$  -->  $00{:}14{:}30{.}164$  thing and and do this kind of work at scale.

NOTE Confidence: 0.886603504545454

 $00:14:30.170 \longrightarrow 00:14:34.553$  So cutting to the chase a little bit here.

 $00:14:34.560 \longrightarrow 00:14:36.216$  First of all, we found that

NOTE Confidence: 0.886603504545454

00:14:36.216 --> 00:14:37.996 out of those 964 patients,

NOTE Confidence: 0.886603504545454

 $00{:}14{:}37{.}996 \dashrightarrow 00{:}14{:}41{.}307$ 99% had some kind of stage freeze

NOTE Confidence: 0.886603504545454

 $00:14:41.307 \rightarrow 00:14:44.888$  in their note. At least one.

NOTE Confidence: 0.886603504545454

 $00:14:44.890 \longrightarrow 00:14:46.605$  And we also had a gold standard

NOTE Confidence: 0.886603504545454

00:14:46.605 --> 00:14:48.488 which was the tumor registry data.

NOTE Confidence: 0.886603504545454

 $00:14:48.490 \longrightarrow 00:14:50.788$  So we were able to compare

NOTE Confidence: 0.886603504545454

 $00:14:50.788 \longrightarrow 00:14:53.390$  our system to to the subset.

NOTE Confidence: 0.886603504545454

00:14:53.390 --> 00:14:55.550 You'll notice only 790 out of

NOTE Confidence: 0.886603504545454

00:14:55.550 --> 00:14:57.270 those 964 had tumor registry data,

NOTE Confidence: 0.886603504545454

 $00{:}14{:}57{.}270 \dashrightarrow 00{:}15{:}00{.}030$  but we were able to do a comparison and you

NOTE Confidence: 0.886603504545454

 $00{:}15{:}00{.}094 \dashrightarrow 00{:}15{:}02{.}789$  know our system worked really pretty well.

NOTE Confidence: 0.886603504545454

00:15:02.790 --> 00:15:03.682 The green, you know,

NOTE Confidence: 0.886603504545454

 $00{:}15{:}03.682 \dashrightarrow 00{:}15{:}05.320$  basically the matches are in the green,

NOTE Confidence: 0.886603504545454

 $00:15:05.320 \rightarrow 00:15:07.669$  the big numbers and we got some things wrong,

 $00:15:07.670 \rightarrow 00:15:09.524$  but we didn't usually get things

NOTE Confidence: 0.886603504545454

 $00{:}15{:}09{.}524 \dashrightarrow 00{:}15{:}11{.}350$  really wrong most of the time.

NOTE Confidence: 0.886603504545454

 $00:15:11.350 \longrightarrow 00:15:12.346$  So if it was stage one,

NOTE Confidence: 0.886603504545454

 $00:15:12.350 \longrightarrow 00:15:13.442$  we called stage four,

NOTE Confidence: 0.886603504545454

 $00{:}15{:}13.442 \dashrightarrow 00{:}15{:}14.807$  that was a big mistake.

NOTE Confidence: 0.886603504545454

 $00{:}15{:}14.810 \dashrightarrow 00{:}15{:}15.830$  Only happened once.

NOTE Confidence: 0.92679775

00:15:18.610 --> 00:15:22.026 This, this shows actually,

NOTE Confidence: 0.92679775

 $00:15:22.026 \rightarrow 00:15:23.862$  so again 460,000 documents.

NOTE Confidence: 0.92679775

 $00{:}15{:}23.862 \dashrightarrow 00{:}15{:}26.284$  So what we wanted to say is.

NOTE Confidence: 0.92679775

 $00:15:26.290 \rightarrow 00:15:28.082$  And you have to look at all

NOTE Confidence: 0.92679775

 $00:15:28.082 \longrightarrow 00:15:30.241$  of those or can you just look

NOTE Confidence: 0.92679775

 $00:15:30.241 \longrightarrow 00:15:31.886$  at notes that were written?

NOTE Confidence: 0.92679775

 $00{:}15{:}31{.}890 \dashrightarrow 00{:}15{:}33{.}666$  Right after a patient was diagnosed

NOTE Confidence: 0.92679775

00:15:33.666 --> 00:15:35.831 you know with if you think of

NOTE Confidence: 0.92679775

 $00{:}15{:}35{.}831 \dashrightarrow 00{:}15{:}37{.}673$  some of this inspiration for this

NOTE Confidence: 0.92679775

 $00:15:37.673 \rightarrow 00:15:39.294$  project came from the copi measures.

 $00{:}15{:}39{.}294 \dashrightarrow 00{:}15{:}41{.}310$  And if any of you have done that work

NOTE Confidence: 0.92679775

 $00{:}15{:}41{.}361 \dashrightarrow 00{:}15{:}42{.}933$  you'll remember I believe and they

NOTE Confidence: 0.92679775

00:15:42.933 --> 00:15:44.804 may have changed but at one point

NOTE Confidence: 0.92679775

 $00{:}15{:}44{.}804 \dashrightarrow 00{:}15{:}46{.}346$  the coping measure was was stage

NOTE Confidence: 0.92679775

 $00{:}15{:}46{.}346 \dashrightarrow 00{:}15{:}48{.}212$  recorded in one of the first two

NOTE Confidence: 0.92679775

00:15:48.212 --> 00:15:49.850 progress notes written after diagnosis.

NOTE Confidence: 0.92679775

 $00{:}15{:}49.850 \dashrightarrow 00{:}15{:}51.719$  So it kind of makes sense that

NOTE Confidence: 0.92679775

00:15:51.719 $\operatorname{-->}$ 00:15:53.649 you would look for stage early on

NOTE Confidence: 0.92679775

 $00{:}15{:}53.650 \dashrightarrow 00{:}15{:}56.114$  but if you look at this black line

NOTE Confidence: 0.92679775

 $00:15:56.114 \rightarrow 00:15:58.306$  here at the bottom. So does this.

NOTE Confidence: 0.92679775

00:15:58.306 --> 00:15:59.234 Are you seeing my?

NOTE Confidence: 0.92679775

 $00{:}15{:}59{.}240 \dashrightarrow 00{:}16{:}00{.}666$  You don't see the arrow, are you?

NOTE Confidence: 0.92679775

00:16:00.666 --> 00:16:02.705 I don't think you're seeing the error, OK.

NOTE Confidence: 0.92679775

 $00{:}16{:}02.705 \dashrightarrow 00{:}16{:}04.280$  If you look at the black line

NOTE Confidence: 0.92679775

 $00:16:04.280 \longrightarrow 00:16:05.761$  towards the bottom, you'll see that.

 $00:16:05.761 \rightarrow 00:16:07.768$  If you look at the the notes in the

NOTE Confidence: 0.92679775

00:16:07.768 --> 00:16:09.048 first five weeks from diagnosis,

NOTE Confidence: 0.92679775

 $00:16:09.050 \longrightarrow 00:16:10.630$  actually there's a pretty high

NOTE Confidence: 0.92679775

 $00:16:10.630 \longrightarrow 00:16:11.894$  rate of unknown stage.

NOTE Confidence: 0.92679775

 $00{:}16{:}11{.}900 \dashrightarrow 00{:}16{:}13{.}480$  Like we couldn't determine it.

NOTE Confidence: 0.92679775

 $00:16:13.480 \longrightarrow 00:16:15.265$  It wasn't until we got to five

NOTE Confidence: 0.92679775

 $00{:}16{:}15{.}265 \dashrightarrow 00{:}16{:}17{.}255$  weeks and out that we had enough

NOTE Confidence: 0.92679775

 $00:16:17.255 \rightarrow 00:16:18.995$  mentions of stage that we could

NOTE Confidence: 0.92679775

 $00{:}16{:}19{.}000 \dashrightarrow 00{:}16{:}21{.}330$  sort of make that determination.

NOTE Confidence: 0.92679775

 $00{:}16{:}21.330 \dashrightarrow 00{:}16{:}23.090$  So we saw this kind of inflection point.

NOTE Confidence: 0.92679775

 $00{:}16{:}23.090 \dashrightarrow 00{:}16{:}24.740$  And so that's another thing just

NOTE Confidence: 0.92679775

 $00:16:24.740 \longrightarrow 00:16:26.624$  to to note when you're working

NOTE Confidence: 0.92679775

 $00:16:26.624 \longrightarrow 00:16:28.424$  with real-world data is that,

NOTE Confidence: 0.92679775

00:16:28.430 --> 00:16:29.682 you know, time matters,

NOTE Confidence: 0.92679775

00:16:29.682 --> 00:16:31.247 time can matter a lot.

NOTE Confidence: 0.92679775

 $00:16:31.250 \rightarrow 00:16:32.826$  And the other thing that really matters is,

- NOTE Confidence: 0.92679775
- $00:16:32.830 \longrightarrow 00:16:33.510$  is ambiguity.
- NOTE Confidence: 0.92679775
- 00:16:33.510 --> 00:16:35.550 So I mentioned we found stage
- NOTE Confidence: 0.92679775
- $00:16:35.550 \longrightarrow 00:16:37.374$  in 99% of the records.
- NOTE Confidence: 0.92679775
- $00:16:37.374 \longrightarrow 00:16:39.600$  What I didn't mention is that
- NOTE Confidence: 0.92679775
- $00{:}16{:}39{.}681 \dashrightarrow 00{:}16{:}42{.}128$  most of those are 84% had more
- NOTE Confidence: 0.92679775
- $00:16:42.128 \longrightarrow 00:16:44.444$  than one stage in their records,
- NOTE Confidence: 0.92679775
- $00:16:44.450 \dashrightarrow 00:16:47.964$  OK and some some degree of discordance.
- NOTE Confidence: 0.92679775
- $00:16:47.970 \rightarrow 00:16:51.228$  So one note might say they have stage one,
- NOTE Confidence: 0.92679775
- $00{:}16{:}51{.}230 \dashrightarrow 00{:}16{:}54{.}270$  another note night say they have stage two.
- NOTE Confidence: 0.92679775
- $00:16:54.270 \longrightarrow 00:16:56.016$  Actually when we constructed a network
- NOTE Confidence: 0.92679775
- $00{:}16{:}56.016 \dashrightarrow 00{:}16{:}58.528$  graph on the right here you see like
- NOTE Confidence: 0.92679775
- $00{:}16{:}58{.}528 \dashrightarrow 00{:}17{:}00{.}143$  every possible combination was present,
- NOTE Confidence: 0.92679775
- $00:17:00.150 \rightarrow 00:17:02.062$  every possible combination including
- NOTE Confidence: 0.92679775
- $00{:}17{:}02.062 \dashrightarrow 00{:}17{:}04.930$  you know more terms that are
- NOTE Confidence: 0.92679775
- 00:17:05.011 --> 00:17:07.216 more generic like early stage,
- NOTE Confidence: 0.92679775

 $00:17:07.220 \longrightarrow 00:17:08.094$  advanced stage.

NOTE Confidence: 0.92679775

 $00:17:08.094 \rightarrow 00:17:10.716$  Everything you know happens and you

NOTE Confidence: 0.92679775

00:17:10.716 --> 00:17:13.542 know and and and on the bottom left

NOTE Confidence: 0.92679775

00:17:13.542 --> 00:17:16.894 here you can see a histogram of Co

NOTE Confidence: 0.92679775

 $00{:}17{:}16.894 \dashrightarrow 00{:}17{:}19.404$  occurrences of various stage information.

NOTE Confidence: 0.92679775

00:17:19.410 --> 00:17:22.189 But I do think that so that

NOTE Confidence: 0.92679775

00:17:22.189 --> 00:17:23.380 really potentially ambiguous.

NOTE Confidence: 0.92679775

 $00:17:23.380 \longrightarrow 00:17:24.856$  One take home point from this

NOTE Confidence: 0.92679775

 $00{:}17{:}24.856 \dashrightarrow 00{:}17{:}26.686$  though is that we we use a

NOTE Confidence: 0.92679775

 $00:17:26.686 \rightarrow 00:17:27.996$  really simple decision rule on,

NOTE Confidence: 0.92679775

00:17:28.000 - 00:17:30.394 you know, what is the actual stage?

NOTE Confidence: 0.92679775

 $00:17:30.400 \rightarrow 00:17:32.592$  We just chose the phrase that showed up

NOTE Confidence: 0.92679775

 $00{:}17{:}32{.}592 \dashrightarrow 00{:}17{:}35{.}200$  the most OK and that and that seems to work.

NOTE Confidence: 0.92679775

 $00:17:35.200 \longrightarrow 00:17:36.520$  So if stage three shows up

NOTE Confidence: 0.92679775

 $00{:}17{:}36{.}520 \dashrightarrow 00{:}17{:}37{.}760$  in the notes 100 times,

NOTE Confidence: 0.92679775

 $00:17:37.760 \rightarrow 00:17:40.160$  in stage one shows up twice.

- NOTE Confidence: 0.92679775
- 00:17:40.160 --> 00:17:41.576 Chances are at stage three now,
- NOTE Confidence: 0.92679775
- $00{:}17{:}41.580 \dashrightarrow 00{:}17{:}45.066$  just sort of a practical rule and it worked.
- NOTE Confidence: 0.92679775
- 00:17:45.066 --> 00:17:47.644 Now getting back to that, you know,
- NOTE Confidence: 0.92679775
- $00:17:47.644 \longrightarrow 00:17:48.940$  whole idea of.
- NOTE Confidence: 0.92679775
- 00:17:48.940 --> 00:17:51.164 You know unknown or sort of lack of
- NOTE Confidence: 0.92679775
- $00:17:51.164 \rightarrow 00:17:52.696$  information and missingness which is
- NOTE Confidence: 0.92679775
- $00:17:52.696 \dashrightarrow 00:17:54.831$  a major issue with real world data.
- NOTE Confidence: 0.92679775
- $00:17:54.840 \longrightarrow 00:17:57.876$  This is another mini project we
- NOTE Confidence: 0.92679775
- $00{:}17{:}57{.}876 \dashrightarrow 00{:}18{:}00{.}324$  did looking at colon cancer and
- NOTE Confidence: 0.92679775
- $00:18:00.324 \longrightarrow 00:18:02.480$  we wanted to say could you find
- NOTE Confidence: 0.866454990625
- $00{:}18{:}02{.}553 \dashrightarrow 00{:}18{:}04{.}737$  patients with stage 3 colon cancer
- NOTE Confidence: 0.866454990625
- $00{:}18{:}04{.}740 \dashrightarrow 00{:}18{:}06{.}560$  and this was for the OCM project,
- NOTE Confidence: 0.866454990625
- $00{:}18{:}06{.}560 \dashrightarrow 00{:}18{:}07{.}628$  the oncology care model.
- NOTE Confidence: 0.866454990625
- 00:18:07.628 --> 00:18:09.568 So you know really important as a
- NOTE Confidence: 0.866454990625
- 00:18:09.568 --> 00:18:11.284 metric to know if these patients
- NOTE Confidence: 0.866454990625

 $00:18:11.284 \rightarrow 00:18:12.520$  got appropriate treatment within

NOTE Confidence: 0.866454990625

 $00{:}18{:}12{.}520 \dashrightarrow 00{:}18{:}13{.}816$  appropriate period of time.

NOTE Confidence: 0.866454990625

 $00:18:13.820 \longrightarrow 00:18:16.268$  But again what we saw here.

NOTE Confidence: 0.866454990625

 $00:18:16.270 \longrightarrow 00:18:18.118$  Is this sort of crossover at

NOTE Confidence: 0.866454990625

 $00:18:18.118 \longrightarrow 00:18:21.678$  about seven weeks, at which point?

NOTE Confidence: 0.866454990625

 $00:18:21.680 \longrightarrow 00:18:23.311$  You know, the the stage was changing NOTE Confidence: 0.866454990625

 $00:18:23.311 \longrightarrow 00:18:25.520$  or it was or is missing in the records

NOTE Confidence: 0.866454990625

 $00:18:25.520 \rightarrow 00:18:27.319$  and it wasn't until about seven weeks

NOTE Confidence: 0.866454990625

 $00{:}18{:}27{.}319 \dashrightarrow 00{:}18{:}29{.}125$  after diagnosis that you get to a

NOTE Confidence: 0.866454990625

00:18:29.130 --> 00:18:31.153 kind of steady state where you can

NOTE Confidence: 0.866454990625

00:18:31.153 --> 00:18:32.891 definitively say a patient has stage

NOTE Confidence: 0.866454990625

 $00:18:32.891 \longrightarrow 00:18:35.020$  three or we don't know the stage so.

NOTE Confidence: 0.822284337142857

00:18:37.140 --> 00:18:38.280 Here's some really interesting

NOTE Confidence: 0.822284337142857

00:18:38.280 --> 00:18:41.240 work from here, actually from Yale,

NOTE Confidence: 0.822284337142857

 $00:18:41.240 \rightarrow 00:18:43.430$  from the Radiation Oncology department,

NOTE Confidence: 0.822284337142857

 $00:18:43.430 \rightarrow 00:18:46.280$  where they they actually looked at

00:18:46.280 --> 00:18:49.182 missingness as a variable, if you will.

NOTE Confidence: 0.822284337142857

 $00:18:49.182 \longrightarrow 00:18:52.269$  So they took the National Cancer database,

NOTE Confidence: 0.822284337142857

 $00:18:52.269 \rightarrow 00:18:55.692$  the NCDB data, and they split patients

NOTE Confidence: 0.822284337142857

 $00{:}18{:}55{.}692 \dashrightarrow 00{:}18{:}58{.}637$  into whether they had complete records or

NOTE Confidence: 0.822284337142857

 $00{:}18{:}58{.}637 \dashrightarrow 00{:}19{:}01{.}696$  had some missing data from their record.

NOTE Confidence: 0.822284337142857

00:19:01.700 --> 00:19:05.208 Now the NCDB is not EHR data, right?

NOTE Confidence: 0.822284337142857

 $00{:}19{:}05{.}208 \dashrightarrow 00{:}19{:}07{.}840$  But it is based on EHR data.

NOTE Confidence: 0.822284337142857

 $00:19:07.840 \longrightarrow 00:19:09.216$  So it I would call it a real

NOTE Confidence: 0.822284337142857

00:19:09.216 --> 00:19:10.498 world data source because it's,

NOTE Confidence: 0.822284337142857

00:19:10.500 --> 00:19:13.307 you know, curated out of EHR data.

NOTE Confidence: 0.822284337142857

 $00:19:13.310 \longrightarrow 00:19:17.072$  And you know the punch line here is that

NOTE Confidence: 0.822284337142857

 $00{:}19{:}17{.}080 \dashrightarrow 00{:}19{:}19{.}252$  missing this is an independent prognostic

NOTE Confidence: 0.822284337142857

 $00{:}19{:}19{.}252 \dashrightarrow 00{:}19{:}21{.}684$  factor for survival which is really an

NOTE Confidence: 0.822284337142857

 $00{:}19{:}21.684 \dashrightarrow 00{:}19{:}23.626$  interesting thing to think about, right.

NOTE Confidence: 0.822284337142857

 $00{:}19{:}23.626 \dashrightarrow 00{:}19{:}27.100$  And and it kind of depends on what kind
00:19:27.192 --> 00:19:29.096 of what kind of cancer you have as well.

NOTE Confidence: 0.822284337142857

 $00{:}19{:}29{.}100 \dashrightarrow 00{:}19{:}31{.}236$  So they found for instance on the left.

NOTE Confidence: 0.822284337142857

 $00:19:31.240 \longrightarrow 00:19:33.384$  If you have non small cell lung cancer,

NOTE Confidence: 0.822284337142857

 $00:19:33.390 \longrightarrow 00:19:35.190$  it's the non metastatic patient

NOTE Confidence: 0.822284337142857

 $00{:}19{:}35{.}190 \dashrightarrow 00{:}19{:}37{.}773$  who had a real difference in their

NOTE Confidence: 0.822284337142857

 $00:19:37.773 \rightarrow 00:19:39.909$  prognosis if they were missing data.

NOTE Confidence: 0.822284337142857

 $00{:}19{:}39{.}910 \dashrightarrow 00{:}19{:}41{.}933$  Whereas with prostate cancer it was the

NOTE Confidence: 0.822284337142857

 $00:19:41.933 \rightarrow 00:19:43.799$  metastatic group that sort of split apart.

NOTE Confidence: 0.822284337142857

00:19:43.800 - 00:19:46.495 But either way, I mean this is.

NOTE Confidence: 0.822284337142857

 $00:19:46.500 \longrightarrow 00:19:47.718$  Yeah, just think about it for a

NOTE Confidence: 0.822284337142857

 $00{:}19{:}47.718 \dashrightarrow 00{:}19{:}49.038$  minute while I get my water bottle.

NOTE Confidence: 0.822284337142857

00:19:49.040 --> 00:19:50.480 It's.

NOTE Confidence: 0.822284337142857

 $00:19:50.480 \rightarrow 00:19:51.140$  Interesting.

NOTE Confidence: 0.854016017777778

00:19:58.460 --> 00:20:00.980 OK. It's it's certainly not something

NOTE Confidence: 0.854016017777778

 $00:20:00.980 \longrightarrow 00:20:03.644$  that we conventionally use as a metric.

NOTE Confidence: 0.854016017777778

 $00:20:03.644 \longrightarrow 00:20:05.750$  Certainly not in a clinical trial

 $00:20:05.828 \rightarrow 00:20:08.683$  because there's it's not an issue, right?

NOTE Confidence: 0.854016017777778

00:20:08.683 --> 00:20:10.998 Case report forms are complete,

NOTE Confidence: 0.854016017777778

 $00:20:11.000 \longrightarrow 00:20:13.364$  but missing this itself can be

NOTE Confidence: 0.854016017777778

 $00:20:13.364 \longrightarrow 00:20:15.839$  informative as in real world data.

NOTE Confidence: 0.854016017777778

 $00{:}20{:}15.840 \dashrightarrow 00{:}20{:}19.135$  So what I wanted to do now is actually take

NOTE Confidence: 0.854016017777778

00:20:19.135 --> 00:20:20.850 us down a little different path briefly,

NOTE Confidence: 0.854016017777778

 $00{:}20{:}20{.}850 \dashrightarrow 00{:}20{:}22{.}326$  which is a brief diversion into

NOTE Confidence: 0.854016017777778

 $00:20:22.326 \longrightarrow 00:20:23.730$  the history of medical records.

NOTE Confidence: 0.854016017777778

 $00:20:23.730 \longrightarrow 00:20:26.474$  Anybody know what the what this is?

NOTE Confidence: 0.854016017777778

 $00:20:26.480 \longrightarrow 00:20:30.700$  It's a local local.

NOTE Confidence: 0.854016017777778

00:20:30.700 --> 00:20:31.528 Eli Whitney's mill. OK,

NOTE Confidence: 0.854016017777778

 $00:20:31.528 \longrightarrow 00:20:33.739$  so it's kind of cool if you never been there.

NOTE Confidence: 0.854016017777778

 $00{:}20{:}33.740 \dashrightarrow 00{:}20{:}35.012$  It's still there.

NOTE Confidence: 0.854016017777778

 $00{:}20{:}35.012 \dashrightarrow 00{:}20{:}37.556$  Doesn't exactly look like this anymore,

NOTE Confidence: 0.854016017777778

00:20:37.560 --> 00:20:39.198 but you'll see why I'm showing

 $00:20:39.198 \longrightarrow 00:20:43.260$  this in a in a couple slides, so.

NOTE Confidence: 0.854016017777778

 $00:20:43.260 \longrightarrow 00:20:47.196$  So this is also this is a real thing.

NOTE Confidence: 0.854016017777778

 $00:20:47.200 \rightarrow 00:20:50.620$  OK, so this is one of my favorite vehicles

NOTE Confidence: 0.85401601777778

 $00:20:50.620 \rightarrow 00:20:53.918$  from the Lane Motor Museum in Nashville.

NOTE Confidence: 0.854016017777778

00:20:53.920 --> 00:20:55.150 Which is Doctor Weiner mentioned,

NOTE Confidence: 0.854016017777778

 $00{:}20{:}55{.}150 \dashrightarrow 00{:}20{:}58{.}006$  I was there for about a decade

NOTE Confidence: 0.854016017777778

 $00{:}20{:}58.010 \dashrightarrow 00{:}20{:}59.179$  and so this is a real vehicle.

NOTE Confidence: 0.85401601777778

 $00:20:59.180 \rightarrow 00:21:00.605$  There's they actually have a

NOTE Confidence: 0.854016017777778

 $00{:}21{:}00{.}605 \dashrightarrow 00{:}21{:}02{.}392$  collection of these and it makes

NOTE Confidence: 0.854016017777778

 $00{:}21{:}02{.}392 \dashrightarrow 00{:}21{:}03{.}897$  me think of electronic medical

NOTE Confidence: 0.854016017777778

00:21:03.897 --> 00:21:05.930 records because it it works, right?

NOTE Confidence: 0.854016017777778

 $00:21:05.930 \longrightarrow 00:21:08.230$  It it actually this person's

NOTE Confidence: 0.854016017777778

 $00:21:08.230 \longrightarrow 00:21:10.070$  actually driving this car.

NOTE Confidence: 0.854016017777778

 $00:21:10.070 \rightarrow 00:21:11.715$  But we don't exactly see propeller driven

NOTE Confidence: 0.854016017777778

 $00:21:11.715 \rightarrow 00:21:14.870$  cars on the roads these days, right?

NOTE Confidence: 0.854016017777778

 $00:21:14.870 \longrightarrow 00:21:17.240$  So our ER, but it works.

- NOTE Confidence: 0.854016017777778
- 00:21:17.240 --> 00:21:17.996 So MR's are functional,
- NOTE Confidence: 0.854016017777778
- $00:21:17.996 \longrightarrow 00:21:19.354$  but are they fit for the purpose
- NOTE Confidence: 0.854016017777778
- $00:21:19.354 \longrightarrow 00:21:20.628$  that we want to use them for?
- NOTE Confidence: 0.906796898333333
- 00:21:22.670 --> 00:21:24.642 I think many of us have, you know,
- NOTE Confidence: 0.906796898333333
- $00:21:24.642 \rightarrow 00:21:26.810$  some ideas about that, but you know,
- NOTE Confidence: 0.906796898333333
- $00:21:26.810 \longrightarrow 00:21:28.370$  when you think about medical records,
- NOTE Confidence: 0.906796898333333
- $00:21:28.370 \longrightarrow 00:21:31.034$  this is obviously a little bit
- NOTE Confidence: 0.906796898333333
- 00:21:31.034 --> 00:21:33.230 before the computer, you know,
- NOTE Confidence: 0.906796898333333
- $00:21:33.230 \longrightarrow 00:21:35.810$  medical records have been around for.
- NOTE Confidence: 0.906796898333333
- 00:21:35.810 --> 00:21:36.866 Almost, you know,
- NOTE Confidence: 0.906796898333333
- $00:21:36.866 \rightarrow 00:21:39.330$  3500 years in one form or another.
- NOTE Confidence: 0.906796898333333
- 00:21:39.330 --> 00:21:41.520 But what's interesting to me?
- NOTE Confidence: 0.906796898333333
- $00:21:41.520 \longrightarrow 00:21:43.180$  Is that they were primarily
- NOTE Confidence: 0.906796898333333
- $00{:}21{:}43.180 \dashrightarrow 00{:}21{:}44.840$  used for teaching or didactics.
- NOTE Confidence: 0.906796898333333
- $00:21:44.840 \longrightarrow 00:21:46.379$  Until very recently,
- NOTE Confidence: 0.906796898333333

 $00:21:46.379 \rightarrow 00:21:50.375$  that was the only purpose of medical records.

NOTE Confidence: 0.906796898333333

00:21:50.375 --> 00:21:53.225 And then sort of the second

NOTE Confidence: 0.906796898333333

00:21:53.225 --> 00:21:55.754 purpose that arose, if you will,

NOTE Confidence: 0.906796898333333

 $00:21:55.754 \rightarrow 00:21:57.444$  didn't arise until the 1880s.

NOTE Confidence: 0.906796898333333

 $00:21:57.450 \longrightarrow 00:21:59.360$  It's not that long ago if you think about it.

NOTE Confidence: 0.906796898333333

 $00:21:59.360 \longrightarrow 00:22:02.036$  And that was for legal purposes,

NOTE Confidence: 0.906796898333333

 $00:22:02.040 \longrightarrow 00:22:03.076$  legal defense.

NOTE Confidence: 0.906796898333333

00:22:03.076 --> 00:22:04.630 And, you know,

NOTE Confidence: 0.906796898333333

 $00{:}22{:}04.630 \dashrightarrow 00{:}22{:}06.868$  essentially to have a written record

NOTE Confidence: 0.906796898333333

 $00{:}22{:}06{.}868 \dashrightarrow 00{:}22{:}10{.}195$  of what happens in case there was a

NOTE Confidence: 0.906796898333333

 $00{:}22{:}10.195 \dashrightarrow 00{:}22{:}11.959$  lawsuit around medical malpractice.

NOTE Confidence: 0.906796898333333

 $00:22:11.960 \longrightarrow 00:22:14.234$  And we'll skip that and sorry

NOTE Confidence: 0.906796898333333

 $00{:}22{:}14{.}234 \dashrightarrow 00{:}22{:}16{.}503$  about the there's some Mac to

NOTE Confidence: 0.906796898333333

 $00{:}22{:}16{.}503 \dashrightarrow 00{:}22{:}18{.}525$  PC changes here with the font.

NOTE Confidence: 0.906796898333333

00:22:18.530 --> 00:22:19.784 So it's a little bit hard

NOTE Confidence: 0.906796898333333

 $00:22:19.784 \rightarrow 00:22:20.930$  to read some of this,

- NOTE Confidence: 0.906796898333333
- 00:22:20.930 --> 00:22:22.952 but you know how about billing
- NOTE Confidence: 0.906796898333333
- $00:22:22.952 \longrightarrow 00:22:24.707$  that that's billing is the
- NOTE Confidence: 0.906796898333333
- 00:22:24.707 --> 00:22:26.729 major driver rate of how our
- NOTE Confidence: 0.906796898333333
- 00:22:26.729 --> 00:22:28.509 medical records look like today.
- NOTE Confidence: 0.906796898333333
- 00:22:28.510 > 00:22:30.568 But that only really happened in
- NOTE Confidence: 0.906796898333333
- 00:22:30.570 --> 00:22:34.282 1960s is really not long ago and until
- NOTE Confidence: 0.906796898333333
- 00:22:34.282 --> 00:22:37.846 you know not so long ago physicians
- NOTE Confidence: 0.906796898333333
- 00:22:37.846 --> 00:22:41.191 were paid with food and lodging.
- NOTE Confidence: 0.906796898333333
- $00:22:41.191 \longrightarrow 00:22:43.619$  If they were lucky.
- NOTE Confidence: 0.906796898333333
- $00:22:43.620 \longrightarrow 00:22:46.910$  This is a picture from the Confucian
- NOTE Confidence: 0.906796898333333
- $00:22:46.910 \rightarrow 00:22:49.084$  medical system where there's at
- NOTE Confidence: 0.906796898333333
- 00:22:49.084 --> 00:22:51.758 least some cases where the the court
- NOTE Confidence: 0.906796898333333
- $00{:}22{:}51{.}758 \dashrightarrow 00{:}22{:}53{.}352$  physician was basically executed if
- NOTE Confidence: 0.906796898333333
- $00{:}22{:}53{.}352 \dashrightarrow 00{:}22{:}55{.}879$  the if the emperor did not get better.
- NOTE Confidence: 0.906796898333333
- 00:22:55.880 --> 00:22:58.706 So that's a pretty harsh payment
- NOTE Confidence: 0.906796898333333

- 00:22:58.706 00:23:00.380 or penalty if you will.
- NOTE Confidence: 0.906796898333333
- 00:23:00.380 --> 00:23:02.180 But you know what really changed
- NOTE Confidence: 0.906796898333333
- 00:23:02.240 --> 00:23:04.673 things was the Medicare Act of 1965,
- NOTE Confidence: 0.906796898333333
- $00:23:04.673 \rightarrow 00:23:08.338$  which basically established this profile.
- NOTE Confidence: 0.906796898333333
- 00:23:08.340 --> 00:23:09.020 You know,
- NOTE Confidence: 0.906796898333333
- $00:23:09.020 \longrightarrow 00:23:10.380$  quote usual customary and
- NOTE Confidence: 0.906796898333333
- $00:23:10.380 \longrightarrow 00:23:11.400$  reasonable fees which.
- NOTE Confidence: 0.906796898333333
- $00:23:11.400 \rightarrow 00:23:13.045$  Drive so much of what we do.
- NOTE Confidence: 0.906796898333333
- $00{:}23{:}13.050 \dashrightarrow 00{:}23{:}14.170$  And sorry about the font
- NOTE Confidence: 0.906796898333333
- $00:23:14.170 \longrightarrow 00:23:15.066$  that's messed up here,
- NOTE Confidence: 0.906796898333333
- 00:23:15.070 00:23:18.227 but there's a quote from the AMA,
- NOTE Confidence: 0.906796898333333
- $00:23:18.230 \rightarrow 00:23:19.658$  the American Medical Association,
- NOTE Confidence: 0.906796898333333
- 00:23:19.658 --> 00:23:22.059 that said that the 1965 Medicare Act
- NOTE Confidence: 0.906796898333333
- $00:23:22.059 \rightarrow 00:23:23.997$  was the most deadly challenge ever
- NOTE Confidence: 0.906796898333333
- $00{:}23{:}23{.}997 \dashrightarrow 00{:}23{:}25{.}828$  faced by the medical profession.
- NOTE Confidence: 0.906796898333333
- $00:23:25.830 \longrightarrow 00:23:28.530$  That's actual quote.

- NOTE Confidence: 0.906796898333333
- $00:23:28.530 \rightarrow 00:23:30.240$  It certainly changed things a lot.
- NOTE Confidence: 0.906796898333333
- 00:23:30.240 --> 00:23:32.970 And then what I'd argue also changed
- NOTE Confidence: 0.906796898333333
- $00{:}23{:}32{.}970 \dashrightarrow 00{:}23{:}34{.}666$  things was really more recent was
- NOTE Confidence: 0.906796898333333
- $00:23:34.666 \rightarrow 00:23:36.388$  in the 90s when the physician fee
- NOTE Confidence: 0.906796898333333
- $00{:}23{:}36{.}388 \dashrightarrow 00{:}23{:}37{.}888$  schedule was introduced and then
- NOTE Confidence: 0.906796898333333
- $00:23:37.888 \rightarrow 00:23:39.515$  something called the evaluation and
- NOTE Confidence: 0.906796898333333
- $00:23:39.515 \rightarrow 00:23:40.976$  management guidelines, which I think.
- NOTE Confidence: 0.906796898333333
- $00{:}23{:}40{.}976 \dashrightarrow 00{:}23{:}42{.}600$  A lot of us know more than
- NOTE Confidence: 0.906796898333333
- $00{:}23{:}42.658 \dashrightarrow 00{:}23{:}44.296$  we ever wanted to know about,
- NOTE Confidence: 0.906796898333333
- $00:23:44.300 \longrightarrow 00:23:47.470$  but those really changed how
- NOTE Confidence: 0.906796898333333
- $00:23:47.470 \rightarrow 00:23:50.640$  medical records were written.
- NOTE Confidence: 0.906796898333333
- $00:23:50.640 \longrightarrow 00:23:52.230$  Noticed that haven't yet used
- NOTE Confidence: 0.906796898333333
- $00:23:52.230 \longrightarrow 00:23:53.694$  the word electronic, right?
- NOTE Confidence: 0.906796898333333
- $00:23:53.694 \rightarrow 00:23:56.718$  So now what about patient care,
- NOTE Confidence: 0.906796898333333
- $00{:}23{:}56{.}720 \dashrightarrow 00{:}23{:}59{.}060$  which I think all of us want that to
- NOTE Confidence: 0.906796898333333

 $00:23:59.060 \rightarrow 00:24:01.892$  be the primary purpose of medical records.

NOTE Confidence: 0.906796898333333

 $00:24:01.892 \longrightarrow 00:24:04.550$  This kind of dates back to

NOTE Confidence: 0.906796898333333

 $00:24:04.640 \longrightarrow 00:24:06.436$  the 1800s in some ways.

NOTE Confidence: 0.906796898333333

 $00:24:06.436 \longrightarrow 00:24:08.196$  The case records of the

NOTE Confidence: 0.906796898333333

 $00{:}24{:}08.196 \dashrightarrow 00{:}24{:}09.500$  Massachusetts General Hospital.

NOTE Confidence: 0.906796898333333

00:24:09.500 --> 00:24:11.160 Introduced some ideas like

NOTE Confidence: 0.906796898333333

00:24:11.160 --> 00:24:12.820 history of presenting illness,

NOTE Confidence: 0.906796898333333

 $00:24:12.820 \longrightarrow 00:24:15.238$  past medical history and so forth,

NOTE Confidence: 0.906796898333333

 $00{:}24{:}15{.}240 \dashrightarrow 00{:}24{:}16{.}137$  medical record numbers.

NOTE Confidence: 0.906796898333333

 $00{:}24{:}16{.}137 \dashrightarrow 00{:}24{:}18{.}532$  The whole idea that you would track a

NOTE Confidence: 0.906796898333333

 $00{:}24{:}18.532 \dashrightarrow 00{:}24{:}20.233$  patient by a number was introduced at

NOTE Confidence: 0.906796898333333

00:24:20.233 --> 00:24:22.099 the Mayo Clinic in the early 1900s,

NOTE Confidence: 0.906796898333333

 $00:24:22.100 \longrightarrow 00:24:24.878$  where they also introduced the chief

NOTE Confidence: 0.906796898333333

 $00:24:24.878 \longrightarrow 00:24:27.650$  complaint and the review of systems.

NOTE Confidence: 0.906796898333333

 $00:24:27.650 \longrightarrow 00:24:30.204$  And then the American,

NOTE Confidence: 0.906796898333333

00:24:30.204 --> 00:24:32.389 the American College of Surgeons,

- NOTE Confidence: 0.764963734545455
- $00:24:32.390 \longrightarrow 00:24:33.914$  this is amazing bit of history

00:24:33.914 --> 00:24:37.900 if you didn't know in 1918, they.

NOTE Confidence: 0.764963734545455

 $00:24:37.900 \rightarrow 00:24:39.657$  There was no federal mandate of any.

NOTE Confidence: 0.764963734545455

 $00:24:39.660 \longrightarrow 00:24:41.276$  They basically mandated as

NOTE Confidence: 0.764963734545455

 $00{:}24{:}41{.}276 \dashrightarrow 00{:}24{:}42{.}488$  a professional organization.

NOTE Confidence: 0.764963734545455

 $00{:}24{:}42{.}490 \dashrightarrow 00{:}24{:}45{.}298$  They mandated that hospitals had to

NOTE Confidence: 0.764963734545455

 $00{:}24{:}45{.}298 \dashrightarrow 00{:}24{:}47{.}344$  keep records including a discharge

NOTE Confidence: 0.764963734545455

 $00:24:47.344 \longrightarrow 00:24:49.552$  summary that basically said was the,

NOTE Confidence: 0.764963734545455

 $00{:}24{:}49{.}560 \dashrightarrow 00{:}24{:}50{.}202$  you know, patient,

NOTE Confidence: 0.764963734545455

 $00:24:50.202 \rightarrow 00:24:52.419$  you know alive or dead at the time they left.

NOTE Confidence: 0.764963734545455

 $00:24:52.420 \longrightarrow 00:24:55.588$  And at that time fewer than 20% of

NOTE Confidence: 0.764963734545455

 $00:24:55.588 \rightarrow 00:24:58.260$  physicians kept any kind of record at all,

NOTE Confidence: 0.764963734545455

00:24:58.260 --> 00:25:02.830 which is like. Amazing, right?

NOTE Confidence: 0.764963734545455

 $00{:}25{:}02{.}830 \dashrightarrow 00{:}25{:}05{.}143$  Now this is tying back to that Eli Whitney.

NOTE Confidence: 0.764963734545455

 $00:25:05.150 \longrightarrow 00:25:06.950$  So this is, you know,

 $00:25:06.950 \longrightarrow 00:25:09.050$  for those that did take records,

NOTE Confidence: 0.764963734545455

 $00{:}25{:}09{.}050 \dashrightarrow 00{:}25{:}10.618$  this is kind of what they looked

NOTE Confidence: 0.764963734545455

 $00{:}25{:}10.618 \dashrightarrow 00{:}25{:}12.407$  like as these are called case books.

NOTE Confidence: 0.764963734545455

 $00:25:12.410 \rightarrow 00:25:13.994$  I'm not sure where this one is from,

NOTE Confidence: 0.764963734545455

 $00:25:14.000 \rightarrow 00:25:18.070$  but it's basically a handwritten.

NOTE Confidence: 0.764963734545455

 $00{:}25{:}18.070 \dashrightarrow 00{:}25{:}19.996$  And and what's really interesting about

NOTE Confidence: 0.764963734545455

 $00{:}25{:}19{.}996 \dashrightarrow 00{:}25{:}22{.}717$  this is that it's physician centered, right.

NOTE Confidence: 0.764963734545455

 $00:25:22.717 \longrightarrow 00:25:23.638$  This is not,

NOTE Confidence: 0.764963734545455

 $00:25:23.638 \rightarrow 00:25:26.348$  this is a diary basically it's not you know,

NOTE Confidence: 0.764963734545455

 $00:25:26.350 \longrightarrow 00:25:27.630$  one patient has one book,

NOTE Confidence: 0.764963734545455

 $00{:}25{:}27.630 \dashrightarrow 00{:}25{:}29.750$  this was written as.

NOTE Confidence: 0.764963734545455

 $00:25:29.750 \longrightarrow 00:25:30.894$  The doctor saw patients,

NOTE Confidence: 0.764963734545455

00:25:30.894 --> 00:25:33.788 so if you ever wanted to go back and say OK,

NOTE Confidence: 0.764963734545455

 $00:25:33.790 \longrightarrow 00:25:35.422$  Mr. Smith or whoever,

NOTE Confidence: 0.764963734545455

 $00:25:35.422 \longrightarrow 00:25:37.462$  like put their case together,

NOTE Confidence: 0.764963734545455

 $00:25:37.470 \longrightarrow 00:25:39.730$  good luck.

 $00:25:39.730 \longrightarrow 00:25:41.865$  So really the the most recent innovation

NOTE Confidence: 0.764963734545455

 $00:25:41.865 \rightarrow 00:25:44.065$  if you will in medical records was

NOTE Confidence: 0.764963734545455

 $00{:}25{:}44.065 \dashrightarrow 00{:}25{:}46.288$  this one and that from Austin from

NOTE Confidence: 0.764963734545455

 $00:25:46.288 \longrightarrow 00:25:48.591$  the mid 1960s which is the problem

NOTE Confidence: 0.764963734545455

 $00{:}25{:}48.591 \dashrightarrow 00{:}25{:}50.501$  oriented medical record which which

NOTE Confidence: 0.764963734545455

 $00{:}25{:}50{.}501 \dashrightarrow 00{:}25{:}53{.}003$  was conceived as a quote medical

NOTE Confidence: 0.764963734545455

 $00:25:53.003 \rightarrow 00:25:55.229$  record that guides and teaches.

NOTE Confidence: 0.764963734545455

 $00:25:55.230 \longrightarrow 00:25:56.974$  So kind of back to that idea of

NOTE Confidence: 0.764963734545455

 $00{:}25{:}56{.}974 \dashrightarrow 00{:}25{:}59{.}074$  didactics in a way and and I'm sure

NOTE Confidence: 0.764963734545455

 $00:25:59.074 \rightarrow 00:26:00.146$  everybody's familiar with this,

NOTE Confidence: 0.764963734545455

 $00:26:00.150 \longrightarrow 00:26:03.800$  this idea, this soap notes, right.

NOTE Confidence: 0.764963734545455

 $00{:}26{:}03{.}800 \dashrightarrow 00{:}26{:}06{.}754$  What I like from the paper when

NOTE Confidence: 0.764963734545455

 $00{:}26{:}06{.}754 \dashrightarrow 00{:}26{:}08{.}880$  doctor we'd introduced this idea.

NOTE Confidence: 0.764963734545455

 $00{:}26{:}08{.}880 \dashrightarrow 00{:}26{:}12{.}324$  This is a quote which I think

NOTE Confidence: 0.764963734545455

 $00:26:12.324 \rightarrow 00:26:15.040$  actually forecasts the ER right so,

 $00:26:15.040 \rightarrow 00:26:16.040$  and it's worth reading it.

NOTE Confidence: 0.764963734545455

 $00{:}26{:}16.040 \dashrightarrow 00{:}26{:}17.444$  It can be readily,

NOTE Confidence: 0.764963734545455

 $00:26:17.444 \rightarrow 00:26:19.298$  readily be seen that all narrative

NOTE Confidence: 0.764963734545455

 $00:26:19.298 \longrightarrow 00:26:20.628$  data presently in the medical

NOTE Confidence: 0.764963734545455

 $00:26:20.628 \longrightarrow 00:26:21.840$  record can be structured,

NOTE Confidence: 0.764963734545455

 $00{:}26{:}21.840 \dashrightarrow 00{:}26{:}23.618$  and in the future all narrative data

NOTE Confidence: 0.764963734545455

 $00{:}26{:}23.618 \dashrightarrow 00{:}26{:}25.855$  may be entered through a series of

NOTE Confidence: 0.764963734545455

00:26:25.855 --> 00:26:27.275 displays guaranteeing a thoroughness,

NOTE Confidence: 0.764963734545455

 $00:26:27.280 \longrightarrow 00:26:27.732$  retrievability,

NOTE Confidence: 0.764963734545455

 $00{:}26{:}27.732 \dashrightarrow 00{:}26{:}29.540$  efficiency and economy important

NOTE Confidence: 0.764963734545455

 $00{:}26{:}29{.}540 \dashrightarrow 00{:}26{:}32{.}148$  to the scientific analysis of a

NOTE Confidence: 0.764963734545455

 $00:26:32.148 \rightarrow 00:26:33.840$  type of datum that has hitherto.

NOTE Confidence: 0.764963734545455

 $00:26:33.840 \rightarrow 00:26:36.206$  Been handled in a very unrigorous manner.

NOTE Confidence: 0.764963734545455

 $00:26:36.210 \longrightarrow 00:26:37.190$  It's an amazing quote.

NOTE Confidence: 0.764963734545455

00:26:37.190 --> 00:26:37.680 I mean,

NOTE Confidence: 0.764963734545455

 $00:26:37.680 \longrightarrow 00:26:40.710$  this is essentially before any

- NOTE Confidence: 0.764963734545455
- 00:26:40.710 --> 00:26:42.102 electronic medical record, right?
- NOTE Confidence: 0.764963734545455
- $00:26:42.102 \rightarrow 00:26:44.459$  But he basically saw it, saw it coming.
- NOTE Confidence: 0.878462154285714
- 00:26:46.590 --> 00:26:48.956 I think the most important part of
- NOTE Confidence: 0.878462154285714
- $00:26:48.956 \rightarrow 00:26:51.528$  this quote is this to be concluded.
- NOTE Confidence: 0.878462154285714
- $00:26:51.530 \rightarrow 00:26:54.325$  We're living through the evolution
- NOTE Confidence: 0.878462154285714
- $00:26:54.325 \rightarrow 00:26:57.120$  of these electronic medical records.
- NOTE Confidence: 0.878462154285714
- 00:26:57.120 --> 00:26:58.596 This is actually a two-part paper,
- NOTE Confidence: 0.878462154285714
- $00:26:58.600 \rightarrow 00:26:59.510$  that's why it says this.
- NOTE Confidence: 0.878462154285714
- 00:26:59.510 --> 00:27:00.310 But I think, you know,
- NOTE Confidence: 0.878462154285714
- $00:27:00.310 \longrightarrow 00:27:02.008$  he could have been like OK,
- NOTE Confidence: 0.878462154285714
- $00:27:02.010 \rightarrow 00:27:05.174$  we don't know what's going to happen.
- NOTE Confidence: 0.878462154285714
- $00{:}27{:}05{.}180 \dashrightarrow 00{:}27{:}07{.}136$  It's worth taking a step back
- NOTE Confidence: 0.878462154285714
- $00{:}27{:}07{.}136 \dashrightarrow 00{:}27{:}09{.}068$  and saying what you know what.
- NOTE Confidence: 0.878462154285714
- $00{:}27{:}09.068 \dashrightarrow 00{:}27{:}11.372$  So now I'm going to say electron what
- NOTE Confidence: 0.878462154285714
- $00:27:11.372 \rightarrow 00:27:13.799$  is the electronic health record for?
- NOTE Confidence: 0.878462154285714

 $00:27:13.800 \rightarrow 00:27:16.168$  And it's got primary uses and secondary uses.

NOTE Confidence: 0.878462154285714

 $00{:}27{:}16.170 \dashrightarrow 00{:}27{:}18.501$  So the primary uses are are patient

NOTE Confidence: 0.878462154285714

 $00:27:18.501 \rightarrow 00:27:20.472$  care and delivery, financial billing.

NOTE Confidence: 0.878462154285714

00:27:20.472 --> 00:27:22.850 But it's this, when you talk about

NOTE Confidence: 0.878462154285714

00:27:22.850 --> 00:27:24.230 real-world data and real world evidence,

NOTE Confidence: 0.878462154285714

00:27:24.230 --> 00:27:25.546 that's a secondary use,

NOTE Confidence: 0.878462154285714

 $00:27:25.546 \rightarrow 00:27:27.950$  as it's conceived here in this model,

NOTE Confidence: 0.878462154285714

 $00:27:27.950 \rightarrow 00:27:31.016$  which the Institute of Medicine put forward.

NOTE Confidence: 0.878462154285714

 $00{:}27{:}31.020 \dashrightarrow 00{:}27{:}31.490$  All right.

NOTE Confidence: 0.878462154285714

 $00:27:31.490 \longrightarrow 00:27:32.900$  So moving ahead a little bit.

NOTE Confidence: 0.878462154285714

 $00{:}27{:}32{.}900 \dashrightarrow 00{:}27{:}35{.}730$  So this is where we were in the mid 2000s

NOTE Confidence: 0.878462154285714

 $00{:}27{:}35{.}730 \dashrightarrow 00{:}27{:}38{.}295$  and this is when I was in medical school.

NOTE Confidence: 0.878462154285714

 $00:27:38.300 \longrightarrow 00:27:40.664$  At that time there was issues

NOTE Confidence: 0.878462154285714

 $00{:}27{:}40.664 \dashrightarrow 00{:}27{:}43.812$  around funding to you know roll out

NOTE Confidence: 0.878462154285714

 $00{:}27{:}43.812 \dashrightarrow 00{:}27{:}45.800$  electronic medical records and.

NOTE Confidence: 0.878462154285714

00:27:45.800 -> 00:27:47.546 What I like on the bottom here is in

- NOTE Confidence: 0.878462154285714
- $00{:}27{:}47{.}550 \dashrightarrow 00{:}27{:}49{.}552$ 2003 the mass medical society did a
- NOTE Confidence: 0.878462154285714
- 00:27:49.552 --> 00:27:52.302 survey where 89% of physicians wanted
- NOTE Confidence: 0.878462154285714
- $00{:}27{:}52{.}302 \dashrightarrow 00{:}27{:}56{.}064$  EHR data, but 48% refused to use an ER.
- NOTE Confidence: 0.878462154285714
- $00{:}27{:}56.070 \dashrightarrow 00{:}27{:}59.213$  So little bit of a disconnect there
- NOTE Confidence: 0.878462154285714
- $00:27:59.213 \longrightarrow 00:28:01.022$  and and by 2004.
- NOTE Confidence: 0.878462154285714
- $00:28:01.022 \rightarrow 00:28:03.794$  Hardly anybody was using medical records.
- NOTE Confidence: 0.878462154285714
- $00:28:03.800 \rightarrow 00:28:05.321$  So what changed?
- NOTE Confidence: 0.878462154285714
- 00:28:05.321 --> 00:28:08.166 Arguably this this is, you know,
- NOTE Confidence: 0.878462154285714
- $00:28:08.166 \rightarrow 00:28:11.430$  one of the events that really changed things.
- NOTE Confidence: 0.878462154285714
- $00:28:11.430 \rightarrow 00:28:13.795$  Is everybody familiar with Katrina
- NOTE Confidence: 0.878462154285714
- 00:28:13.795 00:28:17.230 and what happened in in New Orleans?
- NOTE Confidence: 0.878462154285714
- 00:28:17.230 --> 00:28:20.100 Does everybody know why the?
- NOTE Confidence: 0.878462154285714
- $00{:}28{:}20{.}100 \dashrightarrow 00{:}28{:}21{.}312$  Record so there's a picture there
- NOTE Confidence: 0.878462154285714
- $00{:}28{:}21{.}312 \dashrightarrow 00{:}28{:}21{.}918$  on the right.
- NOTE Confidence: 0.878462154285714
- $00{:}28{:}21{.}920 \dashrightarrow 00{:}28{:}24{.}120$  It's every body know why those
- NOTE Confidence: 0.878462154285714

- $00:28:24.120 \longrightarrow 00:28:25.880$  were in the basement.
- NOTE Confidence: 0.878462154285714
- $00:28:25.880 \longrightarrow 00:28:26.580$  That flooded.
- NOTE Confidence: 0.878462154285714
- $00:28:26.580 \longrightarrow 00:28:29.380$  It's the they are so heavy that the
- NOTE Confidence: 0.878462154285714
- $00:28:29.451 \longrightarrow 00:28:31.701$  building literally would have collapsed
- NOTE Confidence: 0.878462154285714
- $00:28:31.701 \longrightarrow 00:28:34.641$  under the weight of the paper if
- NOTE Confidence: 0.878462154285714
- $00:28:34.641 \rightarrow 00:28:36.566$  they'd been up on higher floors.
- NOTE Confidence: 0.878462154285714
- $00:28:36.566 \longrightarrow 00:28:38.624$  So that's why they have their
- NOTE Confidence: 0.878462154285714
- $00{:}28{:}38{.}624 \dashrightarrow 00{:}28{:}40{.}592$  medical records in the basement and
- NOTE Confidence: 0.878462154285714
- $00{:}28{:}40{.}592 \dashrightarrow 00{:}28{:}42{.}320$  and they were all destroyed, right?
- NOTE Confidence: 0.878462154285714
- $00:28:42.320 \longrightarrow 00:28:43.320$  They were all just lost.
- NOTE Confidence: 0.878462154285714
- $00:28:43.320 \longrightarrow 00:28:45.498$  So, so fast.
- NOTE Confidence: 0.878462154285714
- 00:28:45.498 --> 00:28:48.078 We're a little bit the High Tech Act in 2009,
- NOTE Confidence: 0.878462154285714
- $00:28:48.078 \rightarrow 00:28:51.422$  which Obama signed this this is what really.
- NOTE Confidence: 0.878462154285714
- 00:28:51.430 --> 00:28:52.004 You know,
- NOTE Confidence: 0.878462154285714
- $00:28:52.004 \rightarrow 00:28:54.013$  gave a lot of money for institutions
- NOTE Confidence: 0.878462154285714
- $00:28:54.013 \rightarrow 00:28:56.111$  to really start putting any Mrs.

 $00{:}28{:}56{.}111 \dashrightarrow 00{:}28{:}58{.}193$  but what is interesting is if

NOTE Confidence: 0.878462154285714

 $00{:}28{:}58{.}193 \dashrightarrow 00{:}29{:}00{.}609$  you look at sort of the adoption

NOTE Confidence: 0.878462154285714

 $00{:}29{:}00{.}609 \dashrightarrow 00{:}29{:}02{.}500$  curve and there's a couple,

NOTE Confidence: 0.878462154285714

 $00:29:02.500 \longrightarrow 00:29:03.648$  I won't get into the details here.

NOTE Confidence: 0.878462154285714

 $00{:}29{:}03.650 \dashrightarrow 00{:}29{:}06.071$  There's a couple ways of like what is an

NOTE Confidence: 0.878462154285714

 $00:29:06.071 \rightarrow 00:29:08.548$  EHR basic versus complete and so forth,

NOTE Confidence: 0.878462154285714

 $00:29:08.550 \longrightarrow 00:29:11.550$  but you actually see.

NOTE Confidence: 0.878462154285714

00:29:11.550 --> 00:29:12.860 You actually see them starting,

NOTE Confidence: 0.878462154285714

00:29:12.860 --> 00:29:16.010 so here's E&<br/>amp; M coming out in the mid 90s.

NOTE Confidence: 0.878462154285714

 $00:29:16.010 \longrightarrow 00:29:19.338$  Here's Katrina in 2005.

NOTE Confidence: 0.878462154285714

 $00:29:19.340 \longrightarrow 00:29:20.280$  There's the High Tech act.

NOTE Confidence: 0.878462154285714

 $00{:}29{:}20{.}280 \dashrightarrow 00{:}29{:}21{.}963$  By the time the High Tech Act comes out,

NOTE Confidence: 0.878462154285714

 $00{:}29{:}21{.}970 \dashrightarrow 00{:}29{:}24{.}616$  actually we're like well on the

NOTE Confidence: 0.878462154285714

00:29:24.616 --> 00:29:27.248 adoption curve and so, you know,

NOTE Confidence: 0.878462154285714

 $00:29:27.248 \rightarrow 00:29:30.131$  definitely help things along, but you know,

- NOTE Confidence: 0.878462154285714
- $00:29:30.131 \rightarrow 00:29:32.016$  the process is already starting.
- NOTE Confidence: 0.878462154285714
- $00:29:32.020 \rightarrow 00:29:32.520$  Umm.
- NOTE Confidence: 0.878462154285714
- $00:29:32.520 \longrightarrow 00:29:35.020$  And then you know where.
- NOTE Confidence: 0.878462154285714
- $00:29:35.020 \longrightarrow 00:29:37.078$  So this is already five years old,
- NOTE Confidence: 0.878462154285714
- $00:29:37.080 \longrightarrow 00:29:40.209$  but I think, you know it's it's.
- NOTE Confidence: 0.878462154285714
- 00:29:40.210 --> 00:29:40.686 And sorry,
- NOTE Confidence: 0.878462154285714
- 00:29:40.686 --> 00:29:41.162 sorry again,
- NOTE Confidence: 0.878462154285714
- $00:29:41.162 \longrightarrow 00:29:42.352$  can't see the text there.
- NOTE Confidence: 0.878462154285714
- $00:29:42.360 \longrightarrow 00:29:44.115$  But you know already by
- NOTE Confidence: 0.878462154285714
- $00:29:44.115 \longrightarrow 00:29:45.870$  five years ago people were
- NOTE Confidence: 0.881632480833333
- $00:29:45.946 \rightarrow 00:29:47.392$  reporting that EHR's were
- NOTE Confidence: 0.881632480833333
- $00{:}29{:}47{.}392 \dashrightarrow 00{:}29{:}48{.}547$  a major driver of burnout.
- NOTE Confidence: 0.881632480833333
- 00:29:48.550 --> 00:29:51.346 So, so you know, it's problematic.
- NOTE Confidence: 0.881632480833333
- $00{:}29{:}51{.}350 \dashrightarrow 00{:}29{:}53{.}426$  But OK, here's a here's a
- NOTE Confidence: 0.881632480833333
- $00:29:53.426 \rightarrow 00:29:54.808$  few other challenges. So.
- NOTE Confidence: 0.881632480833333

00:29:54.808 --> 00:29:56.498 And I'm sure everybody who's

NOTE Confidence: 0.881632480833333

 $00{:}29{:}56{.}498 \dashrightarrow 00{:}29{:}58{.}360$  clinical knows these things already.

NOTE Confidence: 0.881632480833333

00:29:58.360 --> 00:30:02.162 But carry forward a copy pasting is

NOTE Confidence: 0.881632480833333

 $00:30:02.162 \longrightarrow 00:30:04.059$  ubiquitous in medical records and

NOTE Confidence: 0.881632480833333

 $00:30:04.059 \rightarrow 00:30:06.015$  there's just a ton of redundancy.

NOTE Confidence: 0.881632480833333

 $00:30:06.020 \rightarrow 00:30:09.310$  Here's a paper that basically shows that.

NOTE Confidence: 0.881632480833333

00:30:09.310 --> 00:30:10.922 Umm. You know, large,

NOTE Confidence: 0.881632480833333

 $00:30:10.922 \longrightarrow 00:30:13.340$  large portions of any note you

NOTE Confidence: 0.881632480833333

 $00:30:13.418 \longrightarrow 00:30:15.858$  particularly look at have been

NOTE Confidence: 0.881632480833333

 $00:30:15.858 \rightarrow 00:30:18.298$  copied forward from other notes.

NOTE Confidence: 0.881632480833333

 $00:30:18.300 \longrightarrow 00:30:19.030$  Progress notes.

NOTE Confidence: 0.881632480833333

00:30:19.030 --> 00:30:19.760 In particular,

NOTE Confidence: 0.881632480833333

 $00:30:19.760 \longrightarrow 00:30:21.585$  more than half of progress

NOTE Confidence: 0.881632480833333

00:30:21.585 --> 00:30:23.546 note material is copy copied

NOTE Confidence: 0.881632480833333

 $00:30:23.546 \longrightarrow 00:30:25.078$  forward from previous notes.

NOTE Confidence: 0.861171268571429

 $00:30:27.270 \longrightarrow 00:30:30.614$  This is a different study looking at you

 $00:30:30.614 \rightarrow 00:30:32.566$  know how many progress notes have a manually

NOTE Confidence: 0.861171268571429

 $00:30:32.566 \rightarrow 00:30:34.207$  entered text versus copied in any kind.

NOTE Confidence: 0.861171268571429

 $00:30:34.210 \rightarrow 00:30:37.720$  And you can see again like very few progress

NOTE Confidence: 0.861171268571429

 $00:30:37.720 \rightarrow 00:30:40.448$  notes have have fully written text.

NOTE Confidence: 0.861171268571429

 $00:30:40.450 \longrightarrow 00:30:43.510$  Which you would say is fully original, but.

NOTE Confidence: 0.861171268571429

 $00:30:43.510 \longrightarrow 00:30:44.973$  So I think it's a legitimate question

NOTE Confidence: 0.861171268571429

 $00:30:44.973 \rightarrow 00:30:46.708$  to say what are we dealing with here?

NOTE Confidence: 0.861171268571429

 $00:30:46.710 \longrightarrow 00:30:47.851$  Is it a giant pile of paper

NOTE Confidence: 0.861171268571429

 $00:30:47.851 \longrightarrow 00:30:49.099$  or is there actually meaning.

NOTE Confidence: 0.861171268571429

 $00:30:49.100 \longrightarrow 00:30:51.500$  So this is a little little tiny project

NOTE Confidence: 0.861171268571429

 $00{:}30{:}51{.}500 \dashrightarrow 00{:}30{:}54{.}032$  I did and when during fellowship where

NOTE Confidence: 0.861171268571429

 $00{:}30{:}54.032 \dashrightarrow 00{:}30{:}56.699$  I basically took one of my patients

NOTE Confidence: 0.861171268571429

 $00{:}30{:}56{.}700 \dashrightarrow 00{:}30{:}59{.}150$  charts and I counted up like how

NOTE Confidence: 0.861171268571429

 $00{:}30{:}59{.}150 \dashrightarrow 00{:}31{:}01{.}569$  many data points are in that chart.

NOTE Confidence: 0.861171268571429

 $00{:}31{:}01{.}570 \dashrightarrow 00{:}31{:}04{.}810$  And you can see the blue bars are all the

 $00:31:04.890 \rightarrow 00:31:07.300$  structured data elements like billing

NOTE Confidence: 0.861171268571429

00:31:07.300 --> 00:31:10.659 codes or vital signs or lab values.

NOTE Confidence: 0.861171268571429

 $00{:}31{:}10.660 \dashrightarrow 00{:}31{:}12.772$  And then these red bars are the words

NOTE Confidence: 0.861171268571429

 $00:31:12.772 \longrightarrow 00:31:14.716$  in the clinical documents and you

NOTE Confidence: 0.861171268571429

 $00:31:14.716 \longrightarrow 00:31:17.160$  see that that just drowns out right,

NOTE Confidence: 0.861171268571429

 $00{:}31{:}17.160 \dashrightarrow 00{:}31{:}18.282$  the structured data.

NOTE Confidence: 0.861171268571429

 $00:31:18.282 \longrightarrow 00:31:21.270$  So there's a lot of data there but.

NOTE Confidence: 0.861171268571429

 $00:31:21.270 \longrightarrow 00:31:21.972$  It's awesome.

NOTE Confidence: 0.861171268571429

00:31:21.972 --> 00:31:24.238 There's even more than that, right?

NOTE Confidence: 0.861171268571429

 $00:31:24.238 \longrightarrow 00:31:26.270$  So in this chart.

NOTE Confidence: 0.861171268571429

 $00:31:26.270 \longrightarrow 00:31:28.443$  And this is small these days, right?

NOTE Confidence: 0.861171268571429

 $00:31:28.443 \longrightarrow 00:31:30.787$  So this was more than 10 years ago,

NOTE Confidence: 0.861171268571429

 $00{:}31{:}30{.}790 \dashrightarrow 00{:}31{:}34{.}479$  there was another 277 pages of scanned

NOTE Confidence: 0.861171268571429

 $00:31:34.479 \longrightarrow 00:31:36.820$  documents with 69,000 words in them

NOTE Confidence: 0.861171268571429

 $00:31:36.820 \rightarrow 00:31:38.100$  that were basically inaccessible,

NOTE Confidence: 0.861171268571429

00:31:38.100 - 00:31:41.308 but and the take home point here.

00:31:41.310 - 00:31:43.650 Is that this is what it all boils down to,

NOTE Confidence: 0.861171268571429

 $00:31:43.650 \longrightarrow 00:31:45.600$  OK?

NOTE Confidence: 0.861171268571429

00:31:45.600 --> 00:31:48.106 Patient with diffuse large B cell lymphoma.

NOTE Confidence: 0.861171268571429

 $00:31:48.110 \longrightarrow 00:31:50.036$  It was a complete remission after

NOTE Confidence: 0.861171268571429

 $00:31:50.036 \rightarrow 00:31:51.930$  getting 6 cycles of our chop.

NOTE Confidence: 0.861171268571429

 $00{:}31{:}51{.}930 \dashrightarrow 00{:}31{:}53{.}806$  I think that's enough for most research.

NOTE Confidence: 0.861171268571429

00:31:53.810 --> 00:31:56.990 OK now how can we,

NOTE Confidence: 0.861171268571429

 $00:31:56.990 \longrightarrow 00:31:58.698$  how can we boil things down like

NOTE Confidence: 0.861171268571429

 $00:31:58.698 \dashrightarrow 00:32:00.272$  that because that's that's kind of

NOTE Confidence: 0.861171268571429

 $00:32:00.272 \rightarrow 00:32:01.862$  maybe what we're talking about here.

NOTE Confidence: 0.861171268571429

 $00{:}32{:}01.870 \dashrightarrow 00{:}32{:}05.686$  So and of course there's more to it right.

NOTE Confidence: 0.861171268571429

 $00{:}32{:}05.690 \dashrightarrow 00{:}32{:}08.906$  But you know when you think about what's

NOTE Confidence: 0.861171268571429

 $00:32:08.906 \dashrightarrow 00:32:12.654$  in ER's or EHR's and and what is not.

NOTE Confidence: 0.861171268571429

00:32:12.660 --> 00:32:13.007 Umm.

NOTE Confidence: 0.861171268571429

00:32:13.007 -> 00:32:15.089 You have to know what you're,

 $00:32:15.090 \rightarrow 00:32:16.467$  you have to know what you're going to find,

NOTE Confidence: 0.861171268571429

00:32:16.470 --> 00:32:16.794 right.

NOTE Confidence: 0.861171268571429

 $00:32:16.794 \rightarrow 00:32:19.062$  So, so let's say you know you've

NOTE Confidence: 0.861171268571429

 $00:32:19.062 \rightarrow 00:32:20.689$  unlocked this medical record,

NOTE Confidence: 0.861171268571429

 $00{:}32{:}20.690 \dashrightarrow 00{:}32{:}21.760$  but it's not necessarily going

NOTE Confidence: 0.861171268571429

 $00:32:21.760 \longrightarrow 00:32:22.830$  to have what you want.

NOTE Confidence: 0.861171268571429

00:32:22.830 --> 00:32:25.050 So here's, here's some, you know,

NOTE Confidence: 0.861171268571429

00:32:25.050 --> 00:32:28.010 basically some big buckets, right.

NOTE Confidence: 0.861171268571429

 $00{:}32{:}28.010 \dashrightarrow 00{:}32{:}29.536$  So you're going to find the person's

NOTE Confidence: 0.861171268571429

 $00:32:29.536 \rightarrow 00:32:31.003$  date of birth, no problem, right.

NOTE Confidence: 0.861171268571429

00:32:31.003 -> 00:32:32.629 But you're not going to find

NOTE Confidence: 0.861171268571429

 $00:32:32.629 \rightarrow 00:32:33.968$  probably where they were born,

NOTE Confidence: 0.861171268571429

 $00{:}32{:}33{.}970 \dashrightarrow 00{:}32{:}35{.}170$  the circumstances of their birth,

NOTE Confidence: 0.861171268571429

 $00:32:35.170 \longrightarrow 00:32:36.880$  where their complications.

NOTE Confidence: 0.861171268571429

 $00:32:36.880 \rightarrow 00:32:39.036$  Very unlikely, because they will have.

NOTE Confidence: 0.861171268571429

 $00:32:39.036 \longrightarrow 00:32:40.560$  You know they won't have lived

- NOTE Confidence: 0.861171268571429
- $00:32:40.614 \longrightarrow 00:32:42.049$  their whole system with their
- NOTE Confidence: 0.861171268571429
- $00{:}32{:}42.049 \dashrightarrow 00{:}32{:}43.484$  life within the electronic air,
- NOTE Confidence: 0.861171268571429
- $00:32:43.490 \longrightarrow 00:32:45.324$  and they won't have all that data.
- NOTE Confidence: 0.861171268571429
- $00:32:45.330 \rightarrow 00:32:46.986$  You might find their biologic sex,
- NOTE Confidence: 0.861171268571429
- 00:32:46.990 --> 00:32:47.342 no problem,
- NOTE Confidence: 0.861171268571429
- 00:32:47.342 --> 00:32:48.398 but are you going to find
- NOTE Confidence: 0.861171268571429
- 00:32:48.398 --> 00:32:49.210 their gender orientation,
- NOTE Confidence: 0.861171268571429
- $00:32:49.210 \longrightarrow 00:32:50.215$  that sexual identity?
- NOTE Confidence: 0.861171268571429
- 00:32:50.215 --> 00:32:52.225 You'll find race in this city,
- NOTE Confidence: 0.861171268571429
- $00:32:52.230 \longrightarrow 00:32:54.715$  but are you going to find other
- NOTE Confidence: 0.861171268571429
- $00:32:54.715 \rightarrow 00:32:56.310$  social determinants of health?
- NOTE Confidence: 0.861171268571429
- $00:32:56.310 \longrightarrow 00:32:57.550$  You'll find the medications
- NOTE Confidence: 0.861171268571429
- $00{:}32{:}57{.}550 \dashrightarrow 00{:}32{:}58{.}790$  that they are prescribed,
- NOTE Confidence: 0.861171268571429
- $00:32:58.790 \dashrightarrow 00:33:01.446$  but will you find what they actually took,
- NOTE Confidence: 0.861171268571429
- $00{:}33{:}01{.}450 \dashrightarrow 00{:}33{:}03{.}529$  the medication that they took and the
- NOTE Confidence: 0.861171268571429

 $00:33:03.529 \rightarrow 00:33:05.432$  regimens and we're going to get into

NOTE Confidence: 0.861171268571429

 $00:33:05.432 \rightarrow 00:33:07.562$  that next you'll find laboratory tests,

NOTE Confidence: 0.861171268571429

 $00:33:07.562 \rightarrow 00:33:10.040$  but you want necessarily find images.

NOTE Confidence: 0.861171268571429

 $00:33:10.040 \longrightarrow 00:33:11.528$  And so forth.

NOTE Confidence: 0.861171268571429

00:33:11.528 --> 00:33:15.000 So kind of you know as moving

NOTE Confidence: 0.898628412727273

00:33:15.117 --> 00:33:17.040 forward. Thinking about what you know,

NOTE Confidence: 0.898628412727273

 $00:33:17.040 \longrightarrow 00:33:19.760$  the low hanging fruit.

NOTE Confidence: 0.898628412727273

00:33:19.760 --> 00:33:21.848 You know it's the cancer type,

NOTE Confidence: 0.898628412727273

 $00{:}33{:}21.850 \dashrightarrow 00{:}33{:}23.482$  it's easy like we don't need to create

NOTE Confidence: 0.898628412727273

 $00:33:23.482 \rightarrow 00:33:25.147$  a new system to get cancer type.

NOTE Confidence: 0.898628412727273

 $00:33:25.150 \dashrightarrow 00:33:27.376$  You can get that from billing codes,

NOTE Confidence: 0.898628412727273

 $00:33:27.380 \longrightarrow 00:33:28.426$  registry data.

NOTE Confidence: 0.898628412727273

 $00{:}33{:}28.426 \dashrightarrow 00{:}33{:}32.087$  The treatments are hard like our chop

NOTE Confidence: 0.898628412727273

 $00:33:32.087 \rightarrow 00:33:34.452$  times 6, that's hard determining that

NOTE Confidence: 0.898628412727273

 $00:33:34.452 \rightarrow 00:33:36.810$  the patients in a complete remission,

NOTE Confidence: 0.898628412727273

 $00:33:36.810 \longrightarrow 00:33:37.479$  that's really hard.

 $00:33:37.479 \longrightarrow 00:33:39.040$  So what I go for the middle,

NOTE Confidence: 0.898628412727273

00:33:39.040 --> 00:33:40.325 I don't go for the middle ground, right,

NOTE Confidence: 0.898628412727273

 $00:33:40.325 \rightarrow 00:33:42.620$  I'm going to tackle the thing in the middle.

NOTE Confidence: 0.898628412727273

 $00:33:42.620 \rightarrow 00:33:45.124$  So now I'm going to switch gears here

NOTE Confidence: 0.898628412727273

 $00{:}33{:}45{.}124 \dashrightarrow 00{:}33{:}48{.}779$  for a bit and talk about our work on

NOTE Confidence: 0.898628412727273

 $00:33:48.779 \longrightarrow 00:33:51.360$  standardizing systemic anti cancer treatment.

NOTE Confidence: 0.898628412727273

 $00{:}33{:}51{.}360 \dashrightarrow 00{:}33{:}55{.}188$  And before I get into that.

NOTE Confidence: 0.898628412727273

 $00:33:55.190 \rightarrow 00:33:58.025$  If you've not seen this XKCD cartoon,

NOTE Confidence: 0.898628412727273

00:33:58.030 --> 00:33:59.155 it's a classic.

NOTE Confidence: 0.898628412727273

00:33:59.155 --> 00:34:01.437 And this is a challenge, right?

NOTE Confidence: 0.898628412727273

 $00{:}34{:}01{.}437 \dashrightarrow 00{:}34{:}04{.}286$  Whenever you decide to create a new

NOTE Confidence: 0.898628412727273

 $00{:}34{:}04.286 \dashrightarrow 00{:}34{:}07.210$  standard or you actually just you know.

NOTE Confidence: 0.898628412727273

 $00{:}34{:}07{.}210 \dashrightarrow 00{:}34{:}08{.}650$  Just creating more complexity or not.

NOTE Confidence: 0.898628412727273

 $00{:}34{:}08.650 \dashrightarrow 00{:}34{:}09.697$  Hopefully we're not.

NOTE Confidence: 0.898628412727273

 $00:34:09.697 \rightarrow 00:34:12.140$  Well, what we did in this space,

 $00:34:12.140 \rightarrow 00:34:14.108$  there really weren't 14 existing standards.

NOTE Confidence: 0.898628412727273

 $00:34:14.110 \longrightarrow 00:34:15.094$  There were none.

NOTE Confidence: 0.898628412727273

 $00:34:15.094 \rightarrow 00:34:17.062$  And so as everybody here knows,

NOTE Confidence: 0.898628412727273

 $00:34:17.070 \rightarrow 00:34:19.128$  I could skip past this slide.

NOTE Confidence: 0.898628412727273

00:34:19.130 --> 00:34:22.430 Chemotherapy regimens are complicated and

NOTE Confidence: 0.898628412727273

 $00{:}34{:}22{.}430 \dashrightarrow 00{:}34{:}25{.}730$  given in cyclic fashion combinations.

NOTE Confidence: 0.898628412727273

 $00{:}34{:}25{.}730 \dashrightarrow 00{:}34{:}27{.}425$  This was the standard when

NOTE Confidence: 0.898628412727273

 $00:34:27.425 \longrightarrow 00:34:29.550$  we got started on our work.

NOTE Confidence: 0.898628412727273

00:34:29.550 --> 00:34:30.602 This is, you know,

NOTE Confidence: 0.898628412727273

 $00{:}34{:}30{.}602 \dashrightarrow 00{:}34{:}32{.}180$  one example of these things called

NOTE Confidence: 0.898628412727273

00:34:32.237 --> 00:34:33.728 cancer chemotherapy handbooks,

NOTE Confidence: 0.898628412727273

00:34:33.730 --> 00:34:37.006 kind of recipe books, physical books,

NOTE Confidence: 0.898628412727273

00:34:37.010 --> 00:34:37.341 right.

NOTE Confidence: 0.898628412727273

 $00:34:37.341 \longrightarrow 00:34:38.996$  With some some details here,

NOTE Confidence: 0.898628412727273

 $00:34:39.000 \longrightarrow 00:34:41.224$  but maybe not enough.

NOTE Confidence: 0.898628412727273

 $00:34:41.224 \rightarrow 00:34:45.740$  Here's another example from 2005.

00:34:45.740 --> 00:34:48.953 Which if you kind of look in

NOTE Confidence: 0.898628412727273

 $00:34:48.953 \longrightarrow 00:34:51.000$  detail about what's there.

NOTE Confidence: 0.898628412727273

 $00:34:51.000 \rightarrow 00:34:54.269$  There's there's a lot of optionality here,

NOTE Confidence: 0.898628412727273

 $00{:}34{:}54{.}270 \dashrightarrow 00{:}34{:}55{.}694$  some of the references.

NOTE Confidence: 0.898628412727273

 $00{:}34{:}55{.}694 \dashrightarrow 00{:}34{:}58{.}410$  Here's a little excerpt from the Adenoma.

NOTE Confidence: 0.898628412727273

00:34:58.410 --> 00:34:59.690 I don't know carcinoma of

NOTE Confidence: 0.898628412727273

 $00:34:59.690 \rightarrow 00:35:00.458$  unknown primary section,

NOTE Confidence: 0.898628412727273

 $00:35:00.460 \dashrightarrow 00:35:02.532$  but the references are to non small

NOTE Confidence: 0.898628412727273

 $00{:}35{:}02{.}532 \dashrightarrow 00{:}35{:}04{.}931$  cell lung cancer so there's sort of a

NOTE Confidence: 0.898628412727273

 $00:35:04.931 \dashrightarrow 00:35:06.730$  mismatch there in the evidence base.

NOTE Confidence: 0.898628412727273

 $00:35:06.730 \longrightarrow 00:35:09.250$  So what we did is we.

NOTE Confidence: 0.898628412727273

 $00{:}35{:}09{.}250 \dashrightarrow 00{:}35{:}10{.}570$  Really basically tried to collect

NOTE Confidence: 0.898628412727273

 $00{:}35{:}10.570 \dashrightarrow 00{:}35{:}11.890$  all this information and put

NOTE Confidence: 0.898628412727273

00:35:11.936 --> 00:35:13.126 it into a computable format,

NOTE Confidence: 0.898628412727273

 $00:35:13.130 \dashrightarrow 00:35:16.130$  which is our hemlock.org website and

 $00:35:16.130 \longrightarrow 00:35:18.890$  the ontology that comes from it.

NOTE Confidence: 0.898628412727273

 $00{:}35{:}18.890 \dashrightarrow 00{:}35{:}21.725$  So he might.org is a is a website with

NOTE Confidence: 0.898628412727273

 $00:35:21.725 \rightarrow 00:35:24.689$  the goal to collect all standard of

NOTE Confidence: 0.898628412727273

 $00:35:24.689 \rightarrow 00:35:27.230$  care systemic anti cancer treatment.

NOTE Confidence: 0.898628412727273

 $00:35:27.230 \longrightarrow 00:35:28.523$  That's the goal.

NOTE Confidence: 0.898628412727273

 $00{:}35{:}28{.}523 \dashrightarrow 00{:}35{:}32{.}155$  It's a big goal and at the website has

NOTE Confidence: 0.898628412727273

 $00{:}35{:}32.155 \dashrightarrow 00{:}35{:}35.080$  grown over more than a decade now.

NOTE Confidence: 0.898628412727273

00:35:35.080 --> 00:35:37.120 Of almost 1000 primary content pages,

NOTE Confidence: 0.898628412727273

00:35:37.120 --> 00:35:38.656 over 7000 references,

NOTE Confidence: 0.898628412727273

 $00:35:38.656 \rightarrow 00:35:41.216$  and a large editorial board,

NOTE Confidence: 0.898628412727273

 $00:35:41.220 \rightarrow 00:35:44.216$  actually members of which are from Yale.

NOTE Confidence: 0.898628412727273

 $00:35:44.220 \rightarrow 00:35:46.110$  And and many page views,

NOTE Confidence: 0.898628412727273

00:35:46.110 --> 00:35:49.288 so 1.4 million page views last year,

NOTE Confidence: 0.898628412727273

 $00{:}35{:}49{.}290 \dashrightarrow 00{:}35{:}52{.}300$  we do get visitors from all over

NOTE Confidence: 0.898628412727273

 $00:35:52.300 \dashrightarrow 00:35:55.429$  the world were primarily US based.

NOTE Confidence: 0.898628412727273

 $00:35:55.430 \dashrightarrow 00:35:57.510$  I always like to throw in that we've

 $00{:}35{:}57{.}510 \dashrightarrow 00{:}35{:}59{.}590$  had one visitor from North Korea.

NOTE Confidence: 0.898628412727273

00:35:59.590 --> 00:36:00.808 I don't know who it is,

NOTE Confidence: 0.898628412727273

 $00{:}36{:}00{.}810 \dashrightarrow 00{:}36{:}03{.}426$  but I don't think I want to know.

NOTE Confidence: 0.898628412727273

 $00:36:03.430 \rightarrow 00:36:05.806$  So what what can we do with this website?

NOTE Confidence: 0.898628412727273

 $00:36:05.810 \longrightarrow 00:36:08.330$  So what we did over time,

NOTE Confidence: 0.898628412727273

 $00:36:08.330 \longrightarrow 00:36:10.360$  over the past 11 years is create

NOTE Confidence: 0.898628412727273

 $00:36:10.360 \longrightarrow 00:36:12.231$  a structure such that we could

NOTE Confidence: 0.898628412727273

 $00:36:12.231 \longrightarrow 00:36:13.796$  actually take the content and

NOTE Confidence: 0.898628412727273

 $00:36:13.796 \longrightarrow 00:36:15.260$  develop a formal model.

NOTE Confidence: 0.898628412727273

 $00:36:15.260 \longrightarrow 00:36:17.120$  And so this is the model?

NOTE Confidence: 0.898628412727273

 $00:36:17.120 \longrightarrow 00:36:19.507$  Or this is part of the model?

NOTE Confidence: 0.898628412727273

00:36:19.510 --> 00:36:21.070 And I don't have time right

NOTE Confidence: 0.898628412727273

 $00{:}36{:}21.070 \dashrightarrow 00{:}36{:}22.110$  now obviously to kind

NOTE Confidence: 0.88690812375

 $00{:}36{:}22.169 \dashrightarrow 00{:}36{:}23.867$  of go through all these details,

NOTE Confidence: 0.88690812375

 $00{:}36{:}23.870 \dashrightarrow 00{:}36{:}27.188$  but it's somewhat complex and enlarge

 $00:36:27.188 \rightarrow 00:36:30.650$  we have over 100,000 concepts and

NOTE Confidence: 0.88690812375

 $00{:}36{:}30{.}650 \dashrightarrow 00{:}36{:}33{.}626$ 300,000 ways in which those are

NOTE Confidence: 0.88690812375

 $00{:}36{:}33{.}626 \dashrightarrow 00{:}36{.}36{.}380$  interrelated in the latest version.

NOTE Confidence: 0.88690812375

 $00:36:36.380 \longrightarrow 00:36:39.290$  This is yeah, this is basically,

NOTE Confidence: 0.88690812375

00:36:39.290 --> 00:36:41.420 this is showing, you know,

NOTE Confidence: 0.88690812375

 $00:36:41.420 \longrightarrow 00:36:42.536$  I don't have time to actually

NOTE Confidence: 0.88690812375

 $00:36:42.536 \longrightarrow 00:36:43.094$  show the website.

NOTE Confidence: 0.88690812375

 $00{:}36{:}43.100 \dashrightarrow 00{:}36{:}45.302$  This is a screen shot from the

NOTE Confidence: 0.88690812375

 $00{:}36{:}45{.}302 \dashrightarrow 00{:}36{:}46{.}770$  website showing basically that

NOTE Confidence: 0.88690812375

 $00:36:46.833 \longrightarrow 00:36:48.729$  each regimen on the website is.

NOTE Confidence: 0.88690812375

 $00:36:48.730 \longrightarrow 00:36:50.490$  In such a way that we can take

NOTE Confidence: 0.88690812375

 $00{:}36{:}50{.}490 \dashrightarrow 00{:}36{:}52{.}074$  all those pieces and put them

NOTE Confidence: 0.88690812375

 $00:36:52.074 \longrightarrow 00:36:53.694$  into the into the data model.

NOTE Confidence: 0.88690812375

 $00{:}36{:}53.700 \dashrightarrow 00{:}36{:}55.149$  And and then we can start to do

NOTE Confidence: 0.88690812375

 $00{:}36{:}55{.}149 \dashrightarrow 00{:}36{:}56{.}477$  cool things with real world data.

NOTE Confidence: 0.88690812375

 $00:36:56.480 \longrightarrow 00:36:59.119$  So here's a project that we did

- NOTE Confidence: 0.88690812375
- $00{:}36{:}59{.}119 \dashrightarrow 00{:}37{:}01{.}630$  with with some folks in South
- NOTE Confidence: 0.88690812375
- $00:37:01.630 \rightarrow 00:37:06.600$  Korea who basically had access to.
- NOTE Confidence: 0.88690812375
- $00:37:06.600 \rightarrow 00:37:08.256$  Essentially medication level database.
- NOTE Confidence: 0.88690812375
- 00:37:08.256 --> 00:37:11.115 And remember I mentioned you know way
- NOTE Confidence: 0.88690812375
- $00:37:11.115 \rightarrow 00:37:13.327$  back when that we might get medications,
- NOTE Confidence: 0.88690812375
- $00{:}37{:}13{.}330 \dashrightarrow 00{:}37{:}14{.}955$  but to actually understand regimens
- NOTE Confidence: 0.88690812375
- 00:37:14.955 --> 00:37:16.970 we have to do something extra.
- NOTE Confidence: 0.88690812375
- 00:37:16.970 --> 00:37:18.909 And So what they did is they
- NOTE Confidence: 0.88690812375
- $00{:}37{:}18{.}909 \dashrightarrow 00{:}37{:}20{.}945$  applied our model and they mapped
- NOTE Confidence: 0.88690812375
- $00:37:20.945 \longrightarrow 00:37:22.465$  medications through regiments and
- NOTE Confidence: 0.88690812375
- $00:37:22.465 \rightarrow 00:37:24.711$  and they were able to look basically
- NOTE Confidence: 0.88690812375
- $00:37:24.711 \longrightarrow 00:37:26.914$  over a decade of time 2008 to 18.
- NOTE Confidence: 0.88690812375
- 00:37:26.914 --> 00:37:28.888 And you can see here that you know the NOTE Confidence: 0.88690812375
- 00:37:28.888 --> 00:37:30.764 changing pattern of care in that country.
- NOTE Confidence: 0.88690812375
- $00:37:30.770 \longrightarrow 00:37:34.885$  So you see that for example of you know NOTE Confidence: 0.88690812375

 $00:37:34.885 \rightarrow 00:37:37.040$  bevacizumab wasn't used really until

NOTE Confidence: 0.88690812375

 $00:37:37.114 \longrightarrow 00:37:40.054$  2014 and then it started getting popular.

NOTE Confidence: 0.88690812375

 $00:37:40.060 \longrightarrow 00:37:42.020$  And by the year 2018,

NOTE Confidence: 0.88690812375

00:37:42.020 --> 00:37:42.926 it's, you know,

NOTE Confidence: 0.88690812375

 $00{:}37{:}42.926 \dashrightarrow 00{:}37{:}44.436$  full Fox and Bevacizumab Kappa,

NOTE Confidence: 0.88690812375

 $00:37:44.440 \rightarrow 00:37:48.000$  a good chunk of the treatment regimens,

NOTE Confidence: 0.88690812375

 $00{:}37{:}48.000 \dashrightarrow 00{:}37{:}50.436$  whereas something like fluorouracil

NOTE Confidence: 0.88690812375

 $00:37:50.436 \rightarrow 00:37:52.263$  monotherapy essentially disappears

NOTE Confidence: 0.88690812375

 $00{:}37{:}52.263 \dashrightarrow 00{:}37{:}55.448$  off the off the scene by the

NOTE Confidence: 0.88690812375

 $00:37:55.448 \longrightarrow 00:37:57.362$  by the time you get there.

NOTE Confidence: 0.88690812375

 $00{:}37{:}57{.}370 \dashrightarrow 00{:}37{:}59{.}064$  This is much more recent so that

NOTE Confidence: 0.88690812375

 $00:37:59.064 \rightarrow 00:38:00.964$  that's from a couple of years ago

NOTE Confidence: 0.88690812375

 $00{:}38{:}00{.}964 \dashrightarrow 00{:}38{:}03{.}150$  now we're working with folks at the.

NOTE Confidence: 0.8194428005

 $00:38:05.210 \longrightarrow 00:38:07.736$  University of California System have a

NOTE Confidence: 0.8194428005

00:38:07.736 --> 00:38:10.080 really cool combined database across all

NOTE Confidence: 0.8194428005

 $00{:}38{:}10{.}080 \dashrightarrow 00{:}38{:}12{.}456$  the UC's and California is kind of a.

 $00{:}38{:}12.460 \dashrightarrow 00{:}38{:}14.364$  You know, country unto itself, once you

NOTE Confidence: 0.8194428005

 $00:38:14.364 \rightarrow 00:38:16.416$  start putting all this data together,

NOTE Confidence: 0.8194428005

 $00:38:16.420 \longrightarrow 00:38:20.022$  this is just from UCSF and again

NOTE Confidence: 0.8194428005

00:38:20.022 --> 00:38:22.777 we're taking, we're taking medication

NOTE Confidence: 0.8194428005

00:38:22.777 --> 00:38:25.324 exposure data including time stamps

NOTE Confidence: 0.8194428005

 $00{:}38{:}25{.}324 \dashrightarrow 00{:}38{:}28{.}604$  and we're mapping that to regimens.

NOTE Confidence: 0.8194428005

 $00:38:28.604 \rightarrow 00:38:31.684$  And and you see that.

NOTE Confidence: 0.8194428005

00:38:31.690 - 00:38:35.638 At least nowadays, full fernox is

NOTE Confidence: 0.8194428005

 $00{:}38{:}35{.}638 \dashrightarrow 00{:}38{:}39{.}070$  the most popular regimen there.

NOTE Confidence: 0.8194428005

 $00:38:39.070 \longrightarrow 00:38:40.426$  And so that's that alone is

NOTE Confidence: 0.8194428005

 $00:38:40.426 \rightarrow 00:38:43.020$  an interesting thing, right?

NOTE Confidence: 0.8194428005

00:38:43.020 --> 00:38:44.782 You also see some funny things, right?

NOTE Confidence: 0.8194428005

 $00{:}38{:}44{.}782 \dashrightarrow 00{:}38{:}47{.}038$ Like so I didn't know Leuprolide was a

NOTE Confidence: 0.8194428005

 $00{:}38{:}47.038 \dashrightarrow 00{:}38{:}50.260$  treatment for pancreatic cancer, did you?

NOTE Confidence: 0.8194428005

 $00:38:50.260 \longrightarrow 00:38:53.842$  Is it? Not no, right. No.

 $00:38:53.842 \rightarrow 00:38:55.860$  But these are real patients, right.

NOTE Confidence: 0.8194428005

 $00:38:55.860 \rightarrow 00:38:57.360$  And they actually have second malignancies.

NOTE Confidence: 0.8194428005

 $00:38:57.360 \longrightarrow 00:38:58.944$  So these are people who have

NOTE Confidence: 0.8194428005

 $00:38:58.944 \dashrightarrow 00:39:00.402$  also have prostate cancer and

NOTE Confidence: 0.8194428005

 $00:39:00.402 \rightarrow 00:39:01.810$  they're also getting leuprolide.

NOTE Confidence: 0.8194428005

00:39:01.810 --> 00:39:04.450 So you, you, you kind of have to you know,

NOTE Confidence: 0.8194428005

 $00:39:04.450 \dashrightarrow 00:39:06.450$  it's not enough to get that data out.

NOTE Confidence: 0.8194428005

 $00:39:06.450 \longrightarrow 00:39:07.284$  You've got to,

NOTE Confidence: 0.8194428005

00:39:07.284 --> 00:39:08.873 you got to apply knowledge, right.

NOTE Confidence: 0.8194428005

00:39:08.873 --> 00:39:10.224 You've got to, you've got to determine,

NOTE Confidence: 0.8194428005

00:39:10.230 --> 00:39:11.787 you know, am I, what am I looking at?

NOTE Confidence: 0.8194428005

 $00:39:11.790 \longrightarrow 00:39:13.926$  Does it make sense, is it?

NOTE Confidence: 0.8194428005

 $00:39:13.930 \longrightarrow 00:39:17.180$  Is it relevant and and?

NOTE Confidence: 0.8194428005

 $00:39:17.180 \longrightarrow 00:39:19.217$  And so that that's why we're

NOTE Confidence: 0.8194428005

 $00{:}39{:}19{.}217 \dashrightarrow 00{:}39{:}20{.}599$  seeing things like that so.

NOTE Confidence: 0.8194428005

 $00:39:20.600 \rightarrow 00:39:23.522$  Umm. Here's another kind of.
- NOTE Confidence: 0.8194428005
- $00:39:23.522 \longrightarrow 00:39:24.048$  Here's another.
- NOTE Confidence: 0.8194428005
- $00:39:24.050 \dashrightarrow 00:39:25.570$  Gives you a taste of what we can look at.
- NOTE Confidence: 0.8194428005
- $00{:}39{:}25{.}570 \dashrightarrow 00{:}39{:}28{.}972$  So that this is this is looking at folfirinox
- NOTE Confidence: 0.8194428005
- $00:39:28.972 \rightarrow 00:39:32.137$  and and then looking at cycle by cycle.
- NOTE Confidence: 0.8194428005
- $00:39:32.140 \longrightarrow 00:39:32.914$  What's happening?
- NOTE Confidence: 0.8194428005
- $00:39:32.914 \dashrightarrow 00:39:35.236$  So one of my long-term interests,
- NOTE Confidence: 0.8194428005
- $00:39:35.240 \longrightarrow 00:39:37.400$  as well as Doctor Zach here,
- NOTE Confidence: 0.8194428005
- $00:39:37.400 \rightarrow 00:39:39.890$  is to understand treatment delays,
- NOTE Confidence: 0.8194428005
- $00:39:39.890 \longrightarrow 00:39:42.080$  dose reductions.
- NOTE Confidence: 0.8194428005
- 00:39:42.080 --> 00:39:44.887 Removals of medications from a regimen drop,
- NOTE Confidence: 0.8194428005
- $00{:}39{:}44{.}890 \dashrightarrow 00{:}39{:}47{.}098$  you know, dropping a drug and this starts
- NOTE Confidence: 0.8194428005
- $00:39:47.098 \longrightarrow 00:39:49.555$  to get at that and you can kind of see,
- NOTE Confidence: 0.8194428005
- 00:39:49.560 --> 00:39:50.104 you know,
- NOTE Confidence: 0.8194428005
- $00{:}39{:}50{.}104 \dashrightarrow 00{:}39{:}52{.}280$  each of those bars represents cycle to cycle,
- NOTE Confidence: 0.8194428005
- $00:39:52.280 \longrightarrow 00:39:54.200$  the cycle you see.
- NOTE Confidence: 0.8194428005

- $00:39:54.200 \rightarrow 00:39:54.680$  People.
- NOTE Confidence: 0.8194428005
- $00:39:54.680 \longrightarrow 00:39:56.032$  People dropping out, right.
- NOTE Confidence: 0.8194428005
- $00{:}39{:}56{.}032 \dashrightarrow 00{:}39{:}58{.}982$  And and so and then you can actually see
- NOTE Confidence: 0.8194428005
- $00:39:58.982 \rightarrow 00:40:01.639$  why and you can see on the top here.
- NOTE Confidence: 0.8194428005
- $00{:}40{:}01{.}640 \dashrightarrow 00{:}40{:}03{.}536$  These, these bands at the top are showing.
- NOTE Confidence: 0.8194428005
- $00:40:03.540 \longrightarrow 00:40:05.220$  You know, these these are folks.
- NOTE Confidence: 0.8194428005
- $00:40:05.220 \longrightarrow 00:40:06.318$  You don't think that you have
- NOTE Confidence: 0.8194428005
- $00:40:06.318 \longrightarrow 00:40:07.050$  a pointer or something.
- NOTE Confidence: 0.8194428005
- $00{:}40{:}07.050 \dashrightarrow 00{:}40{:}10.235$  Oh, actually, let's see if this will.
- NOTE Confidence: 0.8194428005
- $00:40:10.240 \longrightarrow 00:40:10.510$  Yeah.
- NOTE Confidence: 0.8194428005
- 00:40:10.510 --> 00:40:10.780 So,
- NOTE Confidence: 0.8194428005
- $00:40:10.780 \longrightarrow 00:40:12.670$  so you see these bands coming across,
- NOTE Confidence: 0.8194428005
- $00:40:12.670 \longrightarrow 00:40:14.662$  those are basically patients that are
- NOTE Confidence: 0.8194428005
- $00{:}40{:}14.662 \dashrightarrow 00{:}40{:}16.927$  progressing and going on to a second
- NOTE Confidence: 0.8194428005
- $00{:}40{:}16.927 \dashrightarrow 00{:}40{:}18.679$  line treatment what's not shown here.
- NOTE Confidence: 0.8194428005
- $00:40:18.680 \longrightarrow 00:40:20.198$  Just to spare you a little

- NOTE Confidence: 0.8194428005
- $00:40:20.198 \longrightarrow 00:40:21.560$  bit on the visual side,
- NOTE Confidence: 0.8194428005
- $00{:}40{:}21{.}560 \dashrightarrow 00{:}40{:}24{.}458$  our patients who are or stopping the rapy
- NOTE Confidence: 0.8194428005
- $00:40:24.458 \rightarrow 00:40:26.490$  and and essentially transitioning to
- NOTE Confidence: 0.8194428005
- 00:40:26.490 --> 00:40:29.362 Hospice or some sort of end of life
- NOTE Confidence: 0.8194428005
- $00:40:29.432 \longrightarrow 00:40:31.777$  care and that's this big bar here.
- NOTE Confidence: 0.8194428005
- $00:40:31.780 \longrightarrow 00:40:34.090$  And then some patients these
- NOTE Confidence: 0.8194428005
- $00:40:34.090 \longrightarrow 00:40:36.350$  little these little ones they're
- NOTE Confidence: 0.8194428005
- $00:40:36.350 \longrightarrow 00:40:38.400$  going to a deescalated regimen.
- NOTE Confidence: 0.8194428005
- $00:40:38.400 \longrightarrow 00:40:40.056$  So they're dropping the.
- NOTE Confidence: 0.8194428005
- $00{:}40{:}40{.}056 \dashrightarrow 00{:}40{:}42{.}540$  Arena taken or the oxaliplatin and
- NOTE Confidence: 0.8194428005
- $00:40:42.611 \rightarrow 00:40:45.299$  so you can really start to see these
- NOTE Confidence: 0.8194428005
- $00{:}40{:}45{.}299 \dashrightarrow 00{:}40{:}48{.}535$  patterns of care in the real world data so.
- NOTE Confidence: 0.8194428005
- $00:40:48.540 \longrightarrow 00:40:49.143$  OK,
- NOTE Confidence: 0.8194428005
- $00{:}40{:}49{.}143 \dashrightarrow 00{:}40{:}49{.}746$  so.
- NOTE Confidence: 0.8194428005
- $00:40:49.746 \rightarrow 00:40:53.967$  This is my little advertisement for Humalog.
- NOTE Confidence: 0.8194428005

 $00:40:53.970 \longrightarrow 00:40:56.194$  It's available to you.

NOTE Confidence: 0.8194428005

 $00{:}40{:}56{.}194 \dashrightarrow 00{:}40{:}58{.}985$  You can you can download the whole

NOTE Confidence: 0.8194428005

 $00{:}40{:}58.985 \dashrightarrow 00{:}41{:}01.472$  thing and and mess around with

NOTE Confidence: 0.8194428005

00:41:01.472 --> 00:41:04.055 it if you're an academic or non

NOTE Confidence: 0.8194428005

 $00{:}41{:}04.055 \dashrightarrow 00{:}41{:}05.887$  commercial user and just Google

NOTE Confidence: 0.8194428005

 $00{:}41{:}05{.}887 \dashrightarrow 00{:}41{:}08{.}869$  Hemac dataverse and you'll find it.

NOTE Confidence: 0.91100581

 $00:41:08.870 \longrightarrow 00:41:11.310$  Or you can you can use these links.

NOTE Confidence: 0.91100581

 $00:41:11.310 \longrightarrow 00:41:13.975$  It's also available through something

NOTE Confidence: 0.91100581

 $00{:}41{:}13.975 \dashrightarrow 00{:}41{:}16.640$  called the Odyssey Athena vocabulary.

NOTE Confidence: 0.91100581

00:41:16.640 --> 00:41:19.980 And and yeah, I mean, we want more users.

NOTE Confidence: 0.91100581

00:41:19.980 --> 00:41:21.510 There's I think a lot more

NOTE Confidence: 0.91100581

 $00:41:21.571 \longrightarrow 00:41:22.957$  that can be done with it.

NOTE Confidence: 0.91100581

 $00:41:22.960 \longrightarrow 00:41:25.940$  So along comes a pandemic.

NOTE Confidence: 0.91100581

 $00:41:25.940 \longrightarrow 00:41:28.793$  So, so now I want to spend the last

NOTE Confidence: 0.91100581

 $00:41:28.793 \longrightarrow 00:41:31.618$  little bit here talking about the

NOTE Confidence: 0.91100581

 $00:41:31.618 \rightarrow 00:41:33.562$  COVID-19 and cancer consortium.

 $00:41:33.570 \longrightarrow 00:41:36.330$  Which yells a member and this

NOTE Confidence: 0.91100581

 $00:41:36.330 \longrightarrow 00:41:38.170$  is our mission statement,

NOTE Confidence: 0.91100581

 $00:41:38.170 \longrightarrow 00:41:40.270$  which has been the same since

NOTE Confidence: 0.91100581

 $00:41:40.270 \rightarrow 00:41:42.549$  we were created in March 2020,

NOTE Confidence: 0.91100581

 $00:41:42.550 \longrightarrow 00:41:44.230$  which is our goal is to collect

NOTE Confidence: 0.91100581

 $00:41:44.230 \longrightarrow 00:41:44.950$  and disseminate prospective,

NOTE Confidence: 0.91100581

00:41:44.950 --> 00:41:46.087 granular, uniformly organized

NOTE Confidence: 0.91100581

 $00:41:46.087 \rightarrow 00:41:47.982$  information on people with cancer

NOTE Confidence: 0.91100581

 $00{:}41{:}47{.}982 \dashrightarrow 00{:}41{:}50{.}075$  who are diagnosed with COVID-19 at

NOTE Confidence: 0.91100581

 $00:41:50.075 \dashrightarrow 00:41:51.995$  scale and as rapidly as possible.

NOTE Confidence: 0.91100581

 $00{:}41{:}52.000 \dashrightarrow 00{:}41{:}53.337$  But what I want to talk about

NOTE Confidence: 0.91100581

00:41:53.337 --> 00:41:55.127 here for a minute is sort of what

NOTE Confidence: 0.91100581

 $00{:}41{:}55{.}127 \dashrightarrow 00{:}41{:}56{.}440$  I call the ancillary goals of

NOTE Confidence: 0.91100581

 $00{:}41{:}56{.}440 \dashrightarrow 00{:}41{:}58{.}630$  C19 or the unwritten goals.

NOTE Confidence: 0.91100581

 $00{:}41{:}58.630 \dashrightarrow 00{:}42{:}00.414$  So one of those was, you know,

 $00:42:00.414 \longrightarrow 00:42:01.974$  can we build a consortium,

NOTE Confidence: 0.91100581

 $00:42:01.980 \rightarrow 00:42:04.636$  can we build an airplane while also flying?

NOTE Confidence: 0.91100581

 $00:42:04.640 \longrightarrow 00:42:05.844$  Just, you know, can we do it?

NOTE Confidence: 0.91100581

 $00:42:05.850 \longrightarrow 00:42:07.202$  That was the question.

NOTE Confidence: 0.91100581

00:42:07.202 --> 00:42:08.892 Convening a group of stakeholders

NOTE Confidence: 0.91100581

00:42:08.892 --> 00:42:10.560 was really in, you know,

NOTE Confidence: 0.91100581

 $00:42:10.560 \longrightarrow 00:42:11.960$  a goal including patients,

NOTE Confidence: 0.91100581

 $00:42:11.960 \rightarrow 00:42:15.260$  really engaging patients and then.

NOTE Confidence: 0.91100581

 $00{:}42{:}15{.}260 \dashrightarrow 00{:}42{:}16{.}900$  Pertinent to the talk today,

NOTE Confidence: 0.91100581

 $00{:}42{:}16{.}900 \dashrightarrow 00{:}42{:}18{.}664$  can we demonstrate the additive value of

NOTE Confidence: 0.91100581

 $00{:}42{:}18.664 \dashrightarrow 00{:}42{:}20.611$  real world data elements that are not

NOTE Confidence: 0.91100581

 $00{:}42{:}20.611$  -->  $00{:}42{:}22.315$  easily obtained from structured EMR data?

NOTE Confidence: 0.91100581

 $00{:}42{:}22{.}320 \dashrightarrow 00{:}42{:}24{.}070$  We knew that there were other efforts

NOTE Confidence: 0.91100581

 $00{:}42{:}24.070 \dashrightarrow 00{:}42{:}25.884$  kind of getting rolling that were based

NOTE Confidence: 0.91100581

 $00{:}42{:}25.884 \dashrightarrow 00{:}42{:}27.700$  on what was in that structured data.

NOTE Confidence: 0.91100581

 $00:42:27.700 \longrightarrow 00:42:31.000$  If you remember that's the.

- NOTE Confidence: 0.91100581
- $00:42:31.000 \rightarrow 00:42:33.874$  The tiny little blue bars right

 $00:42:33.874 \longrightarrow 00:42:37.049$  on the graph I showed you.

NOTE Confidence: 0.91100581

00:42:37.050 --> 00:42:38.346 So we wanted to, you know,

NOTE Confidence: 0.91100581

 $00:42:38.350 \longrightarrow 00:42:43.400$  get more than that. So this is.

NOTE Confidence: 0.91100581

 $00{:}42{:}43{.}400 \dashrightarrow 00{:}42{:}46{.}128$  This is back in back in Rhode Island.

NOTE Confidence: 0.91100581

 $00:42:46.130 \longrightarrow 00:42:46.361$  Alright.

NOTE Confidence: 0.91100581

00:42:46.361 -> 00:42:47.516 Showed you Eli Whitney earlier.

NOTE Confidence: 0.91100581

 $00{:}42{:}47{.}520 \dashrightarrow 00{:}42{:}50{.}362$  This is the this is Slater Mill

NOTE Confidence: 0.91100581

 $00{:}42{:}50{.}362 \dashrightarrow 00{:}42{:}52{.}954$  in Pawtucket which I think I

NOTE Confidence: 0.91100581

00:42:52.954 --> 00:42:54.674 pronounced correctly but I'm

NOTE Confidence: 0.91100581

 $00{:}42{:}54.674 \dashrightarrow 00{:}42{:}57.190$  getting my New England shops.

NOTE Confidence: 0.91100581

 $00{:}42{:}57{.}190 \dashrightarrow 00{:}42{:}59{.}668$  And and what's interesting to me about

NOTE Confidence: 0.91100581

 $00{:}42{:}59.668 \dashrightarrow 00{:}43{:}02.180$  this story is that he earned this name,

NOTE Confidence: 0.91100581

00:43:02.180 --> 00:43:05.030 Samuel Shredder Slater and the

NOTE Confidence: 0.91100581

 $00{:}43{:}05{.}030 \dashrightarrow 00{:}43{:}08{.}220$  reason he was branded as a traitor

 $00:43:08.220 \rightarrow 00:43:11.013$  is that he was accused of stealing

NOTE Confidence: 0.91100581

 $00{:}43{:}11{.}101 \dashrightarrow 00{:}43{:}13{.}817$  the ideas for industrialization.

NOTE Confidence: 0.91100581

 $00:43:13.820 \rightarrow 00:43:16.150$  From from the from the,

NOTE Confidence: 0.91100581

 $00{:}43{:}16.150 \dashrightarrow 00{:}43{:}19.975$  from England where he was born and grew up,

NOTE Confidence: 0.91100581

 $00{:}43{:}19{.}980 \dashrightarrow 00{:}43{:}22{.}470$  and then replicating it in America.

NOTE Confidence: 0.91100581

 $00{:}43{:}22{.}470 \dashrightarrow 00{:}43{:}25{.}200$  So this is really the beginning of

NOTE Confidence: 0.91100581

 $00{:}43{:}25{.}200 \dashrightarrow 00{:}43{:}27{.}180$  the American Industrial Revolution.

NOTE Confidence: 0.91100581

 $00{:}43{:}27.180 \dashrightarrow 00{:}43{:}29.262$  But what's interesting about that is

NOTE Confidence: 0.91100581

 $00{:}43{:}29{.}262 \dashrightarrow 00{:}43{:}31{.}648$  that he didn't exactly steal the ideas.

NOTE Confidence: 0.91100581

00:43:31.650 --> 00:43:33.060 Like he didn't steal blueprints

NOTE Confidence: 0.91100581

 $00:43:33.060 \longrightarrow 00:43:34.188$  or things like that.

NOTE Confidence: 0.91100581

 $00{:}43{:}34{.}190 \dashrightarrow 00{:}43{:}36{.}914$  He just like memorized them and

NOTE Confidence: 0.91100581

 $00{:}43{:}36{.}914 \dashrightarrow 00{:}43{:}39{.}130$  brought the knowledge with him.

NOTE Confidence: 0.91100581

 $00:43:39.130 \rightarrow 00:43:42.064$  So it's, you know, that's that's what he did.

NOTE Confidence: 0.91100581

00:43:42.070 - 00:43:46.198 So. I think that that's great actually.

NOTE Confidence: 0.91100581

 $00:43:46.200 \longrightarrow 00:43:47.719$  And so you know when we think

- NOTE Confidence: 0.91100581
- 00:43:47.719 --> 00:43:49.493 about C 19 and I certainly don't

 $00:43:49.493 \longrightarrow 00:43:51.420$  have time to go through all this,

NOTE Confidence: 0.91100581

 $00:43:51.420 \longrightarrow 00:43:55.158$  but we have many inspirations he,

NOTE Confidence: 0.91100581

 $00:43:55.160 \longrightarrow 00:43:55.672$  the hemlock,

NOTE Confidence: 0.91100581

 $00{:}43{:}55.672 \dashrightarrow 00{:}43{:}58.060$  what I just spoke about is one of them.

NOTE Confidence: 0.91100581

00:43:58.060 - 00:44:01.300 But in all the domains of C19,

NOTE Confidence: 0.91100581

 $00:44:01.300 \longrightarrow 00:44:04.000$  we are borrowing best ideas,

NOTE Confidence: 0.91100581

 $00:44:04.000 \rightarrow 00:44:06.536$  modifying sometimes and putting

NOTE Confidence: 0.91100581

 $00{:}44{:}06{.}536$  -->  $00{:}44{:}09{.}012$  together this consortium and and

NOTE Confidence: 0.91100581

 $00:44:09.012 \longrightarrow 00:44:11.760$  this is just sort of a list of that.

NOTE Confidence: 0.91100581

00:44:11.760 --> 00:44:13.140 The other thing I wanted to

NOTE Confidence: 0.91100581

00:44:13.140 --> 00:44:14.060 say about you know

NOTE Confidence: 0.777663597692308

 $00{:}44{:}14{.}110 \dashrightarrow 00{:}44{:}15{.}466$  the C 19. Work and just,

NOTE Confidence: 0.777663597692308

 $00{:}44{:}15{.}466 \dashrightarrow 00{:}44{:}17{.}501$  you know, research in general

NOTE Confidence: 0.777663597692308

 $00{:}44{:}17.501 \dashrightarrow 00{:}44{:}19.886$  is that sponsors are critical.

00:44:19.890 --> 00:44:21.640 In a Samuel Slater's case,

NOTE Confidence: 0.777663597692308

00:44:21.640 --> 00:44:23.260 he had a sponsor named Moses

NOTE Confidence: 0.777663597692308

00:44:23.260 --> 00:44:24.638 Brown who basically fronted him

NOTE Confidence: 0.777663597692308

 $00:44:24.638 \rightarrow 00:44:26.084$  the money to build those mills.

NOTE Confidence: 0.777663597692308

 $00{:}44{:}26.090 \dashrightarrow 00{:}44{:}28.922$  And our sponsor is Julie Klem at the

NOTE Confidence: 0.777663597692308

 $00{:}44{:}28{.}922 \dashrightarrow 00{:}44{:}32{.}004$  NCI who didn't front us any money but

NOTE Confidence: 0.777663597692308

 $00:44:32.004 \rightarrow 00:44:35.530$  was very supportive and helped us kind of,

NOTE Confidence: 0.777663597692308

 $00:44:35.530 \rightarrow 00:44:38.764$  you know, surface and socialize our ideas.

NOTE Confidence: 0.777663597692308

 $00:44:38.770 \longrightarrow 00:44:40.442$  So this is our.

NOTE Confidence: 0.777663597692308

 $00:44:40.442 \longrightarrow 00:44:42.532$  This is our data schema,

NOTE Confidence: 0.777663597692308

 $00{:}44{:}42{.}540 \dashrightarrow 00{:}44{:}44{.}924$  and what I want to emphasize here related

NOTE Confidence: 0.777663597692308

 $00:44:44.924 \longrightarrow 00:44:47.467$  to this talk is that everything in red.

NOTE Confidence: 0.777663597692308

00:44:47.470 --> 00:44:49.888 Is not available in structured data,

NOTE Confidence: 0.777663597692308

 $00:44:49.890 \longrightarrow 00:44:52.530$  so as we sort of built this up.

NOTE Confidence: 0.777663597692308

 $00:44:52.530 \longrightarrow 00:44:53.066$  You know,

NOTE Confidence: 0.777663597692308

 $00:44:53.066 \rightarrow 00:44:54.942$  some of these things you can collect,

- NOTE Confidence: 0.777663597692308
- 00:44:54.950 --> 00:44:56.408 you know, in many different ways.
- NOTE Confidence: 0.777663597692308
- $00{:}44{:}56{.}410 \dashrightarrow 00{:}44{:}57{.}266$  But the red items.
- NOTE Confidence: 0.777663597692308
- 00:44:57.266 --> 00:44:58.873 And you'll see in a few slides
- NOTE Confidence: 0.777663597692308
- $00:44:58.873 \longrightarrow 00:45:00.763$  that those turn out to be critical
- NOTE Confidence: 0.777663597692308
- $00{:}45{:}00{.}763 \dashrightarrow 00{:}45{:}02{.}580$  things like ECOG performance status,
- NOTE Confidence: 0.777663597692308
- $00:45:02.580 \rightarrow 00:45:05.800$  things like toxicity of
- NOTE Confidence: 0.777663597692308
- $00{:}45{:}05{.}800 \dashrightarrow 00{:}45{:}08{.}215$  cancer treatment pneumonitis.
- NOTE Confidence: 0.777663597692308
- $00:45:08.220 \longrightarrow 00:45:09.129$  Items like that,
- NOTE Confidence: 0.777663597692308
- $00:45:09.129 \rightarrow 00:45:11.500$  that we really wanted to zero in on.
- NOTE Confidence: 0.777663597692308
- 00:45:11.500 --> 00:45:12.466 I'm going to skip this slide.
- NOTE Confidence: 0.777663597692308
- 00:45:12.470 --> 00:45:14.714 I'm going to skip this and
- NOTE Confidence: 0.777663597692308
- $00:45:14.714 \longrightarrow 00:45:17.069$  I'm going to just say that.
- NOTE Confidence: 0.777663597692308
- $00:45:17.070 \rightarrow 00:45:19.023$  We've done really pretty well on capturing
- NOTE Confidence: 0.777663597692308
- $00{:}45{:}19{.}023 \dashrightarrow 00{:}45{:}21{.}090$  what I would call elusive variables.
- NOTE Confidence: 0.777663597692308
- $00:45:21.090 \longrightarrow 00:45:22.842$  So these are kind of the
- NOTE Confidence: 0.777663597692308

 $00:45:22.842 \longrightarrow 00:45:25.166$  things that they're in the ER,

NOTE Confidence: 0.777663597692308

 $00{:}45{:}25{.}166 \dashrightarrow 00{:}45{:}27{.}336$  but they're in that unstructured.

NOTE Confidence: 0.777663597692308

00:45:27.340 --> 00:45:28.276 Leak of data,

NOTE Confidence: 0.777663597692308

 $00:45:28.276 \rightarrow 00:45:30.980$  but we we got a lot of them.

NOTE Confidence: 0.777663597692308

 $00{:}45{:}30{.}980 \dashrightarrow 00{:}45{:}34{.}070$  So cancer status is the patient.

NOTE Confidence: 0.777663597692308

 $00:45:34.070 \longrightarrow 00:45:34.780$  Getting better,

NOTE Confidence: 0.777663597692308

 $00:45:34.780 \longrightarrow 00:45:36.555$  getting worse or staying this,

NOTE Confidence: 0.777663597692308

 $00:45:36.560 \rightarrow 00:45:37.688$  you know the same as before,

NOTE Confidence: 0.777663597692308

00:45:37.690 --> 00:45:38.599 a stable disease.

NOTE Confidence: 0.777663597692308

 $00{:}45{:}38{.}599 \dashrightarrow 00{:}45{:}41{.}372$  We have that in over 95% of the patients.

NOTE Confidence: 0.777663597692308

 $00{:}45{:}41{.}372 \dashrightarrow 00{:}45{:}43{.}929$  Even smoking status is hard to get right.

NOTE Confidence: 0.777663597692308

 $00:45:43.930 \longrightarrow 00:45:45.778$  We have that.

NOTE Confidence: 0.777663597692308

 $00{:}45{:}45{.}780 \dashrightarrow 00{:}45{:}48{.}080$  Did COVID affects the patients

NOTE Confidence: 0.777663597692308

 $00{:}45{:}48.080 \dashrightarrow 00{:}45{:}50.488$  treatment plants that's not going to

NOTE Confidence: 0.777663597692308

 $00{:}45{:}50{.}488 \dashrightarrow 00{:}45{:}51{.}976$  be unstructured data necessarily.

NOTE Confidence: 0.777663597692308

 $00:45:51.980 \longrightarrow 00:45:55.418$  We have over 90% on that on the ECOG

- NOTE Confidence: 0.777663597692308
- $00:45:55.418 \longrightarrow 00:45:57.463$  which is a notorious notoriously
- NOTE Confidence: 0.777663597692308
- $00:45:57.463 \longrightarrow 00:45:59.514$  difficult thing to get and all
- NOTE Confidence: 0.777663597692308
- $00{:}45{:}59{.}514 \dashrightarrow 00{:}46{:}01{.}111$  the various efforts such as flat
- NOTE Confidence: 0.777663597692308
- $00:46:01.111 \longrightarrow 00:46:02.894$  iron and and so forth have had
- NOTE Confidence: 0.777663597692308
- $00{:}46{:}02.894 \dashrightarrow 00{:}46{:}04.414$  had challenging and cancer link
- NOTE Confidence: 0.777663597692308
- $00:46:04.414 \longrightarrow 00:46:05.963$  have had challenges with this.
- NOTE Confidence: 0.777663597692308
- $00:46:05.963 \longrightarrow 00:46:08.626$  We have we have ECOG data on 88%
- NOTE Confidence: 0.777663597692308
- $00{:}46{:}08.626 \dashrightarrow 00{:}46{:}10.256$  although that does that includes
- NOTE Confidence: 0.777663597692308
- 00:46:10.256 --> 00:46:11.882 patients who just didn't have
- NOTE Confidence: 0.777663597692308
- $00:46:11.882 \longrightarrow 00:46:13.484$  any ECOG recorded but we that
- NOTE Confidence: 0.777663597692308
- 00:46:13.484 --> 00:46:15.088 knowledge of no ECOG is still.
- NOTE Confidence: 0.777663597692308
- 00:46:15.090 --> 00:46:16.350 Knowledge,
- NOTE Confidence: 0.777663597692308
- $00:46:16.350 \longrightarrow 00:46:17.610$  right?
- NOTE Confidence: 0.777663597692308
- $00{:}46{:}17.610 \dashrightarrow 00{:}46{:}19.920$  And you know getting to our
- NOTE Confidence: 0.777663597692308
- $00{:}46{:}19{.}920 \dashrightarrow 00{:}46{:}22{.}199$  getting to our results again in
- NOTE Confidence: 0.777663597692308

 $00:46:22.199 \longrightarrow 00:46:24.284$  just focus on the red and what

NOTE Confidence: 0.777663597692308

 $00:46:24.284 \longrightarrow 00:46:25.586$  we found is that these factors,

NOTE Confidence: 0.777663597692308

 $00:46:25.590 \rightarrow 00:46:28.446$  these elusive factors are really important.

NOTE Confidence: 0.777663597692308

 $00:46:28.450 \longrightarrow 00:46:30.680$  And so this is unadjusted

NOTE Confidence: 0.777663597692308

 $00:46:30.680 \longrightarrow 00:46:32.464$  just kind of descriptive.

NOTE Confidence: 0.777663597692308

 $00{:}46{:}32{.}470 \dashrightarrow 00{:}46{:}34{.}582$  If you had progressing cancer at

NOTE Confidence: 0.777663597692308

00:46:34.582 --> 00:46:36.668 baseline you get COVID your 30

NOTE Confidence: 0.777663597692308

 $00:46:36.668 \longrightarrow 00:46:38.746$  day mortality is 26% and if you

NOTE Confidence: 0.777663597692308

 $00:46:38.746 \longrightarrow 00:46:41.390$  had an ECOG of two or higher your

NOTE Confidence: 0.777663597692308

 $00:46:41.390 \rightarrow 00:46:43.090$  your mortality is extremely high.

NOTE Confidence: 0.906268886

 $00{:}46{:}45{.}190 \dashrightarrow 00{:}46{:}48{.}440$  And we also found that immuno suppression

NOTE Confidence: 0.906268886

 $00:46:48.440 \longrightarrow 00:46:52.240$  which is a somewhat nebulous

NOTE Confidence: 0.906268886

 $00{:}46{:}52{.}240 \dashrightarrow 00{:}46{:}54{.}160$  definition and we have our

NOTE Confidence: 0.906268886

 $00:46:54.160 \rightarrow 00:46:56.080$  definition here which is complex,

NOTE Confidence: 0.906268886

 $00{:}46{:}56{.}080 \dashrightarrow 00{:}46{:}58{.}369$  which includes a lot of things you

NOTE Confidence: 0.906268886

 $00:46:58.369 \rightarrow 00:47:00.140$  can't easily get out of structured data.

- NOTE Confidence: 0.906268886
- $00:47:00.140 \longrightarrow 00:47:02.415$  So this is sort of the real
- NOTE Confidence: 0.906268886
- $00:47:02.415 \longrightarrow 00:47:04.417$  world data is a huge,
- NOTE Confidence: 0.906268886
- 00:47:04.420 --> 00:47:07.778 is a huge driver of of mortality.
- NOTE Confidence: 0.906268886
- $00:47:07.778 \longrightarrow 00:47:10.699$  And if you look at the right on the right,
- NOTE Confidence: 0.906268886
- $00:47:10.700 \longrightarrow 00:47:12.245$  the, the yellow table basically
- NOTE Confidence: 0.906268886
- $00:47:12.245 \longrightarrow 00:47:14.289$  those are the patients who are
- NOTE Confidence: 0.906268886
- $00:47:14.289 \rightarrow 00:47:15.609$  immunosuppressed at baseline.
- NOTE Confidence: 0.906268886
- $00{:}47{:}15.610 \dashrightarrow 00{:}47{:}17.282$  And across the board,
- NOTE Confidence: 0.906268886
- $00:47:17.282 \longrightarrow 00:47:18.954$  even younger patients have
- NOTE Confidence: 0.906268886
- $00:47:18.954 \longrightarrow 00:47:20.810$  substantial mortality in our data set.
- NOTE Confidence: 0.862009429
- 00:47:23.530 --> 00:47:25.600 Furthermore, if you add on
- NOTE Confidence: 0.862009429
- $00{:}47{:}25.600 \dashrightarrow 00{:}47{:}27.670$  top of that active cancer.
- NOTE Confidence: 0.862009429
- $00:47:27.670 \longrightarrow 00:47:28.886$  So are they immunosuppressed
- NOTE Confidence: 0.862009429
- $00:47:28.886 \longrightarrow 00:47:30.406$  and they have active cancer.
- NOTE Confidence: 0.862009429
- $00:47:30.410 \longrightarrow 00:47:34.120$  Again, we have our definition for that.
- NOTE Confidence: 0.862009429

 $00:47:34.120 \rightarrow 00:47:35.570$  Because if you're not immunosuppressed

NOTE Confidence: 0.862009429

 $00{:}47{:}35{.}570 \dashrightarrow 00{:}47{:}37{.}020$  and you have inactive cancer,

NOTE Confidence: 0.862009429

 $00:47:37.020 \longrightarrow 00:47:39.100$  in our data, at least you have a

NOTE Confidence: 0.862009429

 $00:47:39.100 \rightarrow 00:47:41.552$  zero chance of dying in the 30 days,

NOTE Confidence: 0.862009429

00:47:41.552 --> 00:47:43.292 whereas if you're older immunosuppressed,

NOTE Confidence: 0.862009429

 $00:47:43.300 \longrightarrow 00:47:44.956$  your chance goes all the way up to 30%.

NOTE Confidence: 0.862009429

 $00:47:44.960 \longrightarrow 00:47:47.384$  So really a huge spread here

NOTE Confidence: 0.862009429

 $00{:}47{:}47{.}384 \dashrightarrow 00{:}47{:}49{.}500$  based on these these data.

NOTE Confidence: 0.862009429

 $00{:}47{:}49.500 \dashrightarrow 00{:}47{:}52.676$  And then if we start to look at.

NOTE Confidence: 0.862009429

 $00:47:52.680 \rightarrow 00:47:54.309$  Multivariable adjusted analysis.

NOTE Confidence: 0.862009429

 $00:47:54.309 \longrightarrow 00:47:57.567$  Again, we see that these factors

NOTE Confidence: 0.862009429

 $00{:}47{:}57{.}567 \dashrightarrow 00{:}48{:}01{.}031$  like ECOG or cancer status are are

NOTE Confidence: 0.862009429

 $00:48:01.031 \rightarrow 00:48:02.923$  highly associated with outcome,

NOTE Confidence: 0.862009429

 $00:48:02.930 \rightarrow 00:48:04.790$  both mortality as well as severity,

NOTE Confidence: 0.862009429

 $00:48:04.790 \longrightarrow 00:48:06.764$  which means hospitalization,

NOTE Confidence: 0.862009429

 $00:48:06.764 \longrightarrow 00:48:09.396$  intubation and so forth.

- NOTE Confidence: 0.862009429
- $00{:}48{:}09{.}400 \dashrightarrow 00{:}48{:}11{.}144$  We saw this as well more recently when
- NOTE Confidence: 0.862009429
- $00:48:11.144 \rightarrow 00:48:12.679$  we looked at vaccinated patients.
- NOTE Confidence: 0.862009429
- 00:48:12.680 --> 00:48:14.765 So patients who are getting
- NOTE Confidence: 0.862009429
- 00:48:14.765 --> 00:48:16.433 breakthrough COVID-19 after vaccine
- NOTE Confidence: 0.862009429
- $00:48:16.433 \rightarrow 00:48:18.543$  again we saw things like cancer
- NOTE Confidence: 0.862009429
- 00:48:18.543 --> 00:48:20.360 status really you know being a,
- NOTE Confidence: 0.862009429
- 00:48:20.360 --> 00:48:22.508 you know huge adjusted odds ratio
- NOTE Confidence: 0.862009429
- $00{:}48{:}22.508 \dashrightarrow 00{:}48{:}26.101$  there of six if you had an active and
- NOTE Confidence: 0.862009429
- $00:48:26.101 \rightarrow 00:48:28.578$  progressing cancer of dying in 30 days.
- NOTE Confidence: 0.728421021666667
- 00:48:31.380 --> 00:48:33.480 So I could talk about COVID
- NOTE Confidence: 0.728421021666667
- 00:48:33.480 --> 00:48:34.660 C19 itself for an hour,
- NOTE Confidence: 0.728421021666667
- $00{:}48{:}34{.}660 \dashrightarrow 00{:}48{:}37{.}540$  but I'm going to pause and so I just
- NOTE Confidence: 0.728421021666667
- $00{:}48{:}37{.}540 \dashrightarrow 00{:}48{:}40{.}359$  want to share some parting thoughts.
- NOTE Confidence: 0.728421021666667
- 00:48:40.360 --> 00:48:42.558 So, first of all, I think I'm,
- NOTE Confidence: 0.728421021666667
- 00:48:42.560 --> 00:48:43.964 I'm a, you know, I'm, I'm,
- NOTE Confidence: 0.728421021666667

 $00:48:43.964 \longrightarrow 00:48:45.728$  I'm a believer here that real

NOTE Confidence: 0.728421021666667

00:48:45.728 --> 00:48:47.795 world data has a great potential

NOTE Confidence: 0.728421021666667

00:48:47.795 --> 00:48:49.670 to yield real-world evidence if.

NOTE Confidence: 0.728421021666667

 $00:48:49.670 \longrightarrow 00:48:51.362$  We approach it with an understanding

NOTE Confidence: 0.728421021666667

 $00:48:51.362 \rightarrow 00:48:52.490$  about the completeness issues,

NOTE Confidence: 0.728421021666667

 $00{:}48{:}52{.}490 \dashrightarrow 00{:}48{:}53{.}591$  the accuracy issues,

NOTE Confidence: 0.728421021666667

 $00{:}48{:}53{.}591 \dashrightarrow 00{:}48{:}56{.}160$  and we anticipate them and we come

NOTE Confidence: 0.728421021666667

 $00:48:56.231 \rightarrow 00:48:58.359$  up with either ways to adjust for

NOTE Confidence: 0.728421021666667

 $00:48:58.359 \longrightarrow 00:49:01.870$  them or or avoid certain data,

NOTE Confidence: 0.728421021666667

 $00{:}49{:}01{.}870 \dashrightarrow 00{:}49{:}04{.}846$  certain variables in the first place.

NOTE Confidence: 0.728421021666667

 $00{:}49{:}04{.}850 \dashrightarrow 00{:}49{:}07{.}130$  We need a so.

NOTE Confidence: 0.728421021666667

 $00:49:07.130 \rightarrow 00:49:09.160$  Yes, we need automated methods, right?

NOTE Confidence: 0.728421021666667

 $00:49:09.160 \longrightarrow 00:49:10.700$  Like, it wouldn't be great if NLP

NOTE Confidence: 0.728421021666667

 $00{:}49{:}10.700 \dashrightarrow 00{:}49{:}12.329$  and a computer could do everything,

NOTE Confidence: 0.728421021666667

 $00:49:12.330 \longrightarrow 00:49:14.330$  but in reality a lot of real world

NOTE Confidence: 0.728421021666667

 $00:49:14.330 \longrightarrow 00:49:15.977$  data and real world evidence

- NOTE Confidence: 0.728421021666667
- 00:49:15.977 --> 00:49:17.787 depends on human curators going
- NOTE Confidence: 0.728421021666667
- 00:49:17.787 --> 00:49:20.050 into EHR's pulling out that data.
- NOTE Confidence: 0.728421021666667
- $00{:}49{:}20.050 \dashrightarrow 00{:}49{:}22.874$  And to do that we need rigorous approaches.
- NOTE Confidence: 0.728421021666667
- $00{:}49{:}22.880 \dashrightarrow 00{:}49{:}24.650$  We have a paper published earlier
- NOTE Confidence: 0.728421021666667
- $00{:}49{:}24.650 \dashrightarrow 00{:}49{:}26.145$  this year describing the approach
- NOTE Confidence: 0.728421021666667
- $00:49:26.145 \longrightarrow 00:49:27.420$  we used in ACR Genie.
- NOTE Confidence: 0.728421021666667
- $00:49:27.420 \longrightarrow 00:49:28.736$  I encourage you to check that out.
- NOTE Confidence: 0.728421021666667
- $00:49:28.740 \longrightarrow 00:49:30.604$  It basically gets into.
- NOTE Confidence: 0.728421021666667
- $00:49:30.604 \longrightarrow 00:49:32.934$  You know you need directives.
- NOTE Confidence: 0.728421021666667
- 00:49:32.940 --> 00:49:35.370 You need you need two people
- NOTE Confidence: 0.728421021666667
- $00:49:35.370 \longrightarrow 00:49:37.396$  to to independently curate the
- NOTE Confidence: 0.728421021666667
- $00{:}49{:}37{.}396 \dashrightarrow 00{:}49{:}39{.}664$  same record at a certain rate so
- NOTE Confidence: 0.728421021666667
- $00:49:39.664 \longrightarrow 00:49:42.848$  you can see if you know there's
- NOTE Confidence: 0.728421021666667
- $00{:}49{:}42.848 \dashrightarrow 00{:}49{:}44.812$  comparability between their results.
- NOTE Confidence: 0.728421021666667
- $00:49:44.820 \longrightarrow 00:49:46.119$  And so forth.
- NOTE Confidence: 0.728421021666667

 $00:49:46.119 \longrightarrow 00:49:48.284$  If if there's widespread adoption

NOTE Confidence: 0.728421021666667

00:49:48.284 --> 00:49:50.310 of standards such as M code,

NOTE Confidence: 0.728421021666667

00:49:50.310 --> 00:49:51.770 hemac, omop and so forth,

NOTE Confidence: 0.728421021666667

 $00{:}49{:}51{.}770 \dashrightarrow 00{:}49{:}54{.}194$  that that will increase the usefulness

NOTE Confidence: 0.728421021666667

 $00:49:54.194 \rightarrow 00:49:56.556$  of structured data margin markedly.

NOTE Confidence: 0.728421021666667

 $00{:}49{:}56{.}556{\:}-{:}{>}00{:}50{:}00{.}567$  I think NLP is having a moment.

NOTE Confidence: 0.728421021666667

 $00:50:00.570 \rightarrow 00:50:03.370$  If you pick up the newspaper nowadays,

NOTE Confidence: 0.728421021666667

 $00:50:03.370 \rightarrow 00:50:05.404$  like you're going to see our other paper on,

NOTE Confidence: 0.728421021666667

 $00{:}50{:}05{.}410 \dashrightarrow 00{:}50{:}06{.}674$  you're going to see an article on chat,

NOTE Confidence: 0.728421021666667

00:50:06.680 --> 00:50:08.048 GPT, for example,

NOTE Confidence: 0.728421021666667

 $00{:}50{:}08.048 \dashrightarrow 00{:}50{:}11.240$  which is generative NLP but sort of

NOTE Confidence: 0.728421021666667

00:50:11.327 - 00:50:16.409 the other side of NLP, and then Umm.

NOTE Confidence: 0.728421021666667

 $00{:}50{:}16.410 \dashrightarrow 00{:}50{:}17.730$  You know, really important though,

NOTE Confidence: 0.728421021666667

 $00{:}50{:}17.730 \dashrightarrow 00{:}50{:}19.584$  and I didn't get to touch on this at

NOTE Confidence: 0.728421021666667

 $00:50:19.584 \rightarrow 00:50:21.681$  all except for the very beginning when

NOTE Confidence: 0.728421021666667

 $00:50:21.681 \rightarrow 00:50:23.420$  I alluded to disparities and bias.

- NOTE Confidence: 0.728421021666667
- $00:50:23.420 \longrightarrow 00:50:25.928$  There's a lot of concern that.
- NOTE Confidence: 0.728421021666667
- 00:50:25.930 --> 00:50:26.343 That,
- NOTE Confidence: 0.728421021666667
- 00:50:26.343 --> 00:50:27.169 you know,
- NOTE Confidence: 0.728421021666667
- $00:50:27.169 \rightarrow 00:50:29.234$  working with real-world data might
- NOTE Confidence: 0.728421021666667
- $00:50:29.234 \rightarrow 00:50:31.552$  might actually make biases worse that
- NOTE Confidence: 0.728421021666667
- $00{:}50{:}31{.}552 \dashrightarrow 00{:}50{:}33{.}688$  are already present in that data.
- NOTE Confidence: 0.728421021666667
- $00:50:33.690 \longrightarrow 00:50:37.554$  So we need new approaches to to to.
- NOTE Confidence: 0.728421021666667
- $00:50:37.560 \rightarrow 00:50:40.899$  New approaches to deal with that issue.
- NOTE Confidence: 0.728421021666667
- $00{:}50{:}40{.}900 \dashrightarrow 00{:}50{:}42{.}220$  Just have some acknowledgements here.
- NOTE Confidence: 0.728421021666667
- $00:50:42.220 \longrightarrow 00:50:43.400$  So there's two slides here.
- NOTE Confidence: 0.728421021666667
- $00:50:43.400 \rightarrow 00:50:44.877$  So this is my first acknowledgement slide.
- NOTE Confidence: 0.728421021666667
- 00:50:44.880 --> 00:50:47.400 I acknowledge the himanka.org
- NOTE Confidence: 0.728421021666667
- $00:50:47.400 \longrightarrow 00:50:48.660$  editorial board.
- NOTE Confidence: 0.728421021666667
- $00{:}50{:}48.660 \dashrightarrow 00{:}50{:}50{.}310$  Others that have worked on
- NOTE Confidence: 0.728421021666667
- $00:50:50.310 \longrightarrow 00:50:52.440$  it are funding and and Dolly,
- NOTE Confidence: 0.728421021666667

 $00:50:52.440 \longrightarrow 00:50:54.126$  which is the creator of some

NOTE Confidence: 0.728421021666667

 $00:50:54.126 \longrightarrow 00:50:55.540$  of those graphics you saw.

NOTE Confidence: 0.728421021666667

 $00:50:55.540 \rightarrow 00:50:58.123$  And here's our acknowledgement for the C19,

NOTE Confidence: 0.728421021666667

 $00:50:58.123 \rightarrow 00:51:02.482$  which is a huge endeavor that has more

NOTE Confidence: 0.728421021666667

 $00:51:02.482 \longrightarrow 00:51:06.080$  than 600 active investigators at this point.

NOTE Confidence: 0.728421021666667

 $00{:}51{:}06{.}080 \dashrightarrow 00{:}51{:}07{.}124$  And with that,

NOTE Confidence: 0.728421021666667

00:51:07.124 --> 00:51:08.864 I will pause for questions.

NOTE Confidence: 0.7881931

00:51:16.340 --> 00:51:21.158 So I'll I'll start. And can you see

NOTE Confidence: 0.7881931

 $00:51:21.158 \longrightarrow 00:51:22.500$  the ones that are online or not?

NOTE Confidence: 0.635115704

00:51:22.770 --> 00:51:27.300 I do see, yes, yes, I see.

NOTE Confidence: 0.785123106956522

 $00:51:27.300 \longrightarrow 00:51:29.964$  So I I, I don't for a second dispute

NOTE Confidence: 0.785123106956522

 $00{:}51{:}29{.}964 \dashrightarrow 00{:}51{:}32{.}779$  the value of real world data in terms

NOTE Confidence: 0.785123106956522

 $00:51:32.779 \rightarrow 00:51:35.388$  of being able to answer questions,

NOTE Confidence: 0.785123106956522

 $00{:}51{:}35{.}390 \dashrightarrow 00{:}51{:}38{.}510$  but I'm struck by the fact that we

NOTE Confidence: 0.785123106956522

 $00:51:38.510 \dashrightarrow 00:51:41.199$  have these two extremes we have.

NOTE Confidence: 0.785123106956522

 $00:51:41.200 \rightarrow 00:51:43.412$  Randomized controlled trials where

 $00{:}51{:}43{.}412 \dashrightarrow 00{:}51{:}47{.}198$  we spend a fortune to collect every

NOTE Confidence: 0.785123106956522

00:51:47.198 --> 00:51:51.808 last bit of data and you know they

NOTE Confidence: 0.785123106956522

 $00{:}51{:}51{.}808 \dashrightarrow 00{:}51{:}56{.}490$  cost \$15,000 per patient or more.

NOTE Confidence: 0.785123106956522

 $00:51:56.490 \dashrightarrow 00:51:59.058$  And we get lots of useless data as

NOTE Confidence: 0.785123106956522

 $00{:}51{:}59{.}058 \dashrightarrow 00{:}52{:}01{.}830$  part of it. And then we then say,

NOTE Confidence: 0.785123106956522

 $00:52:01.830 \rightarrow 00:52:04.494$  well, we can't do get everything

NOTE Confidence: 0.785123106956522

 $00:52:04.494 \rightarrow 00:52:06.270$  from randomized controlled trials.

NOTE Confidence: 0.785123106956522

 $00:52:06.270 \longrightarrow 00:52:08.566$  So then we go to real world data

NOTE Confidence: 0.785123106956522

 $00{:}52{:}08{.}566 \dashrightarrow 00{:}52{:}09{.}856$  where everything's pretty messy

NOTE Confidence: 0.785123106956522

 $00:52:09.856 \longrightarrow 00:52:12.180$  and you have to make all these

NOTE Confidence: 0.785123106956522

 $00:52:12.249 \rightarrow 00:52:14.265$  assumptions and clean up the data.

NOTE Confidence: 0.785123106956522

 $00:52:14.270 \longrightarrow 00:52:16.710$  And the the question is,

NOTE Confidence: 0.785123106956522

 $00{:}52{:}16.710 \dashrightarrow 00{:}52{:}21.603$  is there a role for much simpler randomized

NOTE Confidence: 0.785123106956522

00:52:21.603 --> 00:52:25.880 trials done as part of standard?

NOTE Confidence: 0.785123106956522

 $00:52:25.880 \rightarrow 00:52:26.790$  Practice.

00:52:28.940 --> 00:52:30.000 I mean sure, yeah,

NOTE Confidence: 0.839671244545455

 $00{:}52{:}30{.}000 \dashrightarrow 00{:}52{:}32{.}000$  I mean I think the recovery trial,

NOTE Confidence: 0.839671244545455

 $00{:}52{:}32{.}000 \dashrightarrow 00{:}52{:}34{.}440$  I mean that they they showed that you

NOTE Confidence: 0.839671244545455

 $00:52:34.440 \rightarrow 00:52:36.784$  can do these huge pragmatic trials

NOTE Confidence: 0.839671244545455

 $00{:}52{:}36{.}784 \dashrightarrow 00{:}52{:}39{.}678$  in 10s of thousands of patients with

NOTE Confidence: 0.839671244545455

 $00:52:39.680 \rightarrow 00:52:40.919$  they didn't spend a lot of money.

NOTE Confidence: 0.839671244545455

 $00:52:40.920 \longrightarrow 00:52:42.696$  I mean they used off the shelf drugs,

NOTE Confidence: 0.839671244545455

00:52:42.700 --> 00:52:45.780 right, dexamethason you know things.

NOTE Confidence: 0.839671244545455

 $00:52:45.780 \longrightarrow 00:52:46.818$  Some of the drugs we won't,

NOTE Confidence: 0.839671244545455

 $00:52:46.820 \longrightarrow 00:52:48.472$  we won't say the words but you

NOTE Confidence: 0.839671244545455

 $00{:}52{:}48{.}472 \dashrightarrow 00{:}52{:}50{.}159$  know and things like oxygen right.

NOTE Confidence: 0.839671244545455

00:52:50.160 - 00:52:51.707 But when you get into the you

NOTE Confidence: 0.839671244545455

 $00{:}52{:}51{.}707 \dashrightarrow 00{:}52{:}52{.}894$  know the expensive drugs that

NOTE Confidence: 0.839671244545455

00:52:52.894 --> 00:52:54.079 are not yet FDA approved,

NOTE Confidence: 0.839671244545455

 $00{:}52{:}54{.}080 \dashrightarrow 00{:}52{:}57{.}480$  I think that's a whole other area but.

NOTE Confidence: 0.839671244545455

 $00{:}52{:}57{.}480 \dashrightarrow 00{:}52{:}59{.}730$  I I think that FDA has got to lead

- NOTE Confidence: 0.839671244545455
- $00:52:59.730 \rightarrow 00:53:02.224$  the way in some ways here because they
- NOTE Confidence: 0.839671244545455
- $00:53:02.224 \rightarrow 00:53:04.737$  and I didn't get to talk about this,
- NOTE Confidence: 0.839671244545455
- $00:53:04.740 \longrightarrow 00:53:05.808$  but you know,
- NOTE Confidence: 0.839671244545455
- $00:53:05.808 \rightarrow 00:53:07.588$  there's a high profile rejection
- NOTE Confidence: 0.839671244545455
- $00{:}53{:}07{.}588 \dashrightarrow 00{:}53{:}09{.}230$  of real-world data within the
- NOTE Confidence: 0.839671244545455
- $00{:}53{:}09{.}230 \dashrightarrow 00{:}53{:}10.675$  last month or two that.
- NOTE Confidence: 0.839671244545455
- 00:53:10.680 --> 00:53:11.062 You know,
- NOTE Confidence: 0.839671244545455
- $00:53:11.062 \rightarrow 00:53:12.399$  there was an attempt to get something
- NOTE Confidence: 0.839671244545455
- $00:53:12.399 \rightarrow 00:53:13.657$  approved based on some real-world data.
- NOTE Confidence: 0.839671244545455
- $00:53:13.660 \rightarrow 00:53:15.196$  And I think they rightly looked at that
- NOTE Confidence: 0.839671244545455
- $00:53:15.196 \rightarrow 00:53:16.523$  and they said that this particular
- NOTE Confidence: 0.839671244545455
- 00:53:16.523 --> 00:53:17.867 set of data is not trustworthy
- NOTE Confidence: 0.839671244545455
- $00:53:17.915 \longrightarrow 00:53:19.235$  and we're not going to go for it.
- NOTE Confidence: 0.839671244545455
- 00:53:19.240 --> 00:53:21.095 But I don't think that that should
- NOTE Confidence: 0.839671244545455
- 00:53:21.095 00:53:22.780 shut down the whole endeavor.
- NOTE Confidence: 0.839671244545455

 $00:53:22.780 \longrightarrow 00:53:23.840$  I think that they need,

NOTE Confidence: 0.839671244545455

 $00:53:23.840 \longrightarrow 00:53:24.482$  they need,

NOTE Confidence: 0.839671244545455

 $00:53:24.482 \longrightarrow 00:53:26.408$  we need guidance from them and

NOTE Confidence: 0.839671244545455

 $00:53:26.408 \longrightarrow 00:53:28.591$  and and you know about what

NOTE Confidence: 0.839671244545455

 $00{:}53{:}28{.}591 \dashrightarrow 00{:}53{:}30{.}793$  components should and should not be,

NOTE Confidence: 0.839671244545455

 $00{:}53{:}30{.}800 \dashrightarrow 00{:}53{:}32{.}016$  you know, collected routinely.

NOTE Confidence: 0.839671244545455

 $00{:}53{:}32.016 \dashrightarrow 00{:}53{:}34.169$  I think that might simplify things a lot.

NOTE Confidence: 0.746431946928571

 $00{:}53{:}35{.}570 \dashrightarrow 00{:}53{:}38{.}270$  Attempt to put together criteria that

NOTE Confidence: 0.746431946928571

 $00:53:38.270 \rightarrow 00:53:41.470$  that would allow you to say that this.

NOTE Confidence: 0.746431946928571

 $00{:}53{:}41{.}470 \dashrightarrow 00{:}53{:}44{.}078$  This set of real world data is adequate

NOTE Confidence: 0.746431946928571

00:53:44.078 --> 00:53:46.507 to Brock inclusions from you know,

NOTE Confidence: 0.746431946928571

 $00:53:46.510 \rightarrow 00:53:49.350$  in terms of how much it has to be cleaned up,

NOTE Confidence: 0.746431946928571

 $00{:}53{:}49{.}350 \dashrightarrow 00{:}53{:}51{.}710$  how large the sample size has to be.

NOTE Confidence: 0.90763503

00:53:53.730 --> 00:53:57.960 I think. It it's such an interesting

NOTE Confidence: 0.90763503

 $00{:}53{:}57{.}960 \dashrightarrow 00{:}54{:}00{.}561$  question and I'm I'm not aware of of

NOTE Confidence: 0.90763503

 $00{:}54{:}00{.}561 \dashrightarrow 00{:}54{:}02{.}934$  anything at this moment but I do you

 $00:54:02.934 \rightarrow 00:54:05.178$  know we are there's this great bias

NOTE Confidence: 0.90763503

00:54:05.178 --> 00:54:07.684 that I just learned about called the

NOTE Confidence: 0.90763503

 $00{:}54{:}07{.}684$  -->  $00{:}54{:}09{.}654$  informed presence bias which I kind of NOTE Confidence: 0.90763503

 $00{:}54{:}09{.}654 \dashrightarrow 00{:}54{:}12{.}197$  knew I knew it but not by those words NOTE Confidence: 0.90763503

 $00{:}54{:}12{.}197 \dashrightarrow 00{:}54{:}14{.}108$  but that basically means that patients NOTE Confidence: 0.90763503

 $00:54:14.108 \rightarrow 00:54:16.700$  who spend a lot of time in the clinic

NOTE Confidence: 0.90763503

00:54:16.770 --> 00:54:19.362 or the medical system have a lot of data

NOTE Confidence: 0.90763503

 $00{:}54{:}19{.}362 \dashrightarrow 00{:}54{:}21{.}319$  right whereas those that don't don't

NOTE Confidence: 0.90763503

 $00{:}54{:}21{.}319$  -->  $00{:}54{:}23{.}940$  and and and it's and and it's actually

NOTE Confidence: 0.90763503

 $00:54:23.940 \rightarrow 00:54:25.640$  an incredibly important source of.

NOTE Confidence: 0.90763503

 $00:54:25.640 \longrightarrow 00:54:30.050$  The bias? That. That.

NOTE Confidence: 0.90763503

 $00:54:30.050 \longrightarrow 00:54:31.162$  You know, can you?

NOTE Confidence: 0.90763503

 $00{:}54{:}31{.}162 \dashrightarrow 00{:}54{:}33{.}231$  So if a patient doesn't spend enough

NOTE Confidence: 0.90763503

 $00{:}54{:}33{.}231 \dashrightarrow 00{:}54{:}35{.}265$  time to get enough data generated,

NOTE Confidence: 0.90763503

 $00:54:35.270 \dashrightarrow 00:54:36.600$  that's something we should know.

00:54:36.600 --> 00:54:37.895 That's something we need to know, right?

NOTE Confidence: 0.90763503

00:54:37.895 --> 00:54:40.025 But that's almost that kind of,

NOTE Confidence: 0.90763503

00:54:40.030 - 00:54:41.515 you know, descriptor is almost

NOTE Confidence: 0.90763503

 $00:54:41.515 \rightarrow 00:54:43.630$  never available in in any real world

NOTE Confidence: 0.90763503

 $00:54:43.630 \rightarrow 00:54:45.320$  data study to my knowledge, so.

NOTE Confidence: 0.394810793333333

 $00{:}54{:}46{.}840 \dashrightarrow 00{:}54{:}47{.}779$  The online version.

NOTE Confidence: 0.9350764

 $00{:}54{:}52{.}750 \dashrightarrow 00{:}54{:}53{.}000$  Yeah.

NOTE Confidence: 0.031019479

 $00:55:06.820 \rightarrow 00:55:07.450$  Schedule.

NOTE Confidence: 0.82457125

 $00{:}55{:}10.680 \dashrightarrow 00{:}55{:}11.160$  What is?

NOTE Confidence: 0.839222

 $00:55:16.020 \longrightarrow 00:55:16.430$  COVID-19.

NOTE Confidence: 0.84858656

 $00:55:28.240 \longrightarrow 00:55:31.640$  Yeah. Yeah. So the question is,

NOTE Confidence: 0.84858656

 $00:55:31.640 \longrightarrow 00:55:34.400$  it seems to be the case that the

NOTE Confidence: 0.84858656

 $00:55:34.400 \rightarrow 00:55:36.650$  patients with the pre-existing cancer

NOTE Confidence: 0.84858656

 $00:55:36.650 \rightarrow 00:55:39.620$  having worse outcomes during the COVID

NOTE Confidence: 0.84858656

 $00:55:39.620 \longrightarrow 00:55:42.738$  era than before and why might that be?

NOTE Confidence: 0.84858656

 $00:55:42.740 \rightarrow 00:55:44.444$  I can say from our consortium now we

- NOTE Confidence: 0.84858656
- $00:55:44.444 \rightarrow 00:55:46.116$  only look at patients who had COVID.
- NOTE Confidence: 0.84858656
- $00:55:46.120 \longrightarrow 00:55:47.440$  So that's a subset, right?
- NOTE Confidence: 0.84858656
- $00:55:47.440 \rightarrow 00:55:48.640$  Well, as time goes on,
- NOTE Confidence: 0.84858656
- $00:55:48.640 \rightarrow 00:55:50.176$  it's going to be everybody maybe.
- NOTE Confidence: 0.84858656
- $00:55:50.180 \longrightarrow 00:55:52.740$  But what we do see is that you know at
- NOTE Confidence: 0.84858656
- $00{:}55{:}52{.}813 \dashrightarrow 00{:}55{:}55{.}264$  least in our registry 40% of patients
- NOTE Confidence: 0.84858656
- $00{:}55{:}55{.}264 \dashrightarrow 00{:}55{:}57{.}174$  have their treatment altered in
- NOTE Confidence: 0.84858656
- $00:55:57.174 \rightarrow 00:55:59.958$  some way and usually that's a delay.
- NOTE Confidence: 0.84858656
- $00{:}55{:}59{.}960 \dashrightarrow 00{:}56{:}02{.}012$  But sometimes they can't get the
- NOTE Confidence: 0.84858656
- $00:56:02.012 \rightarrow 00:56:04.210$  same treatment that they were getting
- NOTE Confidence: 0.84858656
- $00{:}56{:}04{.}210 \dashrightarrow 00{:}56{:}06{.}135$  before a surgery gets cancelled,
- NOTE Confidence: 0.84858656
- $00{:}56{:}06{.}140 \dashrightarrow 00{:}56{:}07{.}528$  you know etcetera, etcetera.
- NOTE Confidence: 0.84858656
- 00:56:07.528 --> 00:56:10.918 And and we know from you know previous work,
- NOTE Confidence: 0.84858656
- $00{:}56{:}10.920 \dashrightarrow 00{:}56{:}12.870$  obviously the treatment delays don't
- NOTE Confidence: 0.84858656
- $00:56:12.870 \longrightarrow 00:56:15.318$  usually ever. Work out very well.
- NOTE Confidence: 0.84858656

 $00:56:15.318 \rightarrow 00:56:17.403$  So we haven't yet systematically

NOTE Confidence: 0.84858656

 $00:56:17.403 \longrightarrow 00:56:18.230$  evaluated that,

NOTE Confidence: 0.84858656

 $00:56:18.230 \longrightarrow 00:56:20.036$  but we have you know now several

NOTE Confidence: 0.84858656

 $00:56:20.036 \rightarrow 00:56:21.320$  thousands of those patients.

NOTE Confidence: 0.84858656

 $00{:}56{:}21{.}320 \dashrightarrow 00{:}56{:}22{.}874$  So we're going to be looking at

NOTE Confidence: 0.84858656

 $00:56:22.874 \rightarrow 00:56:24.428$  that probably in the upcoming year.

NOTE Confidence: 0.84858656

 $00:56:24.430 \longrightarrow 00:56:27.490$  As far as other patients, well,

NOTE Confidence: 0.84858656

 $00{:}56{:}27{.}490 \dashrightarrow 00{:}56{:}29{.}830$  I mean and there were a lot of practice

NOTE Confidence: 0.84858656

 $00{:}56{:}29{.}888 \dashrightarrow 00{:}56{:}33{.}809$  changes, right, especially in.

NOTE Confidence: 0.84858656

00:56:33.810 --> 00:56:35.110 Especially in China, I think,

NOTE Confidence: 0.84858656

 $00{:}56{:}35{.}110 \dashrightarrow 00{:}56{:}37{.}918$  but also with sort of substituting

NOTE Confidence: 0.84858656

 $00{:}56{:}37{.}918 \dashrightarrow 00{:}56{:}39{.}790$  or al medications whenever possible,

NOTE Confidence: 0.84858656

 $00:56:39.790 \longrightarrow 00:56:41.755$  even if they were sort of known

NOTE Confidence: 0.84858656

00:56:41.755 --> 00:56:44.056 to be inferior or not, you know,

NOTE Confidence: 0.84858656

 $00:56:44.056 \rightarrow 00:56:45.722$  not quite as good so that patients

NOTE Confidence: 0.84858656

 $00:56:45.722 \rightarrow 00:56:47.036$  didn't have to come into the.

- NOTE Confidence: 0.84858656
- $00{:}56{:}47.040 \dashrightarrow 00{:}56{:}48.060$  To the clinic.
- NOTE Confidence: 0.84858656
- $00:56:48.060 \longrightarrow 00:56:50.100$  So that's been presented on in
- NOTE Confidence: 0.84858656
- $00:56:50.100 \rightarrow 00:56:51.718$  in in some settings,
- NOTE Confidence: 0.84858656
- $00{:}56{:}51{.}720 \dashrightarrow 00{:}56{:}53{.}943$  but you know I think what we think that
- NOTE Confidence: 0.84858656
- $00:56:53.943 \rightarrow 00:56:56.178$  those substitutions are are generally OK,
- NOTE Confidence: 0.84858656
- $00{:}56{:}56{.}180 \dashrightarrow 00{:}56{:}58{.}310$  I know that.
- NOTE Confidence: 0.84858656
- $00{:}56{:}58{.}310 \dashrightarrow 00{:}57{:}00{.}902$  You know a lot of people went on
- NOTE Confidence: 0.84858656
- $00:57:00.902 \rightarrow 00:57:02.202$  neoadjuvant hormone therapy and
- NOTE Confidence: 0.84858656
- 00:57:02.202 --> 00:57:04.146 instead of going direct to surgery
- NOTE Confidence: 0.84858656
- $00:57:04.146 \rightarrow 00:57:05.956$  for early stage breast cancer and
- NOTE Confidence: 0.84858656
- $00:57:05.956 \longrightarrow 00:57:08.021$  you know so that they could push
- NOTE Confidence: 0.84858656
- $00{:}57{:}08{.}021 \dashrightarrow 00{:}57{:}10{.}051$  this you know during periods of time
- NOTE Confidence: 0.84858656
- 00:57:10.051 --> 00:57:11.970 when when elective quote UN quote
- NOTE Confidence: 0.84858656
- 00:57:11.970 --> 00:57:13.590 elective surgeries were shut down.
- NOTE Confidence: 0.84858656
- $00:57:13.590 \rightarrow 00:57:17.070$  So all those things probably add up right.
- NOTE Confidence: 0.84858656

 $00:57:17.070 \rightarrow 00:57:19.180$  But there's but there's absolutely

NOTE Confidence: 0.84858656

 $00:57:19.180 \longrightarrow 00:57:21.713$  a factor of psychology and patients

NOTE Confidence: 0.84858656

 $00:57:21.713 \longrightarrow 00:57:24.239$  being a fraid to come into the

NOTE Confidence: 0.84858656

00:57:24.239 --> 00:57:26.333 clinic and you know potentially

NOTE Confidence: 0.84858656

 $00{:}57{:}26{.}333 \dashrightarrow 00{:}57{:}29{.}099$  again skipping a a treatment or.

NOTE Confidence: 0.84858656

00:57:29.100 --> 00:57:29.404 So,

NOTE Confidence: 0.84858656

 $00{:}57{:}29{.}404 \dashrightarrow 00{:}57{:}30{.}316$  so I think.

NOTE Confidence: 0.84858656

 $00:57:30.316 \longrightarrow 00:57:32.602$  To answer your question is that it's

NOTE Confidence: 0.84858656

 $00{:}57{:}32{.}602 \dashrightarrow 00{:}57{:}35{.}336$  quite complex but I think we need to

NOTE Confidence: 0.84858656

 $00{:}57{:}35{.}336 \dashrightarrow 00{:}57{:}37{.}504$  understand it better and of course

NOTE Confidence: 0.84858656

 $00:57:37.504 \rightarrow 00:57:39.874$  new diagnosis coming in which we're

NOTE Confidence: 0.84858656

 $00:57:39.874 \rightarrow 00:57:42.200$  starting to get that information.

NOTE Confidence: 0.84858656

 $00:57:42.200 \rightarrow 00:57:44.027$  There's clearly a stage migration and and

NOTE Confidence: 0.84858656

 $00{:}57{:}44.027 \dashrightarrow 00{:}57{:}46.398$  you know to later stage more more advanced,

NOTE Confidence: 0.84858656

00:57:46.400 --> 00:57:47.534 more metastatic disease.

NOTE Confidence: 0.84858656

 $00:57:47.534 \rightarrow 00:57:50.610$  Because of delays in screening and so forth.

 $00:57:50.610 \longrightarrow 00:57:50.867$  So.

NOTE Confidence: 0.84858656

 $00:57:50.867 \longrightarrow 00:57:52.923$  So I think we're going to face a

NOTE Confidence: 0.84858656

 $00:57:52.930 \rightarrow 00:57:54.052$  we're going to face a challenging

NOTE Confidence: 0.84858656

 $00{:}57{:}54.052 \dashrightarrow 00{:}57{:}55.624$  decade and I you know I think Ned

NOTE Confidence: 0.84858656

 $00{:}57{:}55{.}624 \dashrightarrow 00{:}57{:}56{.}599$  Sharpless forecast that at the

NOTE Confidence: 0.84858656

 $00{:}57{:}56{.}599 \dashrightarrow 00{:}57{:}57{.}810$  very beginning of the pandemic.

NOTE Confidence: 0.84858656

 $00{:}57{:}57{.}810 \dashrightarrow 00{:}57{:}59{.}853$  I think in the first month or two he

NOTE Confidence: 0.84858656

00:57:59.853 --> 00:58:01.471 wrote a paper and nature of science

NOTE Confidence: 0.84858656

00:58:01.471 --> 00:58:03.200 I think you know modeling out what

NOTE Confidence: 0.84858656

 $00{:}58{:}03{.}250 \dashrightarrow 00{:}58{:}04{.}776$  what that might look like and and

NOTE Confidence: 0.84858656

 $00{:}58{:}04{.}776 \dashrightarrow 00{:}58{:}06{.}605$  and you know that's probably going to

NOTE Confidence: 0.84858656

 $00{:}58{:}06{.}605 \dashrightarrow 00{:}58{:}10{.}450$  that's probably going to come true but.

NOTE Confidence: 0.84858656

 $00{:}58{:}10.450 \dashrightarrow 00{:}58{:}12.630$  Hopefully COVID ends really soon.

NOTE Confidence: 0.84858656

00:58:12.630 --> 00:58:15.500 So. Um, yeah.

NOTE Confidence: 0.63317087

 $00:58:20.460 \longrightarrow 00:58:20.910$  Seems like.

 $00{:}58{:}30{.}980 \dashrightarrow 00{:}58{:}32{.}892$  Yeah so we're so we're overtime and and

NOTE Confidence: 0.880159951333333

00:58:32.892 --> 00:58:35.066 I think you know I mean there's there's

NOTE Confidence: 0.880159951333333

 $00{:}58{:}35{.}066$  -->  $00{:}58{:}37{.}090$  many strategies to try to mitigate but NOTE Confidence: 0.880159951333333

00:58:37.090 --> 00:58:39.120 you can't you can't eliminate bias right.

NOTE Confidence: 0.880159951333333

00:58:39.120 --> 00:58:40.695 So you you can understand it you

NOTE Confidence: 0.880159951333333

 $00{:}58{:}40.695 \dashrightarrow 00{:}58{:}42.721$  can try to mitigate it there's you

NOTE Confidence: 0.880159951333333

 $00{:}58{:}42.721 \dashrightarrow 00{:}58{:}44.341$  know there's matching strategies to

NOTE Confidence: 0.880159951333333

 $00:58:44.341 \rightarrow 00:58:46.482$  if you're doing sort of a you know

NOTE Confidence: 0.880159951333333

 $00:58:46.482 \rightarrow 00:58:48.041$  case and control style approach where

NOTE Confidence: 0.880159951333333

 $00{:}58{:}48.041 \dashrightarrow 00{:}58{:}50.226$  you you try to make the controls as

NOTE Confidence: 0.880159951333333

 $00:58:50.226 \dashrightarrow 00:58:52.025$  similar to the cases you know and

NOTE Confidence: 0.880159951333333

 $00{:}58{:}52{.}025 \dashrightarrow 00{:}58{:}53{.}785$  everything but the. Closure.

NOTE Confidence: 0.880159951333333

 $00:58:53.785 \rightarrow 00:58:56.318$  So you know and and some of those are,

NOTE Confidence: 0.880159951333333

 $00{:}58{:}56{.}320 \dashrightarrow 00{:}58{:}57{.}545$  some of those been around for decades,

NOTE Confidence: 0.880159951333333

 $00{:}58{:}57{.}550 \dashrightarrow 00{:}58{:}59{.}890$  some of those are kind of

NOTE Confidence: 0.880159951333333

 $00:58:59.890 \longrightarrow 00:59:01.450$  emerging at this point.

 $00:59:01.450 \dashrightarrow 00:59:04.276$  But I don't think we can forget that there's

NOTE Confidence: 0.880159951333333

 $00:59:04.276 \rightarrow 00:59:07.858$  bias in in perspective trials as well, right.

NOTE Confidence: 0.880159951333333

 $00{:}59{:}07.858 \dashrightarrow 00{:}59{:}09.594$  So I mean I think either side

NOTE Confidence: 0.880159951333333

 $00:59:09.594 \rightarrow 00:59:10.838$  of the of the coin.

NOTE Confidence: 0.910771256

00:59:12.980 --> 00:59:14.100 Yeah, it's just, it's just,

NOTE Confidence: 0.910771256

 $00:59:14.100 \longrightarrow 00:59:15.444$  it's just one more thing and it's

NOTE Confidence: 0.910771256

 $00:59:15.444 \rightarrow 00:59:17.332$  not the only, I mean it's there's

NOTE Confidence: 0.910771256

 $00:59:17.332 \rightarrow 00:59:18.316$  also there's ascertainment,

NOTE Confidence: 0.910771256

 $00{:}59{:}18.320 \dashrightarrow 00{:}59{:}19.856$  but I mean there's a lot of biases,

NOTE Confidence: 0.910771256

00:59:19.860 --> 00:59:22.072 right and. You know, one thing we've

NOTE Confidence: 0.910771256

 $00{:}59{:}22.072 \dashrightarrow 00{:}59{:}25.255$  worked on with our consortium is developing

NOTE Confidence: 0.910771256

00:59:25.255 --> 00:59:27.423 standardized language around limitations,

NOTE Confidence: 0.910771256

 $00{:}59{:}27{.}430 \dashrightarrow 00{:}59{:}31{.}316$  which I think is critical because you know.

NOTE Confidence: 0.910771256

00:59:31.316 --> 00:59:34.180 I mean, the data is the data are

NOTE Confidence: 0.910771256

 $00{:}59{:}34.180 \dashrightarrow 00{:}59{:}36.986$  the data use the plural, right? But.

NOTE Confidence: 0.910771256 00:59:40.284 --> 00:59:41.815 does influence the reader, right? NOTE Confidence: 0.910771256 00:59:41.815 --> 00:59:43.390 So. So that's something we're NOTE Confidence: 0.910771256 00:59:43.390 --> 00:59:45.219 thinking about and might have some. NOTE Confidence: 0.910771256 00:59:45.220 --> 00:59:46.918 You know, thought pieces or something NOTE Confidence: 0.910771256

 $00:59:36.986 \rightarrow 00:59:40.284$  But the way it's presented really

 $00:59:46.918 \rightarrow 00:59:48.998$  coming out about how to handle that.