WEBVTT

NOTE duration: ”01:11:05.088”

NOTE Confidence: 0.9640702

00:04:51.275 --> 00:04:51.775 Alright.

NOTE Confidence: 0.89479476

00:04:52.395 --> 00:04:53.595 Sorry for the delay. No

NOTE Confidence: 0.89479476

00:04:53.595 --> 00:04:54.095 worries.

NOTE Confidence: 0.98685706

00:04:54.955 --> 00:04:55.675 Hi, everyone.

NOTE Confidence: 0.9547843

00:04:56.075 --> 00:04:58.154 Welcome to, this week's cardiovascular

NOTE Confidence: 0.9547843

00:04:58.154 --> 00:04:59.275 medicine grand rounds, which is

NOTE Confidence: 0.9547843

00:04:59.275 --> 00:05:00.495 a very special occasion,

NOTE Confidence: 0.9677242

00:05:01.230 --> 00:05:02.830 for many reasons, but, not

NOTE Confidence: 0.9677242

00:05:02.830 --> 00:05:04.270 the least. Just to briefly

NOTE Confidence: 0.9677242

00:05:04.270 --> 00:05:05.650 mention, this is our annual,

NOTE Confidence: 0.86076397

00:05:06.430 --> 00:05:06.930 Forrester,

NOTE Confidence: 0.9404383

00:05:07.470 --> 00:05:09.570 Lee or Woody Lee lectureship.

NOTE Confidence: 0.9980095

00:05:10.830 --> 00:05:12.350 In years past, we've gone

NOTE Confidence: 0.9980095

00:05:12.350 --> 00:05:13.490 into great detail

NOTE Confidence: 0.93942237

00:05:14.474 --> 00:05:14.914 to,

NOTE Confidence: 0.9661685

00:05:15.354 --> 00:05:17.194 to highlight all the ways

NOTE Confidence: 0.9661685

00:05:17.194 --> 00:05:19.034 that doctor Lee represents the

NOTE Confidence: 0.9661685

00:05:19.034 --> 00:05:19.995 best of us and really

NOTE Confidence: 0.9661685

00:05:19.995 --> 00:05:20.814 had a magnificent

NOTE Confidence: 0.90752774

00:05:21.115 --> 00:05:22.794 and longstanding impact on our

NOTE Confidence: 0.90752774

00:05:22.794 --> 00:05:23.294 organization.

NOTE Confidence: 0.97552764

00:05:23.675 --> 00:05:25.194 Today, because we're getting started

NOTE Confidence: 0.97552764

00:05:25.194 --> 00:05:25.914 a little late, I might

NOTE Confidence: 0.97552764

00:05:25.914 --> 00:05:26.955 shorten that, Woody, if you

NOTE Confidence: 0.97552764

00:05:26.955 --> 00:05:28.154 don't mind. But just to

NOTE Confidence: 0.97552764

00:05:28.154 --> 00:05:30.000 highlight the fact that without

NOTE Confidence: 0.97552764

00:05:30.000 --> 00:05:30.980 doctor Lee,

NOTE Confidence: 0.9561691

00:05:31.760 --> 00:05:34.480 this, institution would be, would

NOTE Confidence: 0.9561691

00:05:34.480 --> 00:05:36.400 be nothing like itself. Now

NOTE Confidence: 0.9561691

00:05:36.400 --> 00:05:38.180 he had an immense impact

NOTE Confidence: 0.9561691

00:05:38.400 --> 00:05:39.120 at the level of the

NOTE Confidence: 0.9561691

00:05:39.120 --> 00:05:40.160 school of medicine at the

NOTE Confidence: 0.9561691

00:05:40.160 --> 00:05:40.660 university

NOTE Confidence: 0.96554136

00:05:41.200 --> 00:05:42.639 in expanding our,

NOTE Confidence: 0.94751966

00:05:43.040 --> 00:05:44.740 understanding of how to,

NOTE Confidence: 0.9862096

00:05:46.125 --> 00:05:47.724 build a more inclusive environment

NOTE Confidence: 0.9862096

00:05:47.724 --> 00:05:49.745 and to recognize the opportunities

NOTE Confidence: 0.9683124

00:05:50.205 --> 00:05:50.685 of,

NOTE Confidence: 0.94294804

00:05:51.085 --> 00:05:51.904 of of different,

NOTE Confidence: 0.98419684

00:05:52.685 --> 00:05:54.544 trainees as well as physicians

NOTE Confidence: 0.98419684

00:05:54.604 --> 00:05:55.745 and and faculty,

NOTE Confidence: 0.96678925

00:05:56.764 --> 00:05:58.604 across the spectrum of of

NOTE Confidence: 0.96678925

00:05:58.604 --> 00:05:59.345 race, ethnicity,

NOTE Confidence: 0.8928783

00:06:00.410 --> 00:06:02.910 and and, primary kinda practice

NOTE Confidence: 0.8928783

00:06:02.970 --> 00:06:03.470 origin.

NOTE Confidence: 0.95570195

00:06:04.089 --> 00:06:05.930 And that, I think continues

NOTE Confidence: 0.95570195

00:06:05.930 --> 00:06:07.210 to pay dividends for us

NOTE Confidence: 0.95570195

00:06:07.210 --> 00:06:08.250 as a university and a

NOTE Confidence: 0.95570195

00:06:08.250 --> 00:06:09.070 school of medicine.

NOTE Confidence: 0.99564207

00:06:09.690 --> 00:06:11.630 As a cardiovascular medicine community,

NOTE Confidence: 0.93992513

00:06:12.345 --> 00:06:14.025 without doctor Li, I would

NOTE Confidence: 0.93992513

00:06:14.025 --> 00:06:15.145 dare say we would not

NOTE Confidence: 0.93992513

00:06:15.145 --> 00:06:16.925 have a heart failure program,

NOTE Confidence: 0.96937865

00:06:17.464 --> 00:06:18.664 and I think he had

NOTE Confidence: 0.96937865

00:06:18.664 --> 00:06:20.365 an immense impact on initiating

NOTE Confidence: 0.9032304

00:06:20.824 --> 00:06:22.505 our transplant program, our heart

NOTE Confidence: 0.9032304

00:06:22.505 --> 00:06:24.104 failure program, and now with

NOTE Confidence: 0.9032304

00:06:24.104 --> 00:06:25.384 the faculty of a of

NOTE Confidence: 0.9032304

00:06:25.384 --> 00:06:26.365 nearly a dozen,

NOTE Confidence: 0.99154395

00:06:26.669 --> 00:06:27.550 when I think you were

NOTE Confidence: 0.99154395

00:06:27.550 --> 00:06:28.050 only

NOTE Confidence: 0.99614185

00:06:28.750 --> 00:06:29.250 one

NOTE Confidence: 0.97562695

00:06:30.029 --> 00:06:30.850 when you started.

NOTE Confidence: 0.9574987

00:06:32.190 --> 00:06:33.470 It, I I I hope

NOTE Confidence: 0.9574987

00:06:33.470 --> 00:06:35.070 he, sees the the the

NOTE Confidence: 0.9574987

00:06:35.070 --> 00:06:36.029 the great fruits of his

NOTE Confidence: 0.9574987

00:06:36.029 --> 00:06:38.270 labor. Welcome again to,

NOTE Confidence: 0.9899888

00:06:38.669 --> 00:06:39.810 all of the people,

NOTE Confidence: 0.997454

00:06:40.669 --> 00:06:41.705 across the state.

NOTE Confidence: 0.957105

00:06:42.504 --> 00:06:43.544 I hope you're enjoying your

NOTE Confidence: 0.957105

00:06:43.544 --> 00:06:44.745 lunch at our watch parties,

NOTE Confidence: 0.957105

00:06:44.745 --> 00:06:45.705 and thanks to the team

NOTE Confidence: 0.957105

00:06:45.705 --> 00:06:47.964 who's organized this, this event.

NOTE Confidence: 0.957105

00:06:48.185 --> 00:06:49.544 With that, I'm gonna let

NOTE Confidence: 0.957105

00:06:49.544 --> 00:06:51.944 doctor, Davila introduce our speaker

NOTE Confidence: 0.957105

00:06:51.944 --> 00:06:53.865 who is a really, a

NOTE Confidence: 0.957105

00:06:53.865 --> 00:06:55.884 great testament to the investigative

NOTE Confidence: 0.89000034

00:06:56.940 --> 00:06:58.700 interests of doctor Li. And,

NOTE Confidence: 0.96497315

00:06:59.500 --> 00:07:00.940 Carlos, take it away. Thanks,

NOTE Confidence: 0.96497315

00:07:00.940 --> 00:07:01.420 Eric.

NOTE Confidence: 0.9563019

00:07:01.980 --> 00:07:02.480 Welcome.

NOTE Confidence: 0.9787886

00:07:03.020 --> 00:07:04.220 I'm very excited to introduce

NOTE Confidence: 0.9787886

00:07:04.220 --> 00:07:05.580 today's speaker and to do

NOTE Confidence: 0.9787886

00:07:05.580 --> 00:07:06.620 so on behalf of the

NOTE Confidence: 0.9787886

00:07:06.620 --> 00:07:08.000 Forrester Li lecture.

NOTE Confidence: 0.94872403

00:07:08.460 --> 00:07:09.340 As I was reading more

NOTE Confidence: 0.94872403

00:07:09.340 --> 00:07:10.664 about doctor Li's work, not

NOTE Confidence: 0.94872403

00:07:10.664 --> 00:07:12.264 only in cardiac transplant, but

NOTE Confidence: 0.94872403

00:07:12.264 --> 00:07:14.185 also long standing commitment to

NOTE Confidence: 0.94872403

00:07:14.185 --> 00:07:16.044 faculty inclusion on diversity,

NOTE Confidence: 0.95613426

00:07:16.504 --> 00:07:17.544 I was struck by how

NOTE Confidence: 0.95613426

00:07:17.544 --> 00:07:19.305 his legacy continues to shape

NOTE Confidence: 0.95613426

00:07:19.305 --> 00:07:20.264 who has a voice in

NOTE Confidence: 0.95613426

00:07:20.264 --> 00:07:21.324 forums like this.

NOTE Confidence: 0.91966915

00:07:21.944 --> 00:07:22.824 It is in that very

NOTE Confidence: 0.91966915

00:07:22.824 --> 00:07:24.104 much spirit and because of

NOTE Confidence: 0.91966915

00:07:24.104 --> 00:07:25.544 work of leaders like doctor

NOTE Confidence: 0.91966915

00:07:25.544 --> 00:07:26.800 Lee that I feel especially

NOTE Confidence: 0.91966915

00:07:26.800 --> 00:07:28.800 honored to introduce doctor Daniel

NOTE Confidence: 0.91966915

00:07:28.800 --> 00:07:29.300 Barkoff.

NOTE Confidence: 0.98065144

00:07:29.919 --> 00:07:31.520 Doctor Barkoff is the director

NOTE Confidence: 0.98065144

00:07:31.520 --> 00:07:33.199 of heart failure hemodynamics and

NOTE Confidence: 0.98065144

00:07:33.199 --> 00:07:35.120 mechanical circulatory support research at

NOTE Confidence: 0.98065144

00:07:35.120 --> 00:07:37.199 the Cardiovascular Research Foundation and

NOTE Confidence: 0.98065144

00:07:37.199 --> 00:07:38.720 an adjunct associate professor of

NOTE Confidence: 0.98065144

00:07:38.720 --> 00:07:39.780 medicine at Columbia.

NOTE Confidence: 0.9202323

00:07:40.395 --> 00:07:41.595 His training reflects,

NOTE Confidence: 0.9860544

00:07:41.995 --> 00:07:44.235 powerful blend of engineering and

NOTE Confidence: 0.9860544

00:07:44.235 --> 00:07:44.735 medicine.

NOTE Confidence: 0.99233836

00:07:45.035 --> 00:07:46.235 He earned a degree in

NOTE Confidence: 0.99233836

00:07:46.235 --> 00:07:48.415 applied engineering physics from Cornell,

NOTE Confidence: 0.9859076

00:07:48.794 --> 00:07:50.475 followed by both his MD

NOTE Confidence: 0.9859076

00:07:50.475 --> 00:07:52.395 and PhD in biomedical engineering

NOTE Confidence: 0.9859076

00:07:52.395 --> 00:07:54.075 from Hopkins, where he also

NOTE Confidence: 0.9859076

00:07:54.075 --> 00:07:55.615 completed his cardiology fellowship.

NOTE Confidence: 0.96220934

00:07:56.190 --> 00:07:58.030 He has led major academic

NOTE Confidence: 0.96220934

00:07:58.030 --> 00:08:00.030 and research programs, including founding

NOTE Confidence: 0.96220934

00:08:00.030 --> 00:08:01.949 the cardiovascular research laboratory at

NOTE Confidence: 0.96220934

00:08:01.949 --> 00:08:03.870 Columbia, and directing the Skirball

NOTE Confidence: 0.96220934

00:08:03.870 --> 00:08:05.389 Center for Cardiovascular Research at

NOTE Confidence: 0.96220934

00:08:05.389 --> 00:08:05.889 CRF.

NOTE Confidence: 0.98637015

00:08:06.669 --> 00:08:07.410 His career

NOTE Confidence: 0.99929434

00:08:07.805 --> 00:08:10.065 career uniquely bridges fundamental cardiovascular

NOTE Confidence: 0.99929434

00:08:10.285 --> 00:08:10.785 physiology,

NOTE Confidence: 0.9959121

00:08:11.165 --> 00:08:12.385 translational medicine,

NOTE Confidence: 0.9935379

00:08:12.765 --> 00:08:14.785 clinical trials, and device innovation,

NOTE Confidence: 0.96249837

00:08:15.485 --> 00:08:17.405 including servings as medical director

NOTE Confidence: 0.96249837

00:08:17.405 --> 00:08:18.945 for multiple start up companies

NOTE Confidence: 0.96249837

00:08:19.085 --> 00:08:20.705 focused on heart failure diagnosis,

NOTE Confidence: 0.96249837

00:08:20.925 --> 00:08:23.490 mechanical circulatory support, and novel

NOTE Confidence: 0.96249837

00:08:23.490 --> 00:08:23.990 therapeutics.

NOTE Confidence: 0.9825346

00:08:25.250 --> 00:08:26.370 Dan has published more than

NOTE Confidence: 0.9825346

00:08:26.370 --> 00:08:27.889 five hundred peer review articles

NOTE Confidence: 0.9825346

00:08:27.889 --> 00:08:29.910 with seminal contributions in ventricular

NOTE Confidence: 0.9825346

00:08:29.970 --> 00:08:32.309 mechanics, remodeling, and mechanical circulatory

NOTE Confidence: 0.9825346

00:08:32.370 --> 00:08:32.870 support.

NOTE Confidence: 0.9688584

00:08:33.330 --> 00:08:34.950 He also directs the CRF

NOTE Confidence: 0.9688584

00:08:35.235 --> 00:08:37.554 international recognized teach program, which

NOTE Confidence: 0.9688584

00:08:37.554 --> 00:08:39.175 I'm a proud alumni from,

NOTE Confidence: 0.9688584

00:08:39.395 --> 00:08:40.695 and the creator of Harvey.

NOTE Confidence: 0.9688584

00:08:40.755 --> 00:08:42.035 He also serves as director

NOTE Confidence: 0.9688584

00:08:42.035 --> 00:08:43.395 of the THD Conference, one

NOTE Confidence: 0.9688584

00:08:43.395 --> 00:08:44.835 of the largest global meetings

NOTE Confidence: 0.9688584

00:08:44.835 --> 00:08:46.275 focused on technology and heart

NOTE Confidence: 0.9688584

00:08:46.275 --> 00:08:47.175 failure therapeutics.

NOTE Confidence: 0.9835467

00:08:47.970 --> 00:08:49.250 We're incredibly fortunate to have

NOTE Confidence: 0.9835467

00:08:49.250 --> 00:08:50.450 him today with us speaking

NOTE Confidence: 0.9835467

00:08:50.450 --> 00:08:51.970 on cardiogenic shock, a topic

NOTE Confidence: 0.9835467

00:08:51.970 --> 00:08:53.010 that is a center of

NOTE Confidence: 0.9835467

00:08:53.010 --> 00:08:55.429 active discussion across multiple subspecialties

NOTE Confidence: 0.9835467

00:08:55.649 --> 00:08:57.350 within cardiology and within medicine.

NOTE Confidence: 0.972554

00:08:57.730 --> 00:08:58.850 Please join me in welcoming

NOTE Confidence: 0.972554

00:08:58.850 --> 00:08:59.910 doctor Daniel Barkoff.

NOTE Confidence: 0.98004544

00:09:05.425 --> 00:09:06.705 Thank you all very much,

NOTE Confidence: 0.98004544

00:09:06.705 --> 00:09:07.985 and, I've just really had

NOTE Confidence: 0.98004544

00:09:07.985 --> 00:09:09.184 a great a great morning

NOTE Confidence: 0.98004544

00:09:09.184 --> 00:09:10.145 so far, and I'm sure

NOTE Confidence: 0.98004544

00:09:10.145 --> 00:09:10.785 the rest of the day

NOTE Confidence: 0.98004544

00:09:10.785 --> 00:09:12.304 will be will be equally

NOTE Confidence: 0.98004544

00:09:12.304 --> 00:09:12.804 fun.

NOTE Confidence: 0.9779819

00:09:13.184 --> 00:09:13.505 And,

NOTE Confidence: 0.9858959

00:09:14.304 --> 00:09:15.745 I will try to let's

NOTE Confidence: 0.9858959

00:09:15.745 --> 00:09:16.705 see. How do we advance

NOTE Confidence: 0.9858959

00:09:16.705 --> 00:09:17.684 the slides, though?

NOTE Confidence: 0.92456067

00:09:21.640 --> 00:09:22.600 Clicker. Now we're on the

NOTE Confidence: 0.96385175

00:09:27.240 --> 00:09:28.120 doctor Li, I had the

NOTE Confidence: 0.96385175

00:09:28.120 --> 00:09:29.480 pleasure to meet doctor Li

NOTE Confidence: 0.96385175

00:09:29.480 --> 00:09:30.519 just a few minutes ago,

NOTE Confidence: 0.96385175

00:09:30.519 --> 00:09:31.800 and it was really, really

NOTE Confidence: 0.96385175

00:09:31.800 --> 00:09:32.620 fun. Okay.

NOTE Confidence: 0.96637094

00:09:33.434 --> 00:09:35.035 So, today, we're gonna talk

NOTE Confidence: 0.96637094

00:09:35.035 --> 00:09:36.715 about cardiogenic shock. It's a

NOTE Confidence: 0.96637094

00:09:36.715 --> 00:09:37.215 massive,

NOTE Confidence: 0.98987305

00:09:38.315 --> 00:09:39.515 task to talk about this

NOTE Confidence: 0.98987305

00:09:39.515 --> 00:09:40.755 because there's so much, really

NOTE Confidence: 0.98987305

00:09:40.875 --> 00:09:42.335 there's so much going on.

NOTE Confidence: 0.9480728

00:09:42.875 --> 00:09:44.495 These are some relevant disclosures,

NOTE Confidence: 0.98952186

00:09:45.115 --> 00:09:46.315 and I do wanna make

NOTE Confidence: 0.98952186

00:09:46.315 --> 00:09:47.115 a little pitch for the

NOTE Confidence: 0.98952186

00:09:47.115 --> 00:09:48.395 THT meeting, which is coming

NOTE Confidence: 0.98952186

00:09:48.395 --> 00:09:49.190 up in about two and

NOTE Confidence: 0.98952186

00:09:49.190 --> 00:09:49.970 a half weeks.

NOTE Confidence: 0.97010493

00:09:50.270 --> 00:09:51.870 And in particular, the day

NOTE Confidence: 0.97010493

00:09:51.870 --> 00:09:53.650 before on March first, Sunday,

NOTE Confidence: 0.97010493

00:09:53.950 --> 00:09:55.550 we're gonna be hosting a,

NOTE Confidence: 0.97010493

00:09:55.950 --> 00:09:56.910 for the first time, a

NOTE Confidence: 0.97010493

00:09:56.910 --> 00:09:58.290 hands on training day,

NOTE Confidence: 0.9394623

00:09:59.150 --> 00:10:00.830 that is focused for fellows

NOTE Confidence: 0.9394623

00:10:00.830 --> 00:10:02.130 and APP APPs.

NOTE Confidence: 0.9447489

00:10:03.150 --> 00:10:03.470 And,

NOTE Confidence: 0.9880337

00:10:04.005 --> 00:10:05.525 it's we're gonna cover things

NOTE Confidence: 0.9880337

00:10:05.525 --> 00:10:06.825 like ECMO, Impella,

NOTE Confidence: 0.95504415

00:10:07.445 --> 00:10:09.545 balloon pump, LVADs, total artificial

NOTE Confidence: 0.95504415

00:10:09.605 --> 00:10:11.684 heart, and PA pressure sensors,

NOTE Confidence: 0.95504415

00:10:11.684 --> 00:10:13.065 and on all the practical

NOTE Confidence: 0.95504415

00:10:13.125 --> 00:10:14.405 hands on aspects. And it's

NOTE Confidence: 0.95504415

00:10:14.405 --> 00:10:15.385 totally free,

NOTE Confidence: 0.9558756

00:10:16.245 --> 00:10:17.845 free meeting. And so please

NOTE Confidence: 0.9558756

00:10:17.845 --> 00:10:18.345 consider,

NOTE Confidence: 0.9474951

00:10:19.829 --> 00:10:21.390 you know, attending this. So

NOTE Confidence: 0.9474951

00:10:21.390 --> 00:10:23.010 let's get to cardiogenic shock.

NOTE Confidence: 0.9843801

00:10:23.550 --> 00:10:24.929 So this is an image,

NOTE Confidence: 0.93841

00:10:25.309 --> 00:10:26.929 from, Judy Hockman,

NOTE Confidence: 0.938615

00:10:27.390 --> 00:10:28.929 who ran the shock trial.

NOTE Confidence: 0.9520972

00:10:29.390 --> 00:10:30.910 And this was, in the

NOTE Confidence: 0.9520972

00:10:30.910 --> 00:10:32.110 late nineties kind of the

NOTE Confidence: 0.9520972

00:10:32.110 --> 00:10:33.809 model of of a cardiogenic

NOTE Confidence: 0.9520972

00:10:34.025 --> 00:10:35.645 shock. There was a myocardial

NOTE Confidence: 0.9520972

00:10:35.785 --> 00:10:37.245 insult, in this case, myocardial

NOTE Confidence: 0.9520972

00:10:37.385 --> 00:10:37.885 infarction

NOTE Confidence: 0.93598574

00:10:38.345 --> 00:10:39.705 that led to reductions in

NOTE Confidence: 0.93598574

00:10:39.705 --> 00:10:41.965 left, right, or both ventricular

NOTE Confidence: 0.93598574

00:10:42.105 --> 00:10:42.605 contractilities,

NOTE Confidence: 0.9689369

00:10:43.145 --> 00:10:44.505 reduction in blood pressure, and

NOTE Confidence: 0.9689369

00:10:44.505 --> 00:10:45.565 cardiac output.

NOTE Confidence: 0.989449

00:10:46.040 --> 00:10:47.880 And then there are these,

NOTE Confidence: 0.989449

00:10:48.120 --> 00:10:49.420 the secondary effects

NOTE Confidence: 0.9119849

00:10:50.120 --> 00:10:51.420 of related to the baroceptor

NOTE Confidence: 0.9119849

00:10:51.559 --> 00:10:52.059 activation

NOTE Confidence: 0.9794189

00:10:52.679 --> 00:10:53.500 with increases

NOTE Confidence: 0.9766949

00:10:53.960 --> 00:10:55.900 in heart rate, systemic vascular

NOTE Confidence: 0.9766949

00:10:55.960 --> 00:10:56.460 resistance,

NOTE Confidence: 0.95056754

00:10:57.160 --> 00:10:57.980 and also

NOTE Confidence: 0.91960186

00:10:58.434 --> 00:11:00.195 not well appreciated, but a

NOTE Confidence: 0.91960186

00:11:00.195 --> 00:11:01.235 really a lot of action

NOTE Confidence: 0.91960186

00:11:01.235 --> 00:11:02.595 happens in the venous system.

NOTE Confidence: 0.91960186

00:11:02.595 --> 00:11:03.495 Venal constriction

NOTE Confidence: 0.999084

00:11:03.795 --> 00:11:05.095 is really what contributes

NOTE Confidence: 0.9661003

00:11:05.475 --> 00:11:07.095 to the rise in CVP

NOTE Confidence: 0.9661003

00:11:07.235 --> 00:11:08.835 and, and wedge pressure that

NOTE Confidence: 0.9661003

00:11:08.835 --> 00:11:09.575 we see.

NOTE Confidence: 0.99614704

00:11:09.955 --> 00:11:11.029 So then,

NOTE Confidence: 0.95154434

00:11:11.410 --> 00:11:12.370 this was the this is

NOTE Confidence: 0.95154434

00:11:12.370 --> 00:11:13.730 what happens in early shock

NOTE Confidence: 0.95154434

00:11:13.730 --> 00:11:15.750 and then it was, appreciated

NOTE Confidence: 0.9769579

00:11:16.209 --> 00:11:17.670 a little bit later that,

NOTE Confidence: 0.9297462

00:11:18.290 --> 00:11:19.649 as the shock state persists,

NOTE Confidence: 0.9297462

00:11:19.649 --> 00:11:21.490 there's an inflammatory response that

NOTE Confidence: 0.9297462

00:11:21.490 --> 00:11:22.630 purse that ensues

NOTE Confidence: 0.9244945

00:11:23.045 --> 00:11:24.725 and this actually counteracts a

NOTE Confidence: 0.9244945

00:11:24.725 --> 00:11:25.605 lot of the things that

NOTE Confidence: 0.9244945

00:11:25.605 --> 00:11:27.464 are that the baroceptors do

NOTE Confidence: 0.9244945

00:11:27.524 --> 00:11:28.985 and actually to vasodilatory

NOTE Confidence: 0.9893571

00:11:29.524 --> 00:11:30.605 state that

NOTE Confidence: 0.40360463

00:11:31.045 --> 00:11:31.545 exacerbate

NOTE Confidence: 0.86729735

00:11:32.005 --> 00:11:34.105 the exacerbate the situation.

NOTE Confidence: 0.9399376

00:11:34.804 --> 00:11:36.084 So that in the longer

NOTE Confidence: 0.9399376

00:11:36.084 --> 00:11:36.584 term

NOTE Confidence: 0.93656707

00:11:37.350 --> 00:11:38.490 inflammation, vasodilation,

NOTE Confidence: 0.96883374

00:11:38.870 --> 00:11:40.329 and multi organ system

NOTE Confidence: 0.74409366

00:11:41.029 --> 00:11:42.089 failure ensue.

NOTE Confidence: 0.8744398

00:11:42.630 --> 00:11:44.089 So early on shock

NOTE Confidence: 0.93562996

00:11:44.470 --> 00:11:46.250 starts as a hemodynamic problem

NOTE Confidence: 0.93562996

00:11:46.550 --> 00:11:47.990 and as time goes by

NOTE Confidence: 0.93562996

00:11:47.990 --> 00:11:49.429 it gets worse and involves

NOTE Confidence: 0.93562996

00:11:49.429 --> 00:11:50.550 more and more organs of

NOTE Confidence: 0.93562996

00:11:50.550 --> 00:11:52.250 the body becomes a hemometabolic

NOTE Confidence: 0.6594056

00:11:53.725 --> 00:11:54.225 condition.

NOTE Confidence: 0.9415262

00:11:54.925 --> 00:11:55.965 And if we look at,

NOTE Confidence: 0.9415262

00:11:56.445 --> 00:11:58.445 look at just phenotyping patients

NOTE Confidence: 0.9415262

00:11:58.445 --> 00:11:59.665 in terms of both hemodynamics

NOTE Confidence: 0.9415262

00:11:59.885 --> 00:12:00.625 and metabolics,

NOTE Confidence: 0.9284618

00:12:01.165 --> 00:12:02.365 we can see we found

NOTE Confidence: 0.9284618

00:12:02.365 --> 00:12:03.885 in the shock working group

NOTE Confidence: 0.9284618

00:12:03.885 --> 00:12:06.205 we found three relatively distinct

NOTE Confidence: 0.9284618

00:12:06.205 --> 00:12:06.705 phenotypes

NOTE Confidence: 0.94729745

00:12:07.245 --> 00:12:08.785 that start out in in

NOTE Confidence: 0.9456913

00:12:09.520 --> 00:12:11.200 phenotype one, which is mainly

NOTE Confidence: 0.9456913

00:12:11.200 --> 00:12:11.700 hemodynamic

NOTE Confidence: 0.74051756

00:12:12.320 --> 00:12:12.820 and,

NOTE Confidence: 0.99821633

00:12:13.520 --> 00:12:14.020 transitioning

NOTE Confidence: 0.9747682

00:12:14.720 --> 00:12:15.700 to a cardiorenal

NOTE Confidence: 0.946442

00:12:16.080 --> 00:12:18.160 phenotype and then ultimately into

NOTE Confidence: 0.946442

00:12:18.160 --> 00:12:19.140 a cardiometabolic

NOTE Confidence: 0.82479715

00:12:20.080 --> 00:12:21.220 syndrome where

NOTE Confidence: 0.9635576

00:12:21.715 --> 00:12:23.235 multiple organs of the body

NOTE Confidence: 0.9635576

00:12:23.235 --> 00:12:23.895 are affected.

NOTE Confidence: 0.99527586

00:12:24.434 --> 00:12:25.875 And as you transition from

NOTE Confidence: 0.99527586

00:12:25.875 --> 00:12:26.535 the hemodynamic

NOTE Confidence: 0.9848229

00:12:26.835 --> 00:12:28.295 towards the hemometabolic

NOTE Confidence: 0.58957475

00:12:28.755 --> 00:12:29.655 the mortality,

NOTE Confidence: 0.811262

00:12:30.434 --> 00:12:31.815 at the time you know,

NOTE Confidence: 0.6601023

00:12:32.355 --> 00:12:33.015 the mortality,

NOTE Confidence: 0.9739051

00:12:33.554 --> 00:12:35.095 thirty day mortality worsens

NOTE Confidence: 0.88440526

00:12:35.475 --> 00:12:36.940 as a as the patient

NOTE Confidence: 0.88440526

00:12:36.940 --> 00:12:39.040 presents in a worse condition.

NOTE Confidence: 0.882953

00:12:40.300 --> 00:12:41.519 This is highlighted

NOTE Confidence: 0.9853464

00:12:42.059 --> 00:12:43.019 in a little bit more

NOTE Confidence: 0.9853464

00:12:43.019 --> 00:12:44.080 detail in a recent

NOTE Confidence: 0.9089713

00:12:44.459 --> 00:12:45.660 review paper in New New

NOTE Confidence: 0.9089713

00:12:45.660 --> 00:12:47.179 England Journal that just appeared

NOTE Confidence: 0.9089713

00:12:47.179 --> 00:12:47.920 last month.

NOTE Confidence: 0.9940022

00:12:48.620 --> 00:12:50.480 And here you can see

NOTE Confidence: 0.9681557

00:12:51.684 --> 00:12:53.845 really, in the ultimately shock

NOTE Confidence: 0.9681557

00:12:53.845 --> 00:12:55.285 really affects almost every organ

NOTE Confidence: 0.9681557

00:12:55.285 --> 00:12:56.404 in the body and has

NOTE Confidence: 0.9681557

00:12:56.404 --> 00:12:57.144 an implication

NOTE Confidence: 0.8838563

00:12:57.605 --> 00:12:58.745 for, prognosis.

NOTE Confidence: 0.9449473

00:12:59.684 --> 00:13:01.045 Now another way to look

NOTE Confidence: 0.9449473

00:13:01.045 --> 00:13:03.045 at shock is through physio

NOTE Confidence: 0.9449473

00:13:03.285 --> 00:13:04.024 more physiological

NOTE Confidence: 0.77275455

00:13:04.404 --> 00:13:04.904 perspective.

NOTE Confidence: 0.90533876

00:13:05.649 --> 00:13:06.450 And I'm gonna try to

NOTE Confidence: 0.90533876

00:13:06.450 --> 00:13:07.570 mix the clinical and the

NOTE Confidence: 0.90533876

00:13:07.570 --> 00:13:08.630 physiology together.

NOTE Confidence: 0.9821097

00:13:09.089 --> 00:13:10.130 And when I talk about

NOTE Confidence: 0.9821097

00:13:10.130 --> 00:13:11.570 physiology, I talk about things

NOTE Confidence: 0.9821097

00:13:11.570 --> 00:13:12.950 in the pressure volume domain.

NOTE Confidence: 0.96802455

00:13:13.730 --> 00:13:15.170 This is normal pressure volume

NOTE Confidence: 0.96802455

00:13:15.170 --> 00:13:16.130 loop bounded by the end

NOTE Confidence: 0.96802455

00:13:16.130 --> 00:13:17.809 systolic and end diastolic pressure

NOTE Confidence: 0.96802455

00:13:17.809 --> 00:13:18.630 volume relationship,

NOTE Confidence: 0.96383286

00:13:19.575 --> 00:13:20.695 And this is what happens

NOTE Confidence: 0.96383286

00:13:20.695 --> 00:13:21.975 when you change preload after

NOTE Confidence: 0.96383286

00:13:21.975 --> 00:13:23.495 load and contractility. This is

NOTE Confidence: 0.96383286

00:13:23.495 --> 00:13:25.335 all very basic medical school

NOTE Confidence: 0.96383286

00:13:25.335 --> 00:13:25.835 stuff,

NOTE Confidence: 0.99123114

00:13:26.215 --> 00:13:27.495 but also the one of

NOTE Confidence: 0.99123114

00:13:27.495 --> 00:13:28.934 the advantages of the pressure

NOTE Confidence: 0.99123114

00:13:28.934 --> 00:13:29.975 volume domain is that we

NOTE Confidence: 0.99123114

00:13:29.975 --> 00:13:31.675 can also understand about metabolics

NOTE Confidence: 0.92612

00:13:32.215 --> 00:13:33.815 because there's a very tight

NOTE Confidence: 0.92612

00:13:33.815 --> 00:13:34.315 relationship

NOTE Confidence: 0.9997435

00:13:34.615 --> 00:13:35.070 between

NOTE Confidence: 0.8798108

00:13:35.550 --> 00:13:36.530 this parameter,

NOTE Confidence: 0.9783693

00:13:37.390 --> 00:13:39.070 with the, the stroke work

NOTE Confidence: 0.9783693

00:13:39.070 --> 00:13:40.670 and what's called the potential

NOTE Confidence: 0.9783693

00:13:40.670 --> 00:13:42.130 energy which is this area

NOTE Confidence: 0.9783693

00:13:42.190 --> 00:13:43.630 inside of the pressure volume

NOTE Confidence: 0.9783693

00:13:43.630 --> 00:13:45.630 loop that relates very closely

NOTE Confidence: 0.9783693

00:13:45.630 --> 00:13:47.755 to myocardial oxygen consumption which

NOTE Confidence: 0.9783693

00:13:47.755 --> 00:13:48.875 we think plays a big

NOTE Confidence: 0.9783693

00:13:48.875 --> 00:13:50.654 role in understanding therapeutics,

NOTE Confidence: 0.9298356

00:13:51.514 --> 00:13:54.074 and prognosis in, in, in

NOTE Confidence: 0.9298356

00:13:54.074 --> 00:13:55.454 a cardiogenic shock.

NOTE Confidence: 0.90527576

00:13:55.915 --> 00:13:57.214 So if we look at

NOTE Confidence: 0.90527576

00:13:57.274 --> 00:13:57.855 it physiologically

NOTE Confidence: 0.9377653

00:13:58.235 --> 00:13:59.115 at least in the short

NOTE Confidence: 0.9377653

00:13:59.115 --> 00:13:59.615 term,

NOTE Confidence: 0.93956023

00:14:00.069 --> 00:14:01.190 this is what happens when

NOTE Confidence: 0.93956023

00:14:01.190 --> 00:14:02.009 there's biventricular

NOTE Confidence: 0.8001242

00:14:03.190 --> 00:14:04.410 involvement. You see,

NOTE Confidence: 0.9634083

00:14:04.790 --> 00:14:06.250 that both the end systolic

NOTE Confidence: 0.9634083

00:14:06.470 --> 00:14:07.910 pressure volume relationship of the

NOTE Confidence: 0.9634083

00:14:07.910 --> 00:14:09.129 right and the left ventricles,

NOTE Confidence: 0.7027663

00:14:09.910 --> 00:14:10.410 decline,

NOTE Confidence: 0.9467928

00:14:11.029 --> 00:14:12.089 then the baroceptors

NOTE Confidence: 0.95171297

00:14:12.550 --> 00:14:14.415 activate, there's increases in heart

NOTE Confidence: 0.95171297

00:14:14.415 --> 00:14:16.415 rate, increases in systemic vascular

NOTE Confidence: 0.95171297

00:14:16.415 --> 00:14:16.915 resistance,

NOTE Confidence: 0.8484025

00:14:17.455 --> 00:14:18.755 and there's that venoconstriction

NOTE Confidence: 0.9538888

00:14:19.135 --> 00:14:20.495 which increases what's called the

NOTE Confidence: 0.9538888

00:14:20.495 --> 00:14:22.515 stress blood volume, and then

NOTE Confidence: 0.7849325

00:14:22.975 --> 00:14:24.335 the pet what happens to

NOTE Confidence: 0.7849325

00:14:24.335 --> 00:14:25.555 CVP and wedge

NOTE Confidence: 0.9888771

00:14:25.910 --> 00:14:27.530 really depend on the relative

NOTE Confidence: 0.9888771

00:14:27.750 --> 00:14:29.690 contributions or the relative diminution

NOTE Confidence: 0.92094636

00:14:30.070 --> 00:14:31.750 of right and left sided,

NOTE Confidence: 0.92094636

00:14:31.990 --> 00:14:32.490 contractilities

NOTE Confidence: 0.8890926

00:14:32.790 --> 00:14:34.710 and the degree of, venal

NOTE Confidence: 0.8890926

00:14:34.710 --> 00:14:35.210 constriction.

NOTE Confidence: 0.97406983

00:14:35.910 --> 00:14:37.190 And in fact, if we

NOTE Confidence: 0.97406983

00:14:37.190 --> 00:14:38.710 look at this is registry

NOTE Confidence: 0.97406983

00:14:38.710 --> 00:14:40.150 data from the cardiogenic shock

NOTE Confidence: 0.97406983

00:14:40.150 --> 00:14:41.425 working group. This is what

NOTE Confidence: 0.97406983

00:14:41.425 --> 00:14:43.204 we call the, the congestion

NOTE Confidence: 0.97406983

00:14:43.264 --> 00:14:45.105 profile where we plot the

NOTE Confidence: 0.97406983

00:14:45.105 --> 00:14:46.545 right atrial pressure versus the

NOTE Confidence: 0.97406983

00:14:46.545 --> 00:14:48.404 wedge pressure, and we divide

NOTE Confidence: 0.97406983

00:14:48.545 --> 00:14:48.865 this,

NOTE Confidence: 0.98654556

00:14:49.665 --> 00:14:51.204 this graph into four quadrants.

NOTE Confidence: 0.96890056

00:14:52.065 --> 00:14:53.529 Upper left is when only

NOTE Confidence: 0.96890056

00:14:53.529 --> 00:14:54.970 the wedge pressure is elevated.

NOTE Confidence: 0.96890056

00:14:54.970 --> 00:14:56.089 Bottom right is when only

NOTE Confidence: 0.96890056

00:14:56.089 --> 00:14:57.470 the CVP is elevated.

NOTE Confidence: 0.97463715

00:14:58.010 --> 00:15:00.010 The upper, right quadrant is

NOTE Confidence: 0.97463715

00:15:00.010 --> 00:15:01.690 what we call bilateral congestion

NOTE Confidence: 0.97463715

00:15:01.690 --> 00:15:02.670 when both CVP

NOTE Confidence: 0.94206977

00:15:03.050 --> 00:15:04.490 and wedge are elevated. And

NOTE Confidence: 0.94206977

00:15:04.490 --> 00:15:06.055 at the bottom left is

NOTE Confidence: 0.94206977

00:15:06.055 --> 00:15:07.495 kind of a uvelemic where

NOTE Confidence: 0.94206977

00:15:07.495 --> 00:15:08.634 neither are elevated

NOTE Confidence: 0.89350146

00:15:09.095 --> 00:15:10.315 and you can see fully

NOTE Confidence: 0.8659875

00:15:11.334 --> 00:15:13.014 this is from the all

NOTE Confidence: 0.8659875

00:15:13.014 --> 00:15:14.935 comers both heart failure and

NOTE Confidence: 0.8659875

00:15:14.935 --> 00:15:16.695 AMI shock. Fifty percent of

NOTE Confidence: 0.8659875

00:15:16.695 --> 00:15:19.274 patients present with bilateral congestion,

NOTE Confidence: 0.9687959

00:15:19.949 --> 00:15:21.629 about twenty five percent present

NOTE Confidence: 0.9687959

00:15:21.629 --> 00:15:23.329 with isolated left sided congestion,

NOTE Confidence: 0.98091197

00:15:23.790 --> 00:15:25.470 and about twenty percent present

NOTE Confidence: 0.98091197

00:15:25.470 --> 00:15:26.610 in this kind of euvolemic

NOTE Confidence: 0.98091197

00:15:26.829 --> 00:15:28.189 state. And one thing that

NOTE Confidence: 0.98091197

00:15:28.189 --> 00:15:29.870 was very interesting and maybe

NOTE Confidence: 0.98091197

00:15:29.870 --> 00:15:30.589 a little bit of a

NOTE Confidence: 0.98091197

00:15:30.589 --> 00:15:31.089 surprise

NOTE Confidence: 0.9658222

00:15:31.550 --> 00:15:32.430 is that one of the

NOTE Confidence: 0.9658222

00:15:32.430 --> 00:15:33.949 things that the power the

NOTE Confidence: 0.9658222

00:15:33.949 --> 00:15:35.250 most powerful of these

NOTE Confidence: 0.93426245

00:15:36.725 --> 00:15:37.785 indexes that

NOTE Confidence: 0.8856772

00:15:38.245 --> 00:15:38.985 are prognostic

NOTE Confidence: 0.9690193

00:15:39.525 --> 00:15:40.805 is actually the central venous

NOTE Confidence: 0.9690193

00:15:40.805 --> 00:15:41.945 pressure, the CVP.

NOTE Confidence: 0.9662164

00:15:42.965 --> 00:15:44.645 If the patient present with

NOTE Confidence: 0.9662164

00:15:44.645 --> 00:15:46.745 either isolated right sided congestion

NOTE Confidence: 0.9662164

00:15:46.805 --> 00:15:48.025 or bilateral congestion,

NOTE Confidence: 0.9993194

00:15:48.485 --> 00:15:50.425 the mortality is twice that

NOTE Confidence: 0.93665165

00:15:50.740 --> 00:15:52.500 as whether, as when the

NOTE Confidence: 0.93665165

00:15:52.500 --> 00:15:54.200 central venous pressure is normal

NOTE Confidence: 0.93665165

00:15:54.340 --> 00:15:55.300 and that cut off there

NOTE Confidence: 0.93665165

00:15:55.300 --> 00:15:56.500 was only twelve millimeters of

NOTE Confidence: 0.93665165

00:15:56.500 --> 00:15:57.940 mercury for CVP, so not

NOTE Confidence: 0.93665165

00:15:57.940 --> 00:15:58.680 very elevated.

NOTE Confidence: 0.9909296

00:15:59.220 --> 00:16:00.180 The other two things that

NOTE Confidence: 0.9909296

00:16:00.180 --> 00:16:00.920 we saw,

NOTE Confidence: 0.9741885

00:16:01.300 --> 00:16:02.820 that have come true in

NOTE Confidence: 0.9741885

00:16:02.820 --> 00:16:04.875 most registries, number one, is

NOTE Confidence: 0.9741885

00:16:04.875 --> 00:16:06.315 that we divide this into

NOTE Confidence: 0.9741885

00:16:06.315 --> 00:16:07.675 AMI shock and heart failure

NOTE Confidence: 0.9741885

00:16:07.675 --> 00:16:09.935 shock. Patients with AMI shock

NOTE Confidence: 0.9741885

00:16:10.075 --> 00:16:11.195 tend to have a much

NOTE Confidence: 0.9741885

00:16:11.195 --> 00:16:12.795 higher mortality than patients with

NOTE Confidence: 0.9741885

00:16:12.795 --> 00:16:13.995 heart failure shock. That comes

NOTE Confidence: 0.9741885

00:16:13.995 --> 00:16:15.775 through in almost all registries.

NOTE Confidence: 0.9651699

00:16:16.955 --> 00:16:18.315 And so everything that we

NOTE Confidence: 0.9651699

00:16:18.315 --> 00:16:19.375 learn about shock,

NOTE Confidence: 0.98596287

00:16:19.870 --> 00:16:22.110 which is mainly from AMI

NOTE Confidence: 0.98596287

00:16:22.110 --> 00:16:23.950 shock, do not apply one

NOTE Confidence: 0.98596287

00:16:23.950 --> 00:16:25.870 to one to, patients who

NOTE Confidence: 0.98596287

00:16:25.870 --> 00:16:27.070 have heart failure shock. These

NOTE Confidence: 0.98596287

00:16:27.070 --> 00:16:27.730 are different

NOTE Confidence: 0.93347716

00:16:28.110 --> 00:16:29.150 entities, if you will. They're

NOTE Confidence: 0.93347716

00:16:29.150 --> 00:16:30.510 not completely different, but there's

NOTE Confidence: 0.93347716

00:16:30.510 --> 00:16:31.730 a lot of unique features,

NOTE Confidence: 0.93347716

00:16:31.950 --> 00:16:33.390 and we're barely scratching the

NOTE Confidence: 0.93347716

00:16:33.390 --> 00:16:35.165 surface and understanding about heart

NOTE Confidence: 0.93347716

00:16:35.165 --> 00:16:36.685 failure shock and how to

NOTE Confidence: 0.93347716

00:16:36.685 --> 00:16:37.425 treat it.

NOTE Confidence: 0.944256

00:16:38.125 --> 00:16:39.005 And the other thing is

NOTE Confidence: 0.944256

00:16:39.005 --> 00:16:40.525 so this this trend for

NOTE Confidence: 0.944256

00:16:40.525 --> 00:16:42.225 CVP to be, very,

NOTE Confidence: 0.8480925

00:16:42.925 --> 00:16:43.425 modulate,

NOTE Confidence: 0.9389395

00:16:43.805 --> 00:16:46.125 prognosis is, is present in

NOTE Confidence: 0.9389395

00:16:46.125 --> 00:16:47.425 both forms of shock.

NOTE Confidence: 0.9289501

00:16:48.080 --> 00:16:49.540 Now in terms of therapies,

NOTE Confidence: 0.9289501

00:16:49.760 --> 00:16:51.280 we have drugs, you know,

NOTE Confidence: 0.9289501

00:16:51.280 --> 00:16:52.240 the drugs, you know what

NOTE Confidence: 0.9289501

00:16:52.240 --> 00:16:53.920 they do, and we have

NOTE Confidence: 0.9289501

00:16:53.920 --> 00:16:54.420 devices,

NOTE Confidence: 0.8929464

00:16:55.280 --> 00:16:56.500 you know, all the devices

NOTE Confidence: 0.8929464

00:16:56.560 --> 00:16:58.420 we have now more options

NOTE Confidence: 0.8929464

00:16:58.560 --> 00:16:59.840 now for right sided support.

NOTE Confidence: 0.8929464

00:16:59.840 --> 00:17:01.200 We have VA ECMO balloon

NOTE Confidence: 0.8929464

00:17:01.200 --> 00:17:01.700 pumping

NOTE Confidence: 0.9433854

00:17:02.175 --> 00:17:04.335 and, two two major forms

NOTE Confidence: 0.9433854

00:17:04.335 --> 00:17:04.655 of,

NOTE Confidence: 0.89946103

00:17:05.215 --> 00:17:07.234 micro axial flow, pumps.

NOTE Confidence: 0.99212676

00:17:07.855 --> 00:17:08.975 But if we start now

NOTE Confidence: 0.99212676

00:17:08.975 --> 00:17:10.035 looking at the evidence,

NOTE Confidence: 0.94193673

00:17:10.415 --> 00:17:11.615 and how to treat patients

NOTE Confidence: 0.94193673

00:17:11.615 --> 00:17:12.975 with shock, we're really,

NOTE Confidence: 0.9992385

00:17:13.375 --> 00:17:14.575 not in a really great

NOTE Confidence: 0.9992385

00:17:14.575 --> 00:17:15.075 place.

NOTE Confidence: 0.92341304

00:17:15.590 --> 00:17:16.869 So these are a list

NOTE Confidence: 0.92341304

00:17:16.869 --> 00:17:18.790 of the, the key randomized

NOTE Confidence: 0.92341304

00:17:18.790 --> 00:17:20.310 trials that have performed. Of

NOTE Confidence: 0.92341304

00:17:20.310 --> 00:17:21.910 course, the initial one was

NOTE Confidence: 0.92341304

00:17:21.910 --> 00:17:23.109 the shock trial led by

NOTE Confidence: 0.92341304

00:17:23.109 --> 00:17:24.890 Judy Hockman, a NIH study,

NOTE Confidence: 0.9777817

00:17:25.270 --> 00:17:26.390 and I'm not not a

NOTE Confidence: 0.9777817

00:17:26.390 --> 00:17:27.910 lot of people really remember,

NOTE Confidence: 0.9777817

00:17:27.910 --> 00:17:28.950 but that was a negative

NOTE Confidence: 0.9777817

00:17:28.950 --> 00:17:30.305 trial if you go by

NOTE Confidence: 0.9777817

00:17:30.305 --> 00:17:31.525 the primary endpoint.

NOTE Confidence: 0.9772949

00:17:32.305 --> 00:17:33.685 It became positive

NOTE Confidence: 0.89048386

00:17:34.065 --> 00:17:35.505 with longer term follow-up, but

NOTE Confidence: 0.89048386

00:17:35.505 --> 00:17:36.545 to the these by today's

NOTE Confidence: 0.89048386

00:17:36.545 --> 00:17:37.905 standards, this would be considered

NOTE Confidence: 0.89048386

00:17:37.905 --> 00:17:38.405 a,

NOTE Confidence: 0.93179756

00:17:39.105 --> 00:17:40.885 a, hypothesis generating,

NOTE Confidence: 0.99901175

00:17:41.905 --> 00:17:42.405 observation.

NOTE Confidence: 0.9615714

00:17:43.279 --> 00:17:44.880 From there, we've got the

NOTE Confidence: 0.9615714

00:17:44.880 --> 00:17:46.720 IBP shock two trial that

NOTE Confidence: 0.9615714

00:17:46.720 --> 00:17:47.840 killed the balloon pump in

NOTE Confidence: 0.9615714

00:17:47.840 --> 00:17:48.880 Europe, but not in the

NOTE Confidence: 0.9615714

00:17:48.880 --> 00:17:49.919 United States. We have the

NOTE Confidence: 0.9615714

00:17:49.919 --> 00:17:51.840 corporate shock trial that that

NOTE Confidence: 0.9615714

00:17:51.840 --> 00:17:53.139 said that you should only,

NOTE Confidence: 0.9052725

00:17:53.519 --> 00:17:54.019 revascularize

NOTE Confidence: 0.8203876

00:17:54.880 --> 00:17:57.359 the corporate artery in, AMI

NOTE Confidence: 0.8203876

00:17:57.359 --> 00:17:58.705 shock. We have the DO

NOTE Confidence: 0.8203876

00:17:58.705 --> 00:17:59.684 RE MI trial,

NOTE Confidence: 0.9314876

00:18:00.304 --> 00:18:01.184 which said that there was

NOTE Confidence: 0.9314876

00:18:01.184 --> 00:18:02.865 no difference between milrinone and

NOTE Confidence: 0.9314876

00:18:02.865 --> 00:18:03.365 dobutamine.

NOTE Confidence: 0.9200828

00:18:04.304 --> 00:18:06.065 We've had the ECMO shock,

NOTE Confidence: 0.9200828

00:18:06.065 --> 00:18:06.565 ECMO

NOTE Confidence: 0.8827542

00:18:06.865 --> 00:18:08.644 cardiogenic shock and the ECLS

NOTE Confidence: 0.8827542

00:18:08.784 --> 00:18:10.404 shock which said that

NOTE Confidence: 0.9635207

00:18:12.210 --> 00:18:13.429 that the use of ECMO

NOTE Confidence: 0.9635207

00:18:13.490 --> 00:18:15.429 does not impact on mortality.

NOTE Confidence: 0.9953216

00:18:16.289 --> 00:18:16.789 And

NOTE Confidence: 0.8372778

00:18:17.570 --> 00:18:19.169 most recently we have the

NOTE Confidence: 0.8372778

00:18:19.169 --> 00:18:21.409 danger shock trial which is

NOTE Confidence: 0.8372778

00:18:21.409 --> 00:18:21.909 really

NOTE Confidence: 0.85245913

00:18:22.289 --> 00:18:23.590 the study of the Impella

NOTE Confidence: 0.85245913

00:18:23.650 --> 00:18:24.150 CP,

NOTE Confidence: 0.96224844

00:18:25.010 --> 00:18:26.630 which is really the only

NOTE Confidence: 0.96224844

00:18:26.865 --> 00:18:28.225 if I can say, positive

NOTE Confidence: 0.96224844

00:18:28.225 --> 00:18:29.984 trial that from, you know,

NOTE Confidence: 0.96224844

00:18:29.984 --> 00:18:31.045 in terms of formality,

NOTE Confidence: 0.984407

00:18:31.825 --> 00:18:33.205 that really has guided,

NOTE Confidence: 0.89921236

00:18:33.744 --> 00:18:35.744 us has provided some, some

NOTE Confidence: 0.89921236

00:18:35.744 --> 00:18:36.244 guidance.

NOTE Confidence: 0.98215204

00:18:37.505 --> 00:18:39.025 Just as a reminder, the

NOTE Confidence: 0.98215204

00:18:39.025 --> 00:18:40.304 danger shock trial was a

NOTE Confidence: 0.98215204

00:18:40.304 --> 00:18:41.365 randomized trial

NOTE Confidence: 0.96058714

00:18:42.720 --> 00:18:43.540 with Impella

NOTE Confidence: 0.9441091

00:18:43.920 --> 00:18:45.520 with a suggestion of how

NOTE Confidence: 0.9441091

00:18:45.520 --> 00:18:46.720 the patient should treat should

NOTE Confidence: 0.9441091

00:18:46.720 --> 00:18:48.000 be treated, but not really

NOTE Confidence: 0.9441091

00:18:48.000 --> 00:18:49.220 very strictly enforced

NOTE Confidence: 0.9347485

00:18:49.680 --> 00:18:50.740 versus a control

NOTE Confidence: 0.9271474

00:18:51.040 --> 00:18:52.640 group, that did not get

NOTE Confidence: 0.9271474

00:18:52.640 --> 00:18:54.000 Impella and also they did

NOTE Confidence: 0.9271474

00:18:54.000 --> 00:18:55.220 not have balloon pump.

NOTE Confidence: 0.93882877

00:18:55.635 --> 00:18:57.315 By this time the, and

NOTE Confidence: 0.93882877

00:18:57.315 --> 00:18:58.515 this was done in Germany

NOTE Confidence: 0.93882877

00:18:58.515 --> 00:19:00.435 and and, Denmark. The balloon

NOTE Confidence: 0.93882877

00:19:00.435 --> 00:19:01.635 pump was really not used

NOTE Confidence: 0.93882877

00:19:01.635 --> 00:19:02.935 in those countries anymore.

NOTE Confidence: 0.93091196

00:19:04.115 --> 00:19:05.895 And again, with the suggestion

NOTE Confidence: 0.93091196

00:19:05.955 --> 00:19:07.234 of what to do, but

NOTE Confidence: 0.93091196

00:19:07.234 --> 00:19:08.455 it was not the protocol

NOTE Confidence: 0.93091196

00:19:08.595 --> 00:19:10.195 was not really enforced. So

NOTE Confidence: 0.93091196

00:19:10.195 --> 00:19:11.015 it was really,

NOTE Confidence: 0.95165145

00:19:11.619 --> 00:19:13.000 you know, at the discretion

NOTE Confidence: 0.95165145

00:19:13.059 --> 00:19:14.260 of the treating physician how

NOTE Confidence: 0.95165145

00:19:14.260 --> 00:19:15.380 to treat the patients once

NOTE Confidence: 0.95165145

00:19:15.380 --> 00:19:16.600 they either got the Impella

NOTE Confidence: 0.95165145

00:19:16.820 --> 00:19:17.799 or were randomized.

NOTE Confidence: 0.9725774

00:19:18.980 --> 00:19:20.580 Ten years to enroll three

NOTE Confidence: 0.9725774

00:19:20.580 --> 00:19:21.799 hundred and sixty patients

NOTE Confidence: 0.8814641

00:19:22.260 --> 00:19:24.100 and, the study had a

NOTE Confidence: 0.8814641

00:19:24.100 --> 00:19:25.559 very had a p value

NOTE Confidence: 0.9660467

00:19:25.955 --> 00:19:27.555 of point o four. It

NOTE Confidence: 0.9660467

00:19:27.555 --> 00:19:28.775 was right on the borderline

NOTE Confidence: 0.9660467

00:19:28.835 --> 00:19:29.815 of being significant,

NOTE Confidence: 0.99885434

00:19:30.835 --> 00:19:31.655 with a

NOTE Confidence: 0.9393824

00:19:32.035 --> 00:19:34.375 twelve point seven percent absolute

NOTE Confidence: 0.9393824

00:19:34.435 --> 00:19:36.435 reduction at six months. At

NOTE Confidence: 0.9393824

00:19:36.435 --> 00:19:37.395 thirty days, it would have

NOTE Confidence: 0.9393824

00:19:37.395 --> 00:19:38.615 been a neutral trial,

NOTE Confidence: 0.9620505

00:19:38.970 --> 00:19:39.850 but it also had a

NOTE Confidence: 0.9620505

00:19:39.850 --> 00:19:41.690 very low fragility index meaning

NOTE Confidence: 0.9620505

00:19:41.690 --> 00:19:42.669 if four patients

NOTE Confidence: 0.96434456

00:19:43.049 --> 00:19:44.030 move from one

NOTE Confidence: 0.9399944

00:19:44.570 --> 00:19:46.169 one group to a success

NOTE Confidence: 0.9399944

00:19:46.169 --> 00:19:48.169 to a, a failure, the

NOTE Confidence: 0.9399944

00:19:48.169 --> 00:19:49.210 true the trial would have

NOTE Confidence: 0.9399944

00:19:49.210 --> 00:19:51.130 been completely negative. So this

NOTE Confidence: 0.9399944

00:19:51.130 --> 00:19:52.730 is considered I mean it

NOTE Confidence: 0.9399944

00:19:52.730 --> 00:19:54.475 is a landmark trial, but

NOTE Confidence: 0.9399944

00:19:54.475 --> 00:19:56.234 it's it really hinges hinges

NOTE Confidence: 0.9399944

00:19:56.234 --> 00:19:57.195 on a very few,

NOTE Confidence: 0.93900806

00:19:57.674 --> 00:19:59.274 observations. And in fact, if

NOTE Confidence: 0.93900806

00:19:59.274 --> 00:20:00.315 you looked at the intent,

NOTE Confidence: 0.93900806

00:20:00.394 --> 00:20:01.355 this is the intent to

NOTE Confidence: 0.93900806

00:20:01.355 --> 00:20:02.715 treat analysis. But if you

NOTE Confidence: 0.93900806

00:20:02.715 --> 00:20:03.695 look at the protocol

NOTE Confidence: 0.9869983

00:20:04.394 --> 00:20:05.754 analysis, it was actually a

NOTE Confidence: 0.9869983

00:20:05.754 --> 00:20:07.375 neutral a neutral trial.

NOTE Confidence: 0.8758475

00:20:07.850 --> 00:20:08.970 And of course use of

NOTE Confidence: 0.8758475

00:20:08.970 --> 00:20:11.050 Impella versus no device, there

NOTE Confidence: 0.8758475

00:20:11.050 --> 00:20:12.570 were adverse events or were

NOTE Confidence: 0.8758475

00:20:12.570 --> 00:20:13.390 much higher.

NOTE Confidence: 0.99388707

00:20:13.690 --> 00:20:15.369 But despite the the increase

NOTE Confidence: 0.99388707

00:20:15.369 --> 00:20:16.430 in adverse events,

NOTE Confidence: 0.9784952

00:20:17.050 --> 00:20:18.170 you know, there still was

NOTE Confidence: 0.9784952

00:20:18.170 --> 00:20:19.310 a survival benefit

NOTE Confidence: 0.95157456

00:20:19.770 --> 00:20:20.170 that,

NOTE Confidence: 0.93538874

00:20:20.570 --> 00:20:21.850 that appears to,

NOTE Confidence: 0.9790843

00:20:22.435 --> 00:20:24.035 persist over longer periods of

NOTE Confidence: 0.9790843

00:20:24.035 --> 00:20:24.535 time.

NOTE Confidence: 0.9816963

00:20:24.915 --> 00:20:26.615 This appeared late last year

NOTE Confidence: 0.9816963

00:20:26.755 --> 00:20:28.035 in New England Journal, but

NOTE Confidence: 0.9816963

00:20:28.035 --> 00:20:29.475 I really would highlight look

NOTE Confidence: 0.9816963

00:20:29.475 --> 00:20:30.435 at the small number of

NOTE Confidence: 0.9816963

00:20:30.435 --> 00:20:31.715 patients that we're dealing with

NOTE Confidence: 0.9816963

00:20:31.715 --> 00:20:32.755 as we get out past

NOTE Confidence: 0.9816963

00:20:32.755 --> 00:20:34.195 one year. So we, you

NOTE Confidence: 0.9816963

00:20:34.195 --> 00:20:35.315 know, we're still even though

NOTE Confidence: 0.9816963

00:20:35.315 --> 00:20:36.515 this is a positive trial,

NOTE Confidence: 0.9816963

00:20:36.515 --> 00:20:38.135 we'll still a little bit

NOTE Confidence: 0.9816963

00:20:38.320 --> 00:20:38.720 on,

NOTE Confidence: 0.9938864

00:20:39.280 --> 00:20:40.420 on shaky grounds.

NOTE Confidence: 0.9584428

00:20:41.040 --> 00:20:42.560 There have been about ten

NOTE Confidence: 0.9584428

00:20:42.560 --> 00:20:43.680 more papers that have been

NOTE Confidence: 0.9584428

00:20:43.680 --> 00:20:45.540 published, secondary analysis

NOTE Confidence: 0.9853753

00:20:46.160 --> 00:20:46.640 of the,

NOTE Confidence: 0.9132867

00:20:47.200 --> 00:20:49.300 of the, danger shock trial.

NOTE Confidence: 0.95857686

00:20:49.680 --> 00:20:51.040 And I won't go into

NOTE Confidence: 0.95857686

00:20:51.040 --> 00:20:51.940 all of these,

NOTE Confidence: 0.8619813

00:20:52.575 --> 00:20:53.315 in detail,

NOTE Confidence: 0.95333827

00:20:54.095 --> 00:20:55.054 other than to say that,

NOTE Confidence: 0.95333827

00:20:55.054 --> 00:20:56.355 you know, there is significant

NOTE Confidence: 0.95333827

00:20:56.494 --> 00:20:56.994 understanding,

NOTE Confidence: 0.970002

00:20:57.455 --> 00:20:59.455 you know, interesting observations about

NOTE Confidence: 0.970002

00:20:59.455 --> 00:20:59.955 age,

NOTE Confidence: 0.99808097

00:21:00.575 --> 00:21:01.075 about

NOTE Confidence: 0.88101774

00:21:01.455 --> 00:21:02.835 the ability to

NOTE Confidence: 0.9269021

00:21:04.015 --> 00:21:05.054 to reduce the use of

NOTE Confidence: 0.9269021

00:21:05.054 --> 00:21:05.554 inotropes

NOTE Confidence: 0.69905126

00:21:06.255 --> 00:21:07.155 during shock.

NOTE Confidence: 0.931438

00:21:09.020 --> 00:21:11.100 That use of Impella earlier

NOTE Confidence: 0.931438

00:21:11.100 --> 00:21:12.140 in the course is is

NOTE Confidence: 0.931438

00:21:12.140 --> 00:21:12.800 more favorable,

NOTE Confidence: 0.95774657

00:21:13.980 --> 00:21:15.340 and that all despite the

NOTE Confidence: 0.95774657

00:21:15.340 --> 00:21:16.960 adverse events the long term

NOTE Confidence: 0.95774657

00:21:17.180 --> 00:21:17.680 effects

NOTE Confidence: 0.9393616

00:21:18.220 --> 00:21:18.700 were

NOTE Confidence: 0.8829366

00:21:19.020 --> 00:21:20.700 you know were still observed

NOTE Confidence: 0.8829366

00:21:20.700 --> 00:21:22.300 and these papers are now

NOTE Confidence: 0.8829366

00:21:22.300 --> 00:21:24.295 coming out little by little

NOTE Confidence: 0.8829366

00:21:24.355 --> 00:21:26.215 and they're readily available.

NOTE Confidence: 0.9619961

00:21:26.915 --> 00:21:28.295 So what about the guidelines?

NOTE Confidence: 0.92606187

00:21:28.755 --> 00:21:29.875 Where does that leave us

NOTE Confidence: 0.92606187

00:21:29.875 --> 00:21:31.975 now? So in terms of

NOTE Confidence: 0.92606187

00:21:32.035 --> 00:21:32.535 revascularization

NOTE Confidence: 0.78752697

00:21:33.395 --> 00:21:34.934 of course urgent revascularization

NOTE Confidence: 0.99369204

00:21:35.955 --> 00:21:36.695 is indicated

NOTE Confidence: 0.86802465

00:21:37.600 --> 00:21:38.960 also there because of the

NOTE Confidence: 0.86802465

00:21:38.960 --> 00:21:40.399 culprit shock trial, it is

NOTE Confidence: 0.86802465

00:21:40.399 --> 00:21:40.880 really,

NOTE Confidence: 0.99601823

00:21:41.600 --> 00:21:42.580 a class three

NOTE Confidence: 0.86511344

00:21:43.200 --> 00:21:45.380 indication to in to revascularize

NOTE Confidence: 0.90983367

00:21:45.840 --> 00:21:47.059 non infarct arteries.

NOTE Confidence: 0.9443222

00:21:47.359 --> 00:21:48.159 I can tell you that

NOTE Confidence: 0.9443222

00:21:48.159 --> 00:21:49.760 there's gonna be some, contra

NOTE Confidence: 0.9443222

00:21:50.080 --> 00:21:51.984 some contrary data that will

NOTE Confidence: 0.9443222

00:21:51.984 --> 00:21:53.744 probably come out at, at

NOTE Confidence: 0.9443222

00:21:53.744 --> 00:21:56.085 TCT this year and papers,

NOTE Confidence: 0.9561351

00:21:56.625 --> 00:21:58.065 because don't forget this was

NOTE Confidence: 0.9561351

00:21:58.065 --> 00:21:59.925 done in the setting without

NOTE Confidence: 0.9561351

00:22:00.065 --> 00:22:02.385 Impella support. So now imagine

NOTE Confidence: 0.9561351

00:22:02.385 --> 00:22:03.984 you have patients on Impella

NOTE Confidence: 0.9561351

00:22:03.984 --> 00:22:05.365 support. Does that change,

NOTE Confidence: 0.8532989

00:22:05.984 --> 00:22:06.330 the,

NOTE Confidence: 0.9882835

00:22:06.809 --> 00:22:08.590 your strategy for revascularization?

NOTE Confidence: 0.95137805

00:22:09.210 --> 00:22:10.570 Is it safer or even

NOTE Confidence: 0.95137805

00:22:10.570 --> 00:22:12.250 more beneficial to do multi

NOTE Confidence: 0.95137805

00:22:12.250 --> 00:22:13.149 multi vessel,

NOTE Confidence: 0.87491876

00:22:13.690 --> 00:22:14.970 PCI at the time of

NOTE Confidence: 0.87491876

00:22:14.970 --> 00:22:16.109 shock unanswered

NOTE Confidence: 0.8658142

00:22:16.730 --> 00:22:17.230 question?

NOTE Confidence: 0.9966892

00:22:18.169 --> 00:22:19.789 But in terms of MCS,

NOTE Confidence: 0.95764166

00:22:20.330 --> 00:22:21.565 there was a shift last

NOTE Confidence: 0.95764166

00:22:21.565 --> 00:22:22.845 year and these the guidelines

NOTE Confidence: 0.95764166

00:22:22.845 --> 00:22:24.045 that came out where,

NOTE Confidence: 0.93131196

00:22:24.685 --> 00:22:26.365 use of Impella became a

NOTE Confidence: 0.93131196

00:22:26.365 --> 00:22:28.385 two way in selected patients

NOTE Confidence: 0.9297848

00:22:28.845 --> 00:22:30.445 and balloon pump and ECMO

NOTE Confidence: 0.9297848

00:22:30.445 --> 00:22:32.045 were were downgraded to a

NOTE Confidence: 0.9297848

00:22:32.045 --> 00:22:32.545 three,

NOTE Confidence: 0.9815809

00:22:33.565 --> 00:22:34.925 not to be used in,

NOTE Confidence: 0.918757

00:22:35.405 --> 00:22:37.030 in as routine. So the

NOTE Confidence: 0.918757

00:22:37.030 --> 00:22:39.290 key here is the key

NOTE Confidence: 0.918757

00:22:39.350 --> 00:22:41.350 phrases here are in selected

NOTE Confidence: 0.918757

00:22:41.350 --> 00:22:42.890 patients to use,

NOTE Confidence: 0.9532786

00:22:43.430 --> 00:22:45.190 Impella and with regard to

NOTE Confidence: 0.9532786

00:22:45.190 --> 00:22:47.190 balloon pump and ECMO, it's

NOTE Confidence: 0.9532786

00:22:47.190 --> 00:22:48.490 don't use it in routinely.

NOTE Confidence: 0.9461844

00:22:48.950 --> 00:22:50.150 And actually, if you really

NOTE Confidence: 0.9461844

00:22:50.150 --> 00:22:51.430 dissect this, they're saying the

NOTE Confidence: 0.9461844

00:22:51.430 --> 00:22:53.484 same thing. Don't use Impella

NOTE Confidence: 0.9461844

00:22:53.484 --> 00:22:54.845 in every use Impella in

NOTE Confidence: 0.9461844

00:22:54.845 --> 00:22:56.365 selected patients and don't use

NOTE Confidence: 0.9461844

00:22:56.365 --> 00:22:57.645 balloon pump and ECMO in

NOTE Confidence: 0.9461844

00:22:57.645 --> 00:22:59.244 every patient. It's just saying

NOTE Confidence: 0.9461844

00:22:59.244 --> 00:23:00.525 the same thing. So it

NOTE Confidence: 0.9461844

00:23:00.525 --> 00:23:02.045 was really all about how

NOTE Confidence: 0.9461844

00:23:02.045 --> 00:23:03.325 the trials were designed and

NOTE Confidence: 0.9461844

00:23:03.325 --> 00:23:04.684 what the primary endpoints were

NOTE Confidence: 0.9461844

00:23:04.684 --> 00:23:05.825 and how they were interpreted

NOTE Confidence: 0.9973127

00:23:06.169 --> 00:23:07.609 that made a difference between

NOTE Confidence: 0.9973127

00:23:07.609 --> 00:23:08.109 being

NOTE Confidence: 0.81648374

00:23:08.570 --> 00:23:09.929 a a three, a class

NOTE Confidence: 0.81648374

00:23:09.929 --> 00:23:11.049 three and being a class

NOTE Confidence: 0.81648374

00:23:11.049 --> 00:23:11.789 two a.

NOTE Confidence: 0.9549211

00:23:12.090 --> 00:23:13.130 So as we know, I

NOTE Confidence: 0.9549211

00:23:13.130 --> 00:23:14.169 mean here in the United

NOTE Confidence: 0.9549211

00:23:14.169 --> 00:23:15.950 States balloon pump is still

NOTE Confidence: 0.912821

00:23:16.409 --> 00:23:18.029 the number one device used,

NOTE Confidence: 0.912821

00:23:18.090 --> 00:23:19.929 ECMO is widely used. In

NOTE Confidence: 0.912821

00:23:19.929 --> 00:23:21.985 fact after most negative ECMO

NOTE Confidence: 0.912821

00:23:22.045 --> 00:23:23.744 studies, even VV, NVA,

NOTE Confidence: 0.80537623

00:23:24.205 --> 00:23:25.505 after negatives trials,

NOTE Confidence: 0.87439156

00:23:25.805 --> 00:23:28.145 ECMO use increased not decreased,

NOTE Confidence: 0.9953985

00:23:28.605 --> 00:23:29.725 in the face of negative

NOTE Confidence: 0.9953985

00:23:29.725 --> 00:23:30.225 trials.

NOTE Confidence: 0.9243856

00:23:31.645 --> 00:23:32.145 So,

NOTE Confidence: 0.9909344

00:23:33.005 --> 00:23:34.820 what about so how selected,

NOTE Confidence: 0.99664086

00:23:35.679 --> 00:23:36.640 should we be here? This

NOTE Confidence: 0.99664086

00:23:36.640 --> 00:23:37.299 is from,

NOTE Confidence: 0.92707294

00:23:37.919 --> 00:23:39.039 the c three t n

NOTE Confidence: 0.92707294

00:23:39.039 --> 00:23:39.539 database.

NOTE Confidence: 0.9795523

00:23:39.919 --> 00:23:41.039 They did an analysis of

NOTE Confidence: 0.9795523

00:23:41.039 --> 00:23:42.740 how many patients would fit

NOTE Confidence: 0.9795523

00:23:42.880 --> 00:23:44.900 the danger shock trial criteria.

NOTE Confidence: 0.95765704

00:23:45.520 --> 00:23:45.760 And,

NOTE Confidence: 0.9171378

00:23:46.744 --> 00:23:48.105 so this, the the the,

NOTE Confidence: 0.9767352

00:23:49.065 --> 00:23:50.505 the critical care network is

NOTE Confidence: 0.9767352

00:23:50.505 --> 00:23:51.865 looking at everything in critical

NOTE Confidence: 0.9767352

00:23:51.865 --> 00:23:52.685 care cardiology,

NOTE Confidence: 0.94726634

00:23:53.145 --> 00:23:54.665 not just not just shock,

NOTE Confidence: 0.94726634

00:23:54.665 --> 00:23:56.505 but among the the twenty

NOTE Confidence: 0.94726634

00:23:56.505 --> 00:23:58.505 thousand admissions, there were seven

NOTE Confidence: 0.94726634

00:23:58.505 --> 00:23:59.850 hundred and fifty seven

NOTE Confidence: 0.93809175

00:24:00.250 --> 00:24:02.490 STEMIs in cardiogenic shock and

NOTE Confidence: 0.93809175

00:24:02.490 --> 00:24:03.470 among those

NOTE Confidence: 0.96059275

00:24:03.850 --> 00:24:05.369 about thirty two percent were

NOTE Confidence: 0.96059275

00:24:05.369 --> 00:24:06.730 eligible. But of all the

NOTE Confidence: 0.96059275

00:24:06.730 --> 00:24:08.970 cardiogenic shock only five percent

NOTE Confidence: 0.96059275

00:24:08.970 --> 00:24:10.090 of patients who present with

NOTE Confidence: 0.96059275

00:24:10.090 --> 00:24:12.190 cardiogenic shock meet the criteria

NOTE Confidence: 0.960122

00:24:13.184 --> 00:24:14.644 that that is the selected.

NOTE Confidence: 0.960122

00:24:14.784 --> 00:24:16.385 That's how selective it is.

NOTE Confidence: 0.960122

00:24:16.385 --> 00:24:17.184 So we have a long

NOTE Confidence: 0.960122

00:24:17.184 --> 00:24:18.005 way to go.

NOTE Confidence: 0.99857676

00:24:18.465 --> 00:24:18.965 Now

NOTE Confidence: 0.9344651

00:24:19.424 --> 00:24:20.784 we know that the treatment

NOTE Confidence: 0.9344651

00:24:20.784 --> 00:24:22.544 of patients with cardiogenic shock

NOTE Confidence: 0.9344651

00:24:22.544 --> 00:24:24.784 is extremely complicated, involves many

NOTE Confidence: 0.9344651

00:24:24.784 --> 00:24:26.005 many aspects

NOTE Confidence: 0.9345663

00:24:26.385 --> 00:24:27.825 and these are this is

NOTE Confidence: 0.9345663

00:24:27.825 --> 00:24:28.890 a list of things things

NOTE Confidence: 0.9345663

00:24:28.890 --> 00:24:30.350 that were, that were

NOTE Confidence: 0.918119

00:24:30.730 --> 00:24:32.650 identified by the cardiac, cardiac

NOTE Confidence: 0.918119

00:24:32.650 --> 00:24:34.890 safety research consort consortium think

NOTE Confidence: 0.918119

00:24:34.890 --> 00:24:36.350 tank as unresolved

NOTE Confidence: 0.96629864

00:24:36.730 --> 00:24:37.770 issues that need to be

NOTE Confidence: 0.96629864

00:24:37.770 --> 00:24:39.290 addressed. I'm not gonna go

NOTE Confidence: 0.96629864

00:24:39.290 --> 00:24:40.650 through this list, but even

NOTE Confidence: 0.96629864

00:24:40.650 --> 00:24:41.770 not even not even on

NOTE Confidence: 0.96629864

00:24:41.770 --> 00:24:43.155 this list was what's how

NOTE Confidence: 0.96629864

00:24:43.155 --> 00:24:44.515 do you treat STEMI versus

NOTE Confidence: 0.96629864

00:24:44.515 --> 00:24:45.795 NSTEMI? And how do you

NOTE Confidence: 0.96629864

00:24:45.795 --> 00:24:47.095 treat heart failure shock?

NOTE Confidence: 0.9125353

00:24:47.555 --> 00:24:49.235 And within heart failure shock

NOTE Confidence: 0.9125353

00:24:49.235 --> 00:24:50.355 we have de novo shock

NOTE Confidence: 0.9125353

00:24:50.355 --> 00:24:51.315 and we have patients who

NOTE Confidence: 0.9125353

00:24:51.315 --> 00:24:52.055 are chronic

NOTE Confidence: 0.8359582

00:24:52.755 --> 00:24:53.255 decompensated,

NOTE Confidence: 0.98022527

00:24:53.955 --> 00:24:55.494 shock and many other questions.

NOTE Confidence: 0.9986788

00:24:56.040 --> 00:24:57.000 So these are all the

NOTE Confidence: 0.9986788

00:24:57.000 --> 00:24:58.300 things that we have to

NOTE Confidence: 0.8792104

00:24:58.600 --> 00:24:59.960 as you as as clinicians

NOTE Confidence: 0.8792104

00:24:59.960 --> 00:25:01.320 treating these patients really have

NOTE Confidence: 0.8792104

00:25:01.320 --> 00:25:03.160 to grapple with on a

NOTE Confidence: 0.8792104

00:25:03.160 --> 00:25:04.540 daily basis and

NOTE Confidence: 0.967452

00:25:05.400 --> 00:25:06.600 obviously we're not gonna be

NOTE Confidence: 0.967452

00:25:06.600 --> 00:25:07.480 able to answer all of

NOTE Confidence: 0.967452

00:25:07.480 --> 00:25:08.600 these in the context of

NOTE Confidence: 0.967452

00:25:08.600 --> 00:25:09.740 randomized trials.

NOTE Confidence: 0.96706706

00:25:10.425 --> 00:25:12.205 So ongoing now there are

NOTE Confidence: 0.96706706

00:25:12.345 --> 00:25:12.845 currently

NOTE Confidence: 0.96709156

00:25:13.865 --> 00:25:16.445 eighteen ongoing randomized trials

NOTE Confidence: 0.9593614

00:25:16.745 --> 00:25:18.665 that looking at various forms

NOTE Confidence: 0.9593614

00:25:18.665 --> 00:25:19.325 of MCS.

NOTE Confidence: 0.59380454

00:25:21.305 --> 00:25:21.805 Again

NOTE Confidence: 0.8882854

00:25:22.105 --> 00:25:24.365 about multi vessel versus

NOTE Confidence: 0.8767245

00:25:25.359 --> 00:25:26.740 you know on support,

NOTE Confidence: 0.9980452

00:25:27.600 --> 00:25:28.740 and also other

NOTE Confidence: 0.9093439

00:25:30.000 --> 00:25:32.000 mechanical interventions in patients who

NOTE Confidence: 0.9093439

00:25:32.000 --> 00:25:33.859 have for example severe tricuspid

NOTE Confidence: 0.9093439

00:25:33.919 --> 00:25:34.419 regurgitation,

NOTE Confidence: 0.8715804

00:25:35.440 --> 00:25:37.200 inotropes and vasopressors, how should

NOTE Confidence: 0.8715804

00:25:37.200 --> 00:25:38.399 they be using a platelet

NOTE Confidence: 0.8715804

00:25:38.399 --> 00:25:39.519 agents and the use of

NOTE Confidence: 0.8715804

00:25:39.519 --> 00:25:40.980 pulmonary artery catheters.

NOTE Confidence: 0.98479664

00:25:41.655 --> 00:25:43.035 And of all of these,

NOTE Confidence: 0.96282995

00:25:43.335 --> 00:25:44.695 only one of these trials

NOTE Confidence: 0.96282995

00:25:44.695 --> 00:25:45.655 is going on in the

NOTE Confidence: 0.96282995

00:25:45.655 --> 00:25:46.935 United States and it's it's

NOTE Confidence: 0.96282995

00:25:46.935 --> 00:25:48.155 a study that we're running

NOTE Confidence: 0.96282995

00:25:48.375 --> 00:25:50.455 in the, cardiogenic shock working

NOTE Confidence: 0.96282995

00:25:50.455 --> 00:25:50.955 group,

NOTE Confidence: 0.94802386

00:25:51.815 --> 00:25:52.935 on the use of whether

NOTE Confidence: 0.94802386

00:25:52.935 --> 00:25:53.815 or not we should use

NOTE Confidence: 0.94802386

00:25:53.815 --> 00:25:55.275 pulmonary artery catheters.

NOTE Confidence: 0.9385451

00:25:55.970 --> 00:25:56.850 So I'm not gonna go

NOTE Confidence: 0.9385451

00:25:56.850 --> 00:25:57.890 through this. This is is

NOTE Confidence: 0.9385451

00:25:57.890 --> 00:25:59.250 all in this review article

NOTE Confidence: 0.9385451

00:25:59.250 --> 00:26:00.470 from Holger Teals,

NOTE Confidence: 0.9672032

00:26:00.770 --> 00:26:02.130 from last month in New

NOTE Confidence: 0.9672032

00:26:02.130 --> 00:26:03.490 England Journal. These are the

NOTE Confidence: 0.9672032

00:26:03.490 --> 00:26:05.730 actual clinical trials and I'll

NOTE Confidence: 0.9672032

00:26:05.730 --> 00:26:06.930 just I'll refer back to

NOTE Confidence: 0.9672032

00:26:06.930 --> 00:26:08.215 some of these as we

NOTE Confidence: 0.9672032

00:26:08.215 --> 00:26:09.895 move forward. But with regard

NOTE Confidence: 0.9672032

00:26:09.895 --> 00:26:10.855 to the the study that

NOTE Confidence: 0.9672032

00:26:10.855 --> 00:26:11.675 we're running,

NOTE Confidence: 0.9934099

00:26:12.455 --> 00:26:13.815 we've enrolled about a hundred

NOTE Confidence: 0.9934099

00:26:13.815 --> 00:26:14.635 and five patients

NOTE Confidence: 0.97414255

00:26:15.015 --> 00:26:15.975 with a target of four

NOTE Confidence: 0.97414255

00:26:15.975 --> 00:26:17.175 hundred over three and a

NOTE Confidence: 0.97414255

00:26:17.175 --> 00:26:17.915 half years.

NOTE Confidence: 0.9694805

00:26:18.295 --> 00:26:20.055 So obviously, this is not

NOTE Confidence: 0.9694805

00:26:20.055 --> 00:26:21.735 a way a feasible way

NOTE Confidence: 0.9694805

00:26:21.735 --> 00:26:22.875 to generate evidence

NOTE Confidence: 0.9330266

00:26:23.280 --> 00:26:24.880 that is gonna help move

NOTE Confidence: 0.9330266

00:26:24.880 --> 00:26:26.320 the field forward in a

NOTE Confidence: 0.9330266

00:26:26.320 --> 00:26:27.460 very rapid way.

NOTE Confidence: 0.95243394

00:26:28.080 --> 00:26:29.600 So in the United States,

NOTE Confidence: 0.95243394

00:26:29.600 --> 00:26:30.640 in Europe they seem to

NOTE Confidence: 0.95243394

00:26:30.640 --> 00:26:31.460 be able to do

NOTE Confidence: 0.9312088

00:26:32.160 --> 00:26:33.780 trials in shock very quickly.

NOTE Confidence: 0.9312088

00:26:33.840 --> 00:26:35.295 We cannot do them almost

NOTE Confidence: 0.9312088

00:26:35.295 --> 00:26:37.295 at all and it's because

NOTE Confidence: 0.9312088

00:26:37.295 --> 00:26:38.655 they have a different form

NOTE Confidence: 0.9312088

00:26:38.655 --> 00:26:39.875 of informed consent

NOTE Confidence: 0.9613618

00:26:40.175 --> 00:26:41.615 in, in Europe than we

NOTE Confidence: 0.9613618

00:26:41.615 --> 00:26:42.575 have here in the United

NOTE Confidence: 0.9613618

00:26:42.575 --> 00:26:44.175 States. I'm not saying which

NOTE Confidence: 0.9613618

00:26:44.175 --> 00:26:45.055 is right or wrong that's

NOTE Confidence: 0.9613618

00:26:45.055 --> 00:26:46.655 an ethical question, but I'm

NOTE Confidence: 0.9613618

00:26:46.655 --> 00:26:48.095 just saying the facts. We

NOTE Confidence: 0.9613618

00:26:48.095 --> 00:26:49.780 do have here in the

NOTE Confidence: 0.9613618

00:26:49.780 --> 00:26:51.780 United States a pathway to

NOTE Confidence: 0.9613618

00:26:51.780 --> 00:26:52.820 to mimic what they do

NOTE Confidence: 0.9613618

00:26:52.820 --> 00:26:53.859 in Europe which is called

NOTE Confidence: 0.9613618

00:26:53.859 --> 00:26:55.560 Efic, which is an exemption

NOTE Confidence: 0.9613618

00:26:55.619 --> 00:26:56.840 from informed consent.

NOTE Confidence: 0.9994926

00:26:57.140 --> 00:26:58.359 This is a very arduous

NOTE Confidence: 0.9994926

00:26:58.420 --> 00:26:59.480 process to get

NOTE Confidence: 0.84363824

00:27:00.020 --> 00:27:01.940 approved to do studies in

NOTE Confidence: 0.84363824

00:27:01.940 --> 00:27:03.080 this domain

NOTE Confidence: 0.90567654

00:27:03.460 --> 00:27:04.705 and in fact in the

NOTE Confidence: 0.90567654

00:27:04.705 --> 00:27:06.545 history of the FDA which

NOTE Confidence: 0.90567654

00:27:06.545 --> 00:27:08.465 last is about forty to

NOTE Confidence: 0.90567654

00:27:08.465 --> 00:27:10.065 fifty years, there's only been

NOTE Confidence: 0.90567654

00:27:10.065 --> 00:27:11.345 forty studies that have been

NOTE Confidence: 0.90567654

00:27:11.345 --> 00:27:13.025 done under EPIC and these

NOTE Confidence: 0.90567654

00:27:13.025 --> 00:27:14.945 are generally small trials and

NOTE Confidence: 0.90567654

00:27:14.945 --> 00:27:15.925 as you can see,

NOTE Confidence: 0.94004625

00:27:16.625 --> 00:27:17.970 the the ones where they've

NOTE Confidence: 0.94004625

00:27:17.970 --> 00:27:19.169 I mean, these are numbers.

NOTE Confidence: 0.94004625

00:27:19.169 --> 00:27:20.369 Like here, this is one

NOTE Confidence: 0.94004625

00:27:20.369 --> 00:27:21.490 one two two. So we're

NOTE Confidence: 0.94004625

00:27:21.490 --> 00:27:22.710 talking very small numbers,

NOTE Confidence: 0.9875672

00:27:23.090 --> 00:27:25.330 but, with, with traumatic brain

NOTE Confidence: 0.9875672

00:27:25.330 --> 00:27:25.830 injury,

NOTE Confidence: 0.9756933

00:27:26.130 --> 00:27:27.809 hemorrhagic shock, and out of

NOTE Confidence: 0.9756933

00:27:27.809 --> 00:27:29.570 hospital cardiac arrest is the

NOTE Confidence: 0.9756933

00:27:29.650 --> 00:27:30.530 are the ones that have

NOTE Confidence: 0.9756933

00:27:30.530 --> 00:27:31.030 received,

NOTE Confidence: 0.96246153

00:27:31.490 --> 00:27:33.285 the most, success in this,

NOTE Confidence: 0.96246153

00:27:33.525 --> 00:27:34.585 in this arena.

NOTE Confidence: 0.9967387

00:27:35.285 --> 00:27:37.125 So is it really realistic

NOTE Confidence: 0.9967387

00:27:37.125 --> 00:27:38.645 to rely on randomized trials

NOTE Confidence: 0.9967387

00:27:38.645 --> 00:27:39.705 to generate results

NOTE Confidence: 0.99713975

00:27:40.085 --> 00:27:40.984 that will significantly

NOTE Confidence: 0.9609878

00:27:41.285 --> 00:27:43.125 influence clinical practice for the

NOTE Confidence: 0.9609878

00:27:43.125 --> 00:27:44.565 care of these patients? I

NOTE Confidence: 0.9609878

00:27:44.565 --> 00:27:46.100 think the answer obviously is

NOTE Confidence: 0.9609878

00:27:46.100 --> 00:27:47.860 no. We can't, you know,

NOTE Confidence: 0.9609878

00:27:47.860 --> 00:27:48.740 at the pace that we're

NOTE Confidence: 0.9609878

00:27:48.740 --> 00:27:50.040 able to enroll patients,

NOTE Confidence: 0.9871134

00:27:50.420 --> 00:27:51.460 we're not gonna be able

NOTE Confidence: 0.9871134

00:27:51.460 --> 00:27:52.820 to do to, to do

NOTE Confidence: 0.9871134

00:27:52.820 --> 00:27:53.320 that.

NOTE Confidence: 0.9912373

00:27:53.780 --> 00:27:55.320 So what are the alternatives?

NOTE Confidence: 0.9954494

00:27:56.100 --> 00:27:56.840 The alternatives

NOTE Confidence: 0.9591941

00:27:58.575 --> 00:28:00.655 is, one question is, is

NOTE Confidence: 0.9591941

00:28:00.655 --> 00:28:02.095 there a significant role of

NOTE Confidence: 0.9591941

00:28:02.095 --> 00:28:02.595 registries

NOTE Confidence: 0.988007

00:28:03.135 --> 00:28:04.575 in advancing the care of

NOTE Confidence: 0.988007

00:28:04.575 --> 00:28:06.355 patients with cardiogenic shock?

NOTE Confidence: 0.9814363

00:28:06.895 --> 00:28:08.115 And right now,

NOTE Confidence: 0.91915226

00:28:08.575 --> 00:28:09.795 there are five,

NOTE Confidence: 0.9269528

00:28:10.380 --> 00:28:12.300 different well known registries that

NOTE Confidence: 0.9269528

00:28:12.300 --> 00:28:14.320 are that are active.

NOTE Confidence: 0.9208347

00:28:14.940 --> 00:28:16.000 There's the NCSI,

NOTE Confidence: 0.936674

00:28:16.380 --> 00:28:18.460 National Cardiogenic Shock Initiative which

NOTE Confidence: 0.936674

00:28:18.460 --> 00:28:20.240 was really the first one

NOTE Confidence: 0.936674

00:28:20.460 --> 00:28:22.140 that really kinda kicked off

NOTE Confidence: 0.936674

00:28:22.220 --> 00:28:23.200 kicked us off

NOTE Confidence: 0.9519554

00:28:23.924 --> 00:28:25.284 to to starting to collect

NOTE Confidence: 0.9519554

00:28:25.284 --> 00:28:27.524 data systematically in cardiogenic shock

NOTE Confidence: 0.9519554

00:28:27.524 --> 00:28:28.484 and I'll talk a little

NOTE Confidence: 0.9519554

00:28:28.484 --> 00:28:29.544 bit more about this

NOTE Confidence: 0.90153474

00:28:30.244 --> 00:28:31.365 in a minute because it

NOTE Confidence: 0.90153474

00:28:31.365 --> 00:28:31.865 also

NOTE Confidence: 0.8753485

00:28:33.365 --> 00:28:34.744 proposed not only

NOTE Confidence: 0.85054106

00:28:36.920 --> 00:28:38.860 not only advocate collecting data,

NOTE Confidence: 0.85054106

00:28:39.080 --> 00:28:40.680 but it also advocated how

NOTE Confidence: 0.85054106

00:28:40.680 --> 00:28:41.580 to treat patients.

NOTE Confidence: 0.9964393

00:28:42.040 --> 00:28:43.000 And I'll talk about that

NOTE Confidence: 0.9964393

00:28:43.000 --> 00:28:44.220 in detail in a second.

NOTE Confidence: 0.83601886

00:28:44.520 --> 00:28:46.620 There's the recover three registry

NOTE Confidence: 0.8407202

00:28:47.000 --> 00:28:48.300 from that Abiomed

NOTE Confidence: 0.67353475

00:28:48.760 --> 00:28:49.260 collected,

NOTE Confidence: 0.9428853

00:28:49.835 --> 00:28:50.875 And then we started the

NOTE Confidence: 0.9428853

00:28:50.875 --> 00:28:52.655 Cardiogenic Shock Working Group,

NOTE Confidence: 0.8507988

00:28:53.035 --> 00:28:54.575 which is really a mastermind

NOTE Confidence: 0.8507988

00:28:54.795 --> 00:28:56.715 and led masterfully by Navin

NOTE Confidence: 0.8507988

00:28:56.715 --> 00:28:57.215 Kapoor.

NOTE Confidence: 0.9316961

00:28:58.075 --> 00:28:59.275 And then there's the cardiac

NOTE Confidence: 0.9316961

00:28:59.275 --> 00:29:01.035 the cardiac critical care network

NOTE Confidence: 0.9316961

00:29:01.035 --> 00:29:02.395 that was launched after that

NOTE Confidence: 0.9316961

00:29:02.395 --> 00:29:03.880 and now the American Heart

NOTE Confidence: 0.9316961

00:29:03.880 --> 00:29:05.720 Association has a, has a

NOTE Confidence: 0.9316961

00:29:05.720 --> 00:29:06.940 registry that's ongoing.

NOTE Confidence: 0.9337912

00:29:07.240 --> 00:29:08.760 And these these registries we

NOTE Confidence: 0.9337912

00:29:08.760 --> 00:29:09.260 have,

NOTE Confidence: 0.90230316

00:29:09.880 --> 00:29:11.560 the the, Recover three and

NOTE Confidence: 0.90230316

00:29:11.560 --> 00:29:13.340 NCSI are relatively small.

NOTE Confidence: 0.9514314

00:29:13.640 --> 00:29:15.160 In Cardiogenic Shock Working Group,

NOTE Confidence: 0.9514314

00:29:15.160 --> 00:29:16.520 we have about fifteen to

NOTE Confidence: 0.9514314

00:29:16.520 --> 00:29:17.740 twenty thousand patients

NOTE Confidence: 0.895524

00:29:18.125 --> 00:29:19.085 and c three t n

NOTE Confidence: 0.895524

00:29:19.085 --> 00:29:20.525 and also on the range

NOTE Confidence: 0.895524

00:29:20.525 --> 00:29:21.985 of fifteen thousand patients.

NOTE Confidence: 0.97154856

00:29:22.285 --> 00:29:23.165 So there's a lot of

NOTE Confidence: 0.97154856

00:29:23.165 --> 00:29:24.305 data being collected.

NOTE Confidence: 0.9483141

00:29:25.725 --> 00:29:26.685 C three t n has

NOTE Confidence: 0.9483141

00:29:26.685 --> 00:29:27.665 started publishing.

NOTE Confidence: 0.9789696

00:29:28.125 --> 00:29:29.805 Has not published anything yet

NOTE Confidence: 0.9789696

00:29:29.805 --> 00:29:31.565 despite having about twenty thousand

NOTE Confidence: 0.9789696

00:29:31.565 --> 00:29:32.065 patients

NOTE Confidence: 0.984339

00:29:32.820 --> 00:29:34.179 and so they're now getting,

NOTE Confidence: 0.984339

00:29:34.500 --> 00:29:35.860 they're getting up and, and

NOTE Confidence: 0.984339

00:29:35.860 --> 00:29:37.059 running on that front as

NOTE Confidence: 0.984339

00:29:37.059 --> 00:29:37.559 well.

NOTE Confidence: 0.9543139

00:29:38.740 --> 00:29:39.779 So what I do wanna

NOTE Confidence: 0.9543139

00:29:39.779 --> 00:29:40.900 talk about a little about

NOTE Confidence: 0.9543139

00:29:40.900 --> 00:29:42.900 about the NCSI initiative which

NOTE Confidence: 0.9543139

00:29:42.900 --> 00:29:44.100 really did launch a lot

NOTE Confidence: 0.9543139

00:29:44.100 --> 00:29:44.679 of this

NOTE Confidence: 0.9875988

00:29:45.055 --> 00:29:46.835 And, this is the algorithm

NOTE Confidence: 0.9875988

00:29:46.895 --> 00:29:47.795 that they recommend

NOTE Confidence: 0.9736574

00:29:48.255 --> 00:29:50.515 treating patients with cardiogenic shock.

NOTE Confidence: 0.9736574

00:29:50.575 --> 00:29:51.455 And I'm not gonna go

NOTE Confidence: 0.9736574

00:29:51.455 --> 00:29:52.655 through this in detail other

NOTE Confidence: 0.9736574

00:29:52.655 --> 00:29:54.195 than to highlight three points.

NOTE Confidence: 0.95705247

00:29:54.575 --> 00:29:56.115 One, is that they advocated

NOTE Confidence: 0.95705247

00:29:56.175 --> 00:29:57.555 for early use of mechanical

NOTE Confidence: 0.95705247

00:29:57.615 --> 00:29:59.235 support specifically Impella.

NOTE Confidence: 0.9610565

00:29:59.950 --> 00:30:01.550 Two, they advocated for the

NOTE Confidence: 0.9610565

00:30:01.550 --> 00:30:02.670 use of right heart cath

NOTE Confidence: 0.9610565

00:30:02.670 --> 00:30:04.350 to guide the therapy so

NOTE Confidence: 0.9610565

00:30:04.350 --> 00:30:05.310 that you know where you

NOTE Confidence: 0.9610565

00:30:05.310 --> 00:30:05.810 are,

NOTE Confidence: 0.8977199

00:30:06.270 --> 00:30:07.470 in the therapy in in

NOTE Confidence: 0.8977199

00:30:07.470 --> 00:30:08.510 in the where the patient

NOTE Confidence: 0.8977199

00:30:08.510 --> 00:30:10.450 is in his hemodynamic status

NOTE Confidence: 0.86290175

00:30:10.830 --> 00:30:12.210 and, and lastly

NOTE Confidence: 0.7635597

00:30:12.615 --> 00:30:13.015 they,

NOTE Confidence: 0.90969115

00:30:13.415 --> 00:30:15.995 advocated for totally weaning inotropes

NOTE Confidence: 0.90969115

00:30:16.135 --> 00:30:17.575 and pressers and that may

NOTE Confidence: 0.90969115

00:30:17.575 --> 00:30:18.395 seem counterintuitive

NOTE Confidence: 0.9428416

00:30:18.934 --> 00:30:19.815 but we'll go into a

NOTE Confidence: 0.9428416

00:30:19.815 --> 00:30:21.095 little bit now of why

NOTE Confidence: 0.9428416

00:30:21.095 --> 00:30:22.054 that is. So let's look

NOTE Confidence: 0.9428416

00:30:22.054 --> 00:30:24.235 at is there any foundation

NOTE Confidence: 0.9428416

00:30:24.375 --> 00:30:25.575 for this? We don't have

NOTE Confidence: 0.9428416

00:30:25.575 --> 00:30:26.075 randomized

NOTE Confidence: 0.99818146

00:30:26.375 --> 00:30:26.875 data

NOTE Confidence: 0.9940939

00:30:27.175 --> 00:30:28.235 when this was started

NOTE Confidence: 0.96321833

00:30:28.590 --> 00:30:29.870 or any of this, but

NOTE Confidence: 0.96321833

00:30:29.870 --> 00:30:31.730 there were some theoretical foundations.

NOTE Confidence: 0.96321833

00:30:31.870 --> 00:30:33.390 First of all, with regard

NOTE Confidence: 0.96321833

00:30:33.390 --> 00:30:34.270 to the use of right

NOTE Confidence: 0.96321833

00:30:34.270 --> 00:30:35.010 heart cath,

NOTE Confidence: 0.9216546

00:30:35.630 --> 00:30:37.010 you know, in the late

NOTE Confidence: 0.9216546

00:30:37.309 --> 00:30:38.049 two thousands,

NOTE Confidence: 0.95272624

00:30:38.909 --> 00:30:39.950 there was a bunch of

NOTE Confidence: 0.95272624

00:30:39.950 --> 00:30:41.070 data that said you should

NOTE Confidence: 0.95272624

00:30:41.070 --> 00:30:42.270 not use right heart caths

NOTE Confidence: 0.95272624

00:30:42.270 --> 00:30:43.470 in the intensive care unit

NOTE Confidence: 0.95272624

00:30:43.470 --> 00:30:45.015 and that killed the right

NOTE Confidence: 0.95272624

00:30:45.015 --> 00:30:45.895 heart cath for,

NOTE Confidence: 0.9610878

00:30:46.535 --> 00:30:47.275 for several,

NOTE Confidence: 0.886282

00:30:48.375 --> 00:30:49.515 for for a decade.

NOTE Confidence: 0.99510956

00:30:50.455 --> 00:30:51.815 But as we started treating

NOTE Confidence: 0.99510956

00:30:51.815 --> 00:30:52.775 more and more patients with

NOTE Confidence: 0.99510956

00:30:52.775 --> 00:30:53.995 cardiogenic shock

NOTE Confidence: 0.96496457

00:30:54.375 --> 00:30:56.615 and kinda really appreciating that

NOTE Confidence: 0.96496457

00:30:56.615 --> 00:30:57.415 we didn't know what we

NOTE Confidence: 0.96496457

00:30:57.415 --> 00:30:58.375 were doing when we didn't

NOTE Confidence: 0.96496457

00:30:58.375 --> 00:30:59.595 have a right heart cath,

NOTE Confidence: 0.95374715

00:31:00.220 --> 00:31:01.100 you know, there was there

NOTE Confidence: 0.95374715

00:31:01.100 --> 00:31:02.539 was more in there was

NOTE Confidence: 0.95374715

00:31:02.539 --> 00:31:03.899 renewed interest in this and

NOTE Confidence: 0.95374715

00:31:03.899 --> 00:31:05.440 we started using it again.

NOTE Confidence: 0.9296225

00:31:05.899 --> 00:31:06.860 And this is from the

NOTE Confidence: 0.9296225

00:31:06.860 --> 00:31:08.779 cardiogenic shock working group and

NOTE Confidence: 0.9296225

00:31:08.779 --> 00:31:09.519 we characterized

NOTE Confidence: 0.93604165

00:31:09.899 --> 00:31:12.080 patients who were treated without

NOTE Confidence: 0.93604165

00:31:12.220 --> 00:31:13.039 any hemodynamic

NOTE Confidence: 0.8735608

00:31:13.475 --> 00:31:14.295 invasive monitoring,

NOTE Confidence: 0.9669781

00:31:14.835 --> 00:31:16.675 were treated with partial information,

NOTE Confidence: 0.9669781

00:31:16.675 --> 00:31:18.035 and were treated with complete

NOTE Confidence: 0.9669781

00:31:18.035 --> 00:31:18.535 information.

NOTE Confidence: 0.94792724

00:31:19.155 --> 00:31:20.115 And what you can see

NOTE Confidence: 0.94792724

00:31:20.115 --> 00:31:21.555 here, the the focus here

NOTE Confidence: 0.94792724

00:31:21.555 --> 00:31:22.595 is this is the bottom

NOTE Confidence: 0.94792724

00:31:22.595 --> 00:31:23.635 line here is in this

NOTE Confidence: 0.94792724

00:31:23.635 --> 00:31:24.855 bottom right corner,

NOTE Confidence: 0.927988

00:31:25.250 --> 00:31:27.090 which is in patients who

NOTE Confidence: 0.927988

00:31:27.090 --> 00:31:28.850 present with a more severe

NOTE Confidence: 0.927988

00:31:28.850 --> 00:31:31.350 shocks stage d and e,

NOTE Confidence: 0.9073923

00:31:31.970 --> 00:31:33.410 and even to a certain

NOTE Confidence: 0.9073923

00:31:33.410 --> 00:31:33.910 extent

NOTE Confidence: 0.7690822

00:31:34.450 --> 00:31:35.350 stage c,

NOTE Confidence: 0.99559987

00:31:36.370 --> 00:31:37.890 the more information you have

NOTE Confidence: 0.99559987

00:31:37.890 --> 00:31:38.630 about hemodynamics

NOTE Confidence: 0.8450671

00:31:38.930 --> 00:31:39.990 the lower the mortality.

NOTE Confidence: 0.971678

00:31:40.395 --> 00:31:41.675 This is registry data. This

NOTE Confidence: 0.971678

00:31:41.675 --> 00:31:43.215 is not randomized data again,

NOTE Confidence: 0.971678

00:31:43.355 --> 00:31:44.235 but this is the kind

NOTE Confidence: 0.971678

00:31:44.235 --> 00:31:45.275 of level of evidence that

NOTE Confidence: 0.971678

00:31:45.275 --> 00:31:45.935 we have.

NOTE Confidence: 0.9245801

00:31:46.315 --> 00:31:46.955 What about,

NOTE Confidence: 0.9809322

00:31:47.435 --> 00:31:49.595 the MCS? So when we

NOTE Confidence: 0.9809322

00:31:49.595 --> 00:31:51.835 started when NCSI started, we

NOTE Confidence: 0.9809322

00:31:51.835 --> 00:31:52.715 didn't have a lot of

NOTE Confidence: 0.9809322

00:31:52.715 --> 00:31:54.155 information about Impella, but we

NOTE Confidence: 0.9809322

00:31:54.155 --> 00:31:55.115 knew a lot about the

NOTE Confidence: 0.9809322

00:31:55.115 --> 00:31:56.470 physiology of this. And this

NOTE Confidence: 0.9809322

00:31:56.470 --> 00:31:58.230 is really what, and it's

NOTE Confidence: 0.9809322

00:31:58.230 --> 00:31:59.510 important I think to understand

NOTE Confidence: 0.9809322

00:31:59.510 --> 00:32:01.130 the physiology of these devices.

NOTE Confidence: 0.96020806

00:32:01.990 --> 00:32:03.289 This is what an Impella

NOTE Confidence: 0.96020806

00:32:03.350 --> 00:32:05.110 basically does. This is the

NOTE Confidence: 0.96020806

00:32:05.269 --> 00:32:06.570 the green is the shock

NOTE Confidence: 0.9653402

00:32:06.870 --> 00:32:08.630 pressure volume loop. When you

NOTE Confidence: 0.9653402

00:32:08.630 --> 00:32:09.130 initiate

NOTE Confidence: 0.9246923

00:32:09.664 --> 00:32:10.725 support with an impeller,

NOTE Confidence: 0.97528005

00:32:11.184 --> 00:32:12.945 first you unload the ventricle,

NOTE Confidence: 0.97528005

00:32:12.945 --> 00:32:14.065 the wedge pressure goes down,

NOTE Confidence: 0.97528005

00:32:14.065 --> 00:32:15.505 the end diastolic pressure goes

NOTE Confidence: 0.97528005

00:32:15.505 --> 00:32:17.345 down. The loop changes from

NOTE Confidence: 0.97528005

00:32:17.345 --> 00:32:18.885 a rectangle to more triangular

NOTE Confidence: 0.9690824

00:32:19.424 --> 00:32:21.184 because these devices are always

NOTE Confidence: 0.9690824

00:32:21.184 --> 00:32:22.544 pulling volume out of the

NOTE Confidence: 0.9690824

00:32:22.544 --> 00:32:23.044 ventricle.

NOTE Confidence: 0.9256609

00:32:23.539 --> 00:32:24.980 So the trajectory the volume

NOTE Confidence: 0.9256609

00:32:24.980 --> 00:32:26.020 trajectory is always in a

NOTE Confidence: 0.9256609

00:32:26.020 --> 00:32:26.919 negative direction.

NOTE Confidence: 0.9687085

00:32:27.779 --> 00:32:29.779 They reduce that that area

NOTE Confidence: 0.9687085

00:32:29.779 --> 00:32:31.220 of this this pressure volume

NOTE Confidence: 0.9687085

00:32:31.220 --> 00:32:32.820 area which is the oxygen

NOTE Confidence: 0.9687085

00:32:32.820 --> 00:32:33.320 consumption.

NOTE Confidence: 0.99505466

00:32:33.779 --> 00:32:35.960 So these devices reduce oxygen

NOTE Confidence: 0.99505466

00:32:36.020 --> 00:32:36.520 consumption

NOTE Confidence: 0.9618816

00:32:37.215 --> 00:32:38.895 and of course importantly they

NOTE Confidence: 0.9618816

00:32:38.895 --> 00:32:40.095 have the potential to take

NOTE Confidence: 0.9618816

00:32:40.095 --> 00:32:40.895 over for the work of

NOTE Confidence: 0.9618816

00:32:40.895 --> 00:32:42.195 the heart. Here you see

NOTE Confidence: 0.9618816

00:32:42.335 --> 00:32:43.695 this phenomenon that we call,

NOTE Confidence: 0.9618816

00:32:44.095 --> 00:32:46.434 aortic ventricular pressure uncoupling.

NOTE Confidence: 0.92305005

00:32:46.815 --> 00:32:48.174 So the aortic valve is

NOTE Confidence: 0.92305005

00:32:48.174 --> 00:32:49.730 closed the venture the ventricular

NOTE Confidence: 0.92305005

00:32:49.790 --> 00:32:51.550 pressure goes down, aortic pressure

NOTE Confidence: 0.92305005

00:32:51.550 --> 00:32:52.750 goes up, aortic valve is

NOTE Confidence: 0.92305005

00:32:52.750 --> 00:32:53.250 closed

NOTE Confidence: 0.9597158

00:32:53.550 --> 00:32:54.830 and the the impeller is

NOTE Confidence: 0.9597158

00:32:54.830 --> 00:32:56.030 doing the work. Now the

NOTE Confidence: 0.9597158

00:32:56.030 --> 00:32:57.309 degree of uncoupling that you

NOTE Confidence: 0.9597158

00:32:57.309 --> 00:32:59.390 get depends on the on

NOTE Confidence: 0.9597158

00:32:59.390 --> 00:33:01.090 the, flow of the device

NOTE Confidence: 0.9253754

00:33:01.534 --> 00:33:03.075 and the degree of of

NOTE Confidence: 0.9253754

00:33:03.135 --> 00:33:03.715 a ventricular

NOTE Confidence: 0.9793274

00:33:04.015 --> 00:33:05.375 compromise. So you don't always

NOTE Confidence: 0.9793274

00:33:05.375 --> 00:33:06.034 get this.

NOTE Confidence: 0.98545545

00:33:06.654 --> 00:33:07.615 Those of you who treat

NOTE Confidence: 0.98545545

00:33:07.615 --> 00:33:08.894 LVAD patients see this all

NOTE Confidence: 0.98545545

00:33:08.894 --> 00:33:10.495 the time. This is the

NOTE Confidence: 0.98545545

00:33:10.495 --> 00:33:11.635 identical physiology.

NOTE Confidence: 0.9395162

00:33:12.575 --> 00:33:13.855 You you see patients without

NOTE Confidence: 0.9395162

00:33:13.855 --> 00:33:14.815 a pulse. This is the

NOTE Confidence: 0.9395162

00:33:14.815 --> 00:33:16.255 same. This is exactly what's

NOTE Confidence: 0.9395162

00:33:16.255 --> 00:33:18.570 happening, with the durable durable

NOTE Confidence: 0.9395162

00:33:18.630 --> 00:33:19.130 LVAD.

NOTE Confidence: 0.99751866

00:33:20.070 --> 00:33:21.370 So that's what we knew

NOTE Confidence: 0.99751866

00:33:21.510 --> 00:33:22.330 at the time

NOTE Confidence: 0.98418164

00:33:22.710 --> 00:33:24.310 when NCSI was getting started

NOTE Confidence: 0.98418164

00:33:24.310 --> 00:33:25.190 and it made it made

NOTE Confidence: 0.98418164

00:33:25.190 --> 00:33:25.690 sense.

NOTE Confidence: 0.9662158

00:33:25.990 --> 00:33:27.590 Now here's what happens with

NOTE Confidence: 0.9662158

00:33:27.590 --> 00:33:28.710 when you use when you

NOTE Confidence: 0.9662158

00:33:28.710 --> 00:33:30.410 use inotropes and pressors.

NOTE Confidence: 0.98620045

00:33:30.710 --> 00:33:31.830 On the left side you

NOTE Confidence: 0.98620045

00:33:31.830 --> 00:33:33.210 see the pressure volume

NOTE Confidence: 0.8310186

00:33:34.045 --> 00:33:35.885 loops and the per as

NOTE Confidence: 0.8310186

00:33:35.885 --> 00:33:37.325 you give an inotrope and

NOTE Confidence: 0.8310186

00:33:37.325 --> 00:33:39.005 a pressor, you're obviously increasing

NOTE Confidence: 0.8310186

00:33:39.005 --> 00:33:40.145 pressure, you're increasing

NOTE Confidence: 0.9221094

00:33:40.445 --> 00:33:41.405 the work that the heart's

NOTE Confidence: 0.9221094

00:33:41.405 --> 00:33:43.165 doing, you're increasing the cardiac

NOTE Confidence: 0.9221094

00:33:43.165 --> 00:33:44.445 output. But you see on

NOTE Confidence: 0.9221094

00:33:44.445 --> 00:33:45.665 the right side the metabolic

NOTE Confidence: 0.9221094

00:33:45.725 --> 00:33:46.225 consequence.

NOTE Confidence: 0.9530359

00:33:46.980 --> 00:33:48.179 And this is that pressure

NOTE Confidence: 0.9530359

00:33:48.179 --> 00:33:49.380 volume area and this is

NOTE Confidence: 0.9530359

00:33:49.380 --> 00:33:50.440 the oxygen consumption.

NOTE Confidence: 0.9673223

00:33:50.820 --> 00:33:51.780 And you can see with

NOTE Confidence: 0.9673223

00:33:51.780 --> 00:33:54.440 relatively modest increases in contractility

NOTE Confidence: 0.9673223

00:33:54.660 --> 00:33:56.679 and cardiac output, you're markedly

NOTE Confidence: 0.97536767

00:33:57.140 --> 00:33:59.715 increasing the myocardial oxygen consumption.

NOTE Confidence: 0.98287934

00:34:00.034 --> 00:34:01.075 And that was what we

NOTE Confidence: 0.98287934

00:34:01.075 --> 00:34:02.534 really think is the negative,

NOTE Confidence: 0.9665704

00:34:03.154 --> 00:34:05.975 aspects of of, of inotropes.

NOTE Confidence: 0.9803086

00:34:06.755 --> 00:34:08.275 So this is a,

NOTE Confidence: 0.9932223

00:34:08.594 --> 00:34:10.055 a plot of the cardiac

NOTE Confidence: 0.9932223

00:34:10.114 --> 00:34:11.015 power output.

NOTE Confidence: 0.9668286

00:34:11.635 --> 00:34:12.810 This is from the original

NOTE Confidence: 0.9668286

00:34:12.810 --> 00:34:14.270 shock trial. This is CPO

NOTE Confidence: 0.9668286

00:34:14.330 --> 00:34:15.530 and maybe you're using this

NOTE Confidence: 0.9668286

00:34:15.530 --> 00:34:16.810 in your clinical practice in

NOTE Confidence: 0.9668286

00:34:16.810 --> 00:34:17.469 your treatment.

NOTE Confidence: 0.9541895

00:34:18.010 --> 00:34:19.290 CPO and this is in

NOTE Confidence: 0.9541895

00:34:19.290 --> 00:34:20.270 hospital mortality.

NOTE Confidence: 0.9945254

00:34:20.810 --> 00:34:22.489 Normal cardiac power output is

NOTE Confidence: 0.9945254

00:34:22.489 --> 00:34:23.550 about one watt

NOTE Confidence: 0.93756914

00:34:23.930 --> 00:34:25.610 and as the watts wattage

NOTE Confidence: 0.93756914

00:34:25.610 --> 00:34:27.130 goes below about point seven,

NOTE Confidence: 0.93756914

00:34:27.130 --> 00:34:27.790 the mortality

NOTE Confidence: 0.9942169

00:34:28.175 --> 00:34:29.795 starts really increasing dramatically.

NOTE Confidence: 0.9358252

00:34:30.335 --> 00:34:31.855 So in the NCSI what

NOTE Confidence: 0.9358252

00:34:31.855 --> 00:34:33.555 they did was they created

NOTE Confidence: 0.9358252

00:34:33.614 --> 00:34:35.775 this plot but divided the

NOTE Confidence: 0.9358252

00:34:35.775 --> 00:34:37.875 patients between whether they needed

NOTE Confidence: 0.9798837

00:34:38.494 --> 00:34:40.655 zero inotropes or one or

NOTE Confidence: 0.9798837

00:34:40.655 --> 00:34:42.210 two or more. And what

NOTE Confidence: 0.9798837

00:34:42.210 --> 00:34:43.430 you can see is

NOTE Confidence: 0.94141597

00:34:43.890 --> 00:34:46.130 the less inotropes support that

NOTE Confidence: 0.94141597

00:34:46.130 --> 00:34:47.489 the patient needs the the

NOTE Confidence: 0.94141597

00:34:47.489 --> 00:34:49.170 better the mortality. Now, they

NOTE Confidence: 0.94141597

00:34:49.170 --> 00:34:50.390 try to make the argument

NOTE Confidence: 0.94141597

00:34:50.450 --> 00:34:52.150 that this means that inotropes

NOTE Confidence: 0.94141597

00:34:52.210 --> 00:34:53.570 are bad which obviously this

NOTE Confidence: 0.94141597

00:34:53.570 --> 00:34:55.090 does not. This just means

NOTE Confidence: 0.94141597

00:34:55.090 --> 00:34:56.469 that patients who are sicker

NOTE Confidence: 0.9552855

00:34:56.795 --> 00:34:57.935 need more inotropes.

NOTE Confidence: 0.9924082

00:34:58.395 --> 00:34:59.135 But nevertheless,

NOTE Confidence: 0.99923044

00:35:00.315 --> 00:35:02.155 this does serve as an

NOTE Confidence: 0.99923044

00:35:02.155 --> 00:35:03.135 interesting prognostic

NOTE Confidence: 0.9945053

00:35:03.675 --> 00:35:04.175 bedside

NOTE Confidence: 0.9629212

00:35:04.555 --> 00:35:05.755 tool that you can use

NOTE Confidence: 0.9629212

00:35:05.755 --> 00:35:07.515 because they just created this

NOTE Confidence: 0.9629212

00:35:07.515 --> 00:35:08.555 matrix where you have the

NOTE Confidence: 0.9629212

00:35:08.555 --> 00:35:10.395 number of inotropes patients on

NOTE Confidence: 0.9629212

00:35:10.395 --> 00:35:11.940 the cardiac power output

NOTE Confidence: 0.8983918

00:35:12.239 --> 00:35:13.200 and you can see this

NOTE Confidence: 0.8983918

00:35:13.200 --> 00:35:14.800 is while on support, you

NOTE Confidence: 0.8983918

00:35:14.800 --> 00:35:15.860 can see the patients,

NOTE Confidence: 0.9914447

00:35:16.239 --> 00:35:17.700 odds of of survival.

NOTE Confidence: 0.9563722

00:35:18.239 --> 00:35:19.700 So even though it doesn't

NOTE Confidence: 0.9563722

00:35:19.840 --> 00:35:20.880 say that drugs are bad,

NOTE Confidence: 0.9563722

00:35:20.880 --> 00:35:22.080 we do think we think

NOTE Confidence: 0.9563722

00:35:22.080 --> 00:35:23.760 that drugs are bad. And

NOTE Confidence: 0.9563722

00:35:23.760 --> 00:35:25.460 in fact, there are three,

NOTE Confidence: 0.96530354

00:35:26.225 --> 00:35:27.585 there are three trials of

NOTE Confidence: 0.96530354

00:35:27.585 --> 00:35:29.105 those that I mentioned that

NOTE Confidence: 0.96530354

00:35:29.105 --> 00:35:30.565 are looking at at drugs.

NOTE Confidence: 0.8906691

00:35:31.265 --> 00:35:32.145 And in fact the one

NOTE Confidence: 0.8906691

00:35:32.145 --> 00:35:33.745 that's most relevant is the

NOTE Confidence: 0.8906691

00:35:33.745 --> 00:35:34.945 follow-up of the DO RE

NOTE Confidence: 0.8906691

00:35:34.945 --> 00:35:36.305 MI trials called the capital

NOTE Confidence: 0.8906691

00:35:36.305 --> 00:35:37.685 DO RE MI two trial,

NOTE Confidence: 0.8906691

00:35:37.825 --> 00:35:39.605 which is looking at dobutamine

NOTE Confidence: 0.9118695

00:35:39.905 --> 00:35:41.605 or milrinone versus placebo.

NOTE Confidence: 0.9873888

00:35:42.030 --> 00:35:43.250 A very brave trial.

NOTE Confidence: 0.93741906

00:35:43.950 --> 00:35:44.989 It's really we thought that

NOTE Confidence: 0.93741906

00:35:44.989 --> 00:35:45.870 it would be finished by

NOTE Confidence: 0.93741906

00:35:45.870 --> 00:35:46.989 now, but it they have

NOTE Confidence: 0.93741906

00:35:46.989 --> 00:35:49.230 not yet completed enrollment. This

NOTE Confidence: 0.93741906

00:35:49.230 --> 00:35:50.370 is being done in Canada.

NOTE Confidence: 0.9848493

00:35:52.510 --> 00:35:53.730 Now if I can just

NOTE Confidence: 0.90614974

00:35:54.430 --> 00:35:55.090 put the

NOTE Confidence: 0.8084013

00:35:55.550 --> 00:35:56.210 the NCSI

NOTE Confidence: 0.9965797

00:35:56.670 --> 00:35:57.170 algorithm

NOTE Confidence: 0.97616225

00:35:57.525 --> 00:35:59.364 into physiological terms, what you're

NOTE Confidence: 0.97616225

00:35:59.364 --> 00:36:00.805 gonna see on the next

NOTE Confidence: 0.97616225

00:36:00.805 --> 00:36:02.085 slide are the pressure volume

NOTE Confidence: 0.97616225

00:36:02.085 --> 00:36:02.585 loops

NOTE Confidence: 0.95340616

00:36:03.125 --> 00:36:04.565 and on the left and

NOTE Confidence: 0.95340616

00:36:04.565 --> 00:36:06.505 the and the oxygen consumption

NOTE Confidence: 0.95340616

00:36:06.565 --> 00:36:08.005 stuff on the right of

NOTE Confidence: 0.95340616

00:36:08.005 --> 00:36:10.585 putting that protocol into action.

NOTE Confidence: 0.9199438

00:36:10.964 --> 00:36:12.404 And you'll see really what

NOTE Confidence: 0.9199438

00:36:12.404 --> 00:36:14.030 I think what the, the,

NOTE Confidence: 0.9924488

00:36:14.590 --> 00:36:15.570 the physiological

NOTE Confidence: 0.99145085

00:36:15.950 --> 00:36:17.170 advantage of that protocol.

NOTE Confidence: 0.9896374

00:36:18.270 --> 00:36:19.550 So we're gonna start with

NOTE Confidence: 0.9896374

00:36:19.550 --> 00:36:21.410 a patient who's in shock

NOTE Confidence: 0.9896374

00:36:21.630 --> 00:36:22.450 on inotropes.

NOTE Confidence: 0.9446868

00:36:23.070 --> 00:36:24.430 So here we this patient

NOTE Confidence: 0.9446868

00:36:24.430 --> 00:36:26.109 now is on inotropes. This

NOTE Confidence: 0.9446868

00:36:26.109 --> 00:36:28.270 is obviously simulations, but the

NOTE Confidence: 0.9446868

00:36:28.270 --> 00:36:28.770 idea.

NOTE Confidence: 0.97400016

00:36:29.085 --> 00:36:30.045 And now the first thing

NOTE Confidence: 0.97400016

00:36:30.045 --> 00:36:30.925 that we're gonna do is

NOTE Confidence: 0.97400016

00:36:30.925 --> 00:36:32.445 put the Impella in and

NOTE Confidence: 0.97400016

00:36:32.445 --> 00:36:33.805 what the Impella does is

NOTE Confidence: 0.97400016

00:36:33.805 --> 00:36:35.805 unload the heart and reduce

NOTE Confidence: 0.97400016

00:36:35.805 --> 00:36:37.025 the oxygen consumption

NOTE Confidence: 0.94056016

00:36:37.805 --> 00:36:39.405 by a certain amount because

NOTE Confidence: 0.94056016

00:36:39.405 --> 00:36:40.765 of the unloading that it

NOTE Confidence: 0.94056016

00:36:40.765 --> 00:36:41.265 provides.

NOTE Confidence: 0.9585532

00:36:41.730 --> 00:36:42.930 And now the next thing

NOTE Confidence: 0.9585532

00:36:42.930 --> 00:36:44.550 that we're gonna do here

NOTE Confidence: 0.9585532

00:36:44.770 --> 00:36:46.290 is now we're gonna do

NOTE Confidence: 0.9585532

00:36:46.290 --> 00:36:47.250 the other part of the

NOTE Confidence: 0.9585532

00:36:47.250 --> 00:36:48.630 protocol which is to withdraw

NOTE Confidence: 0.9585532

00:36:48.770 --> 00:36:50.150 the inotropes and pressors.

NOTE Confidence: 0.9863927

00:36:50.609 --> 00:36:52.050 And what you're gonna see

NOTE Confidence: 0.9863927

00:36:52.050 --> 00:36:54.070 here is that the main

NOTE Confidence: 0.84490603

00:36:54.855 --> 00:36:55.755 in terms of

NOTE Confidence: 0.9682231

00:36:56.135 --> 00:36:57.975 metabolic benefit, the main benefit

NOTE Confidence: 0.9682231

00:36:57.975 --> 00:36:58.795 of this protocol

NOTE Confidence: 0.9410295

00:36:59.175 --> 00:37:00.535 is the withdrawal of the

NOTE Confidence: 0.9410295

00:37:00.535 --> 00:37:02.395 inotropes and pressors. It's not

NOTE Confidence: 0.9410295

00:37:02.455 --> 00:37:04.535 necessarily the Impella itself which

NOTE Confidence: 0.9410295

00:37:04.535 --> 00:37:06.295 does provide some unloading and

NOTE Confidence: 0.9410295

00:37:06.295 --> 00:37:07.435 some oxygen saving,

NOTE Confidence: 0.99891764

00:37:07.735 --> 00:37:08.635 but it's really

NOTE Confidence: 0.9827076

00:37:08.980 --> 00:37:10.420 the the ability to withdraw

NOTE Confidence: 0.9827076

00:37:10.420 --> 00:37:11.540 the drugs which you could

NOTE Confidence: 0.9827076

00:37:11.540 --> 00:37:12.900 not have done if you

NOTE Confidence: 0.9827076

00:37:12.900 --> 00:37:14.120 did not have the Impella.

NOTE Confidence: 0.9745748

00:37:14.500 --> 00:37:15.460 So you can think of

NOTE Confidence: 0.9745748

00:37:15.460 --> 00:37:17.060 the Impella not only as

NOTE Confidence: 0.9745748

00:37:17.060 --> 00:37:19.380 providing a direct benefit in

NOTE Confidence: 0.9745748

00:37:19.380 --> 00:37:20.820 terms of unloading, but also

NOTE Confidence: 0.9745748

00:37:20.820 --> 00:37:22.120 the secondary benefit

NOTE Confidence: 0.92804503

00:37:22.655 --> 00:37:24.335 by allowing by taking over

NOTE Confidence: 0.92804503

00:37:24.335 --> 00:37:24.974 for the work of the

NOTE Confidence: 0.92804503

00:37:24.974 --> 00:37:25.474 heart

NOTE Confidence: 0.8067886

00:37:25.775 --> 00:37:27.135 allowing you to,

NOTE Confidence: 0.93223387

00:37:27.695 --> 00:37:28.974 allowing you to, to do

NOTE Confidence: 0.93223387

00:37:28.974 --> 00:37:29.714 this withdrawal.

NOTE Confidence: 0.95872134

00:37:31.535 --> 00:37:32.915 Which may be the the

NOTE Confidence: 0.95872134

00:37:33.135 --> 00:37:34.415 major part of the, of

NOTE Confidence: 0.95872134

00:37:34.415 --> 00:37:35.075 the benefits.

NOTE Confidence: 0.9653849

00:37:35.739 --> 00:37:36.960 So this is the NCSI.

NOTE Confidence: 0.9653849

00:37:37.260 --> 00:37:38.400 They, ultimately,

NOTE Confidence: 0.958175

00:37:39.260 --> 00:37:41.340 enrolled, about four hundred patients

NOTE Confidence: 0.958175

00:37:41.340 --> 00:37:42.780 in their in their formal

NOTE Confidence: 0.958175

00:37:42.780 --> 00:37:43.760 part of their study.

NOTE Confidence: 0.972489

00:37:44.140 --> 00:37:45.660 And really the the thing

NOTE Confidence: 0.972489

00:37:45.660 --> 00:37:46.780 that they're very proud of

NOTE Confidence: 0.972489

00:37:46.780 --> 00:37:47.980 is that the survival to

NOTE Confidence: 0.972489

00:37:47.980 --> 00:37:49.694 discharge is seventy percent

NOTE Confidence: 0.9575071

00:37:49.994 --> 00:37:51.755 which compared historically to about

NOTE Confidence: 0.9575071

00:37:51.755 --> 00:37:53.594 fifty percent. But we don't

NOTE Confidence: 0.9575071

00:37:53.594 --> 00:37:54.555 know what the control group

NOTE Confidence: 0.9575071

00:37:54.555 --> 00:37:55.674 is because this is also

NOTE Confidence: 0.9575071

00:37:55.674 --> 00:37:57.194 a selected, you know, this

NOTE Confidence: 0.9575071

00:37:57.194 --> 00:37:58.415 is a selected population,

NOTE Confidence: 0.99925756

00:37:59.114 --> 00:38:00.094 to begin with.

NOTE Confidence: 0.9148934

00:38:01.040 --> 00:38:01.859 But nevertheless,

NOTE Confidence: 0.9702492

00:38:02.239 --> 00:38:02.739 this,

NOTE Confidence: 0.94910336

00:38:03.200 --> 00:38:03.940 this algorithm,

NOTE Confidence: 0.99987555

00:38:04.239 --> 00:38:05.060 this effort

NOTE Confidence: 0.80074334

00:38:05.440 --> 00:38:05.940 really,

NOTE Confidence: 0.98585653

00:38:06.400 --> 00:38:07.940 spawned a lot of activity

NOTE Confidence: 0.9324976

00:38:08.480 --> 00:38:10.719 and many other, algorithms have

NOTE Confidence: 0.9324976

00:38:10.719 --> 00:38:12.099 appeared. This is the iNova,

NOTE Confidence: 0.73423386

00:38:13.395 --> 00:38:13.715 shock,

NOTE Confidence: 0.85411686

00:38:14.355 --> 00:38:14.855 initiative.

NOTE Confidence: 0.95449173

00:38:15.235 --> 00:38:16.675 Their their algorithm it's a

NOTE Confidence: 0.95449173

00:38:16.675 --> 00:38:17.655 little bit more granular

NOTE Confidence: 0.95945656

00:38:18.355 --> 00:38:20.375 than the, than the NCSI.

NOTE Confidence: 0.9946916

00:38:20.915 --> 00:38:22.355 This is their algorithm for

NOTE Confidence: 0.9946916

00:38:22.355 --> 00:38:22.855 AMI.

NOTE Confidence: 0.9342093

00:38:23.155 --> 00:38:25.415 They also developed a algorithm

NOTE Confidence: 0.9342093

00:38:25.475 --> 00:38:26.675 for treating heart failure shock

NOTE Confidence: 0.9342093

00:38:26.675 --> 00:38:27.810 and you'll see there are

NOTE Confidence: 0.9342093

00:38:27.890 --> 00:38:28.610 there are a little bit

NOTE Confidence: 0.9342093

00:38:28.610 --> 00:38:29.430 of differences.

NOTE Confidence: 0.98271096

00:38:31.010 --> 00:38:32.130 Both of them both of

NOTE Confidence: 0.98271096

00:38:32.130 --> 00:38:33.590 these algorithms do,

NOTE Confidence: 0.9406801

00:38:34.290 --> 00:38:36.530 really focus on, or really

NOTE Confidence: 0.9406801

00:38:36.530 --> 00:38:38.450 emphasize the need to focus

NOTE Confidence: 0.9406801

00:38:38.450 --> 00:38:40.210 on LV dominant, RV dominant,

NOTE Confidence: 0.9406801

00:38:40.210 --> 00:38:41.989 or BYV and really advocate

NOTE Confidence: 0.9406801

00:38:42.050 --> 00:38:43.594 for the use of of,

NOTE Confidence: 0.9406801

00:38:43.914 --> 00:38:45.434 of right sided support in,

NOTE Confidence: 0.9406801

00:38:45.755 --> 00:38:46.414 in cases.

NOTE Confidence: 0.9506559

00:38:46.714 --> 00:38:47.674 And as you saw what

NOTE Confidence: 0.9506559

00:38:47.674 --> 00:38:48.635 I showed you from shock

NOTE Confidence: 0.9506559

00:38:48.635 --> 00:38:49.835 working group when the CVP

NOTE Confidence: 0.9506559

00:38:49.835 --> 00:38:50.575 is elevated,

NOTE Confidence: 0.9814451

00:38:51.035 --> 00:38:52.315 that obviously has a big

NOTE Confidence: 0.9814451

00:38:52.315 --> 00:38:53.454 impact on mortality.

NOTE Confidence: 0.9757971

00:38:53.914 --> 00:38:54.875 And if if you think

NOTE Confidence: 0.9757971

00:38:54.875 --> 00:38:56.900 about practice, we're least aggressive

NOTE Confidence: 0.9757971

00:38:56.900 --> 00:38:58.599 about all the hemodynamic parameters.

NOTE Confidence: 0.93868285

00:38:58.900 --> 00:39:00.359 I think we're least aggressive

NOTE Confidence: 0.93868285

00:39:00.420 --> 00:39:02.180 about reducing the CVP. You

NOTE Confidence: 0.93868285

00:39:02.180 --> 00:39:03.059 know, we we had, you

NOTE Confidence: 0.93868285

00:39:03.059 --> 00:39:04.119 know, we use diuretics,

NOTE Confidence: 0.98658025

00:39:04.739 --> 00:39:05.940 but, you know, pulling the

NOTE Confidence: 0.98658025

00:39:05.940 --> 00:39:07.480 trigger on a right heart

NOTE Confidence: 0.98658025

00:39:07.755 --> 00:39:09.694 support device or on CVVH

NOTE Confidence: 0.9932314

00:39:10.075 --> 00:39:10.894 or dialysis

NOTE Confidence: 0.9774099

00:39:11.515 --> 00:39:12.875 takes a lot more. But

NOTE Confidence: 0.9774099

00:39:12.875 --> 00:39:13.914 that may be some low

NOTE Confidence: 0.9774099

00:39:13.914 --> 00:39:14.734 hanging fruit,

NOTE Confidence: 0.9634348

00:39:15.114 --> 00:39:16.394 in terms of, some of

NOTE Confidence: 0.9634348

00:39:16.394 --> 00:39:17.454 these, aspects.

NOTE Confidence: 0.96258175

00:39:18.635 --> 00:39:19.454 The NCSI

NOTE Confidence: 0.9328594

00:39:19.994 --> 00:39:21.035 protocol being,

NOTE Confidence: 0.9668231

00:39:21.434 --> 00:39:22.654 national also

NOTE Confidence: 0.9031705

00:39:24.940 --> 00:39:26.460 also fostered this kind of

NOTE Confidence: 0.9031705

00:39:26.460 --> 00:39:28.140 concept of how do networks

NOTE Confidence: 0.9031705

00:39:28.220 --> 00:39:29.739 of how the hospitals networks

NOTE Confidence: 0.9031705

00:39:29.739 --> 00:39:30.480 work together

NOTE Confidence: 0.9366437

00:39:31.020 --> 00:39:32.860 to triage patients and how

NOTE Confidence: 0.9366437

00:39:32.860 --> 00:39:33.840 do you know when

NOTE Confidence: 0.94423485

00:39:34.300 --> 00:39:35.355 if you're if you start

NOTE Confidence: 0.94423485

00:39:35.355 --> 00:39:37.114 out if in the ambulance,

NOTE Confidence: 0.94423485

00:39:37.114 --> 00:39:37.835 how do you know which

NOTE Confidence: 0.94423485

00:39:37.835 --> 00:39:39.195 hospital to go to? And

NOTE Confidence: 0.94423485

00:39:39.195 --> 00:39:40.715 if you're at a, peripheral

NOTE Confidence: 0.94423485

00:39:40.715 --> 00:39:41.594 hospital, how do you know

NOTE Confidence: 0.94423485

00:39:41.594 --> 00:39:42.635 when to transfer? When do

NOTE Confidence: 0.94423485

00:39:42.635 --> 00:39:44.075 you pull that trigger? So

NOTE Confidence: 0.94423485

00:39:44.075 --> 00:39:45.195 all of this was I

NOTE Confidence: 0.94423485

00:39:45.195 --> 00:39:46.655 think really, started,

NOTE Confidence: 0.94888043

00:39:47.435 --> 00:39:47.935 with

NOTE Confidence: 0.78199303

00:39:48.480 --> 00:39:49.920 with Bill O'Neil, Bob Herbis

NOTE Confidence: 0.78199303

00:39:49.920 --> 00:39:50.800 here when they when they

NOTE Confidence: 0.78199303

00:39:50.800 --> 00:39:51.780 started the NCSI

NOTE Confidence: 0.853474

00:39:54.320 --> 00:39:56.000 initiative and it really has

NOTE Confidence: 0.853474

00:39:56.000 --> 00:39:57.600 done I think really a

NOTE Confidence: 0.853474

00:39:57.600 --> 00:39:58.820 great service and

NOTE Confidence: 0.91898495

00:39:59.200 --> 00:40:00.535 I think we're we're you

NOTE Confidence: 0.91898495

00:40:00.535 --> 00:40:01.655 know it's an example of

NOTE Confidence: 0.91898495

00:40:01.655 --> 00:40:03.415 advancing care I think outside

NOTE Confidence: 0.91898495

00:40:03.415 --> 00:40:04.775 of the context of a

NOTE Confidence: 0.91898495

00:40:04.775 --> 00:40:05.835 randomized trial.

NOTE Confidence: 0.9692383

00:40:06.614 --> 00:40:07.495 So let me talk a

NOTE Confidence: 0.9692383

00:40:07.495 --> 00:40:09.035 little bit about balloon pumping,

NOTE Confidence: 0.9231685

00:40:10.135 --> 00:40:11.675 and as we already mentioned,

NOTE Confidence: 0.83968633

00:40:12.215 --> 00:40:13.435 it's a three

NOTE Confidence: 0.9871066

00:40:14.300 --> 00:40:15.760 a class three recommendation

NOTE Confidence: 0.9374476

00:40:16.619 --> 00:40:17.900 again with the key being

NOTE Confidence: 0.9374476

00:40:17.900 --> 00:40:19.260 don't use it in routine,

NOTE Confidence: 0.9374476

00:40:19.260 --> 00:40:20.140 don't use it in everyone.

NOTE Confidence: 0.9374476

00:40:20.140 --> 00:40:21.180 Okay. Well, you shouldn't use

NOTE Confidence: 0.9374476

00:40:21.180 --> 00:40:22.940 anything in everyone. So that's

NOTE Confidence: 0.9374476

00:40:22.940 --> 00:40:23.920 not very helpful.

NOTE Confidence: 0.99534017

00:40:24.780 --> 00:40:26.234 And I'm sure I'm sure

NOTE Confidence: 0.99534017

00:40:26.234 --> 00:40:27.515 you still I'm gonna take

NOTE Confidence: 0.99534017

00:40:27.515 --> 00:40:28.315 a guess that you still

NOTE Confidence: 0.99534017

00:40:28.315 --> 00:40:29.194 use a lot of balloon

NOTE Confidence: 0.99534017

00:40:29.194 --> 00:40:29.694 pumps

NOTE Confidence: 0.9699445

00:40:30.075 --> 00:40:31.355 everywhere everywhere in the United

NOTE Confidence: 0.9699445

00:40:31.355 --> 00:40:32.954 States uses balloon pumps. In

NOTE Confidence: 0.9699445

00:40:32.954 --> 00:40:34.075 Germany, you can't find a

NOTE Confidence: 0.9699445

00:40:34.075 --> 00:40:36.075 balloon pump console. In Denmark,

NOTE Confidence: 0.9699445

00:40:36.075 --> 00:40:36.954 you can barely find a

NOTE Confidence: 0.9699445

00:40:36.954 --> 00:40:38.015 balloon pump console.

NOTE Confidence: 0.9353986

00:40:38.394 --> 00:40:38.714 And,

NOTE Confidence: 0.9255921

00:40:39.515 --> 00:40:40.474 I think that was a

NOTE Confidence: 0.9255921

00:40:40.474 --> 00:40:41.275 I think that was a

NOTE Confidence: 0.9255921

00:40:41.275 --> 00:40:41.730 little bit

NOTE Confidence: 0.95115614

00:40:42.450 --> 00:40:43.590 of a mistake. But nevertheless,

NOTE Confidence: 0.95115614

00:40:43.650 --> 00:40:44.869 this just shows the physiology

NOTE Confidence: 0.95894957

00:40:45.170 --> 00:40:46.850 of a balloon pump.

NOTE Confidence: 0.97146076

00:40:47.410 --> 00:40:49.030 The as a as a

NOTE Confidence: 0.97146076

00:40:49.090 --> 00:40:51.170 device to improve coronary flow,

NOTE Confidence: 0.97146076

00:40:51.170 --> 00:40:52.469 it's a very good device.

NOTE Confidence: 0.97146076

00:40:52.690 --> 00:40:53.989 It augments pressure

NOTE Confidence: 0.89839864

00:40:55.134 --> 00:40:56.494 during diastole when that's when

NOTE Confidence: 0.89839864

00:40:56.494 --> 00:40:57.714 coronary flow occurs.

NOTE Confidence: 0.9522381

00:40:58.094 --> 00:40:59.954 As a mechanical circulatory support

NOTE Confidence: 0.9522381

00:41:00.015 --> 00:41:01.875 system, it's not that powerful.

NOTE Confidence: 0.9522381

00:41:02.094 --> 00:41:03.795 There are generally very small

NOTE Confidence: 0.9522381

00:41:03.934 --> 00:41:05.875 reductions in wedge pressure and

NOTE Confidence: 0.9522381

00:41:06.015 --> 00:41:08.114 small increases in cardiac output.

NOTE Confidence: 0.9663979

00:41:08.730 --> 00:41:09.850 And that was really the

NOTE Confidence: 0.9663979

00:41:09.850 --> 00:41:11.690 basis of this study that

NOTE Confidence: 0.9663979

00:41:11.690 --> 00:41:12.650 was done in Germany, the

NOTE Confidence: 0.9663979

00:41:12.650 --> 00:41:14.570 shock one IVP shock one,

NOTE Confidence: 0.9663979

00:41:14.570 --> 00:41:15.930 which is a hemodynamic study

NOTE Confidence: 0.9663979

00:41:15.930 --> 00:41:18.090 that showed no hemodynamic benefit

NOTE Confidence: 0.9663979

00:41:18.090 --> 00:41:19.530 to all commerce. And then

NOTE Confidence: 0.9663979

00:41:19.530 --> 00:41:20.650 the shock two study which

NOTE Confidence: 0.9663979

00:41:20.650 --> 00:41:22.250 showed no benefit in terms

NOTE Confidence: 0.9663979

00:41:22.250 --> 00:41:23.610 of survival when used in

NOTE Confidence: 0.9663979

00:41:23.610 --> 00:41:24.110 everyone.

NOTE Confidence: 0.9521285

00:41:24.625 --> 00:41:25.125 But,

NOTE Confidence: 0.96757483

00:41:26.545 --> 00:41:28.945 everyone everyone has an experience

NOTE Confidence: 0.96757483

00:41:28.945 --> 00:41:30.385 where balloon pump worked. Right?

NOTE Confidence: 0.96757483

00:41:30.385 --> 00:41:31.825 Is anyone not having that

NOTE Confidence: 0.96757483

00:41:31.825 --> 00:41:32.565 that experience?

NOTE Confidence: 0.96662134

00:41:33.185 --> 00:41:35.185 So when we this was

NOTE Confidence: 0.96662134

00:41:35.185 --> 00:41:35.985 a study that we did

NOTE Confidence: 0.96662134

00:41:35.985 --> 00:41:36.645 at Columbia,

NOTE Confidence: 0.8690326

00:41:37.344 --> 00:41:38.645 led by Rishad Goran.

NOTE Confidence: 0.9635719

00:41:39.410 --> 00:41:41.170 This is AMI shock patients

NOTE Confidence: 0.9635719

00:41:41.170 --> 00:41:42.690 and this waterfall plots just

NOTE Confidence: 0.9635719

00:41:42.690 --> 00:41:44.070 show individual patients

NOTE Confidence: 0.9907334

00:41:44.450 --> 00:41:46.210 and the effect on cardiac

NOTE Confidence: 0.9907334

00:41:46.210 --> 00:41:47.730 output. And what you can

NOTE Confidence: 0.9907334

00:41:47.730 --> 00:41:49.350 see is there are responders

NOTE Confidence: 0.9800762

00:41:49.650 --> 00:41:50.950 and there are non responders.

NOTE Confidence: 0.9715908

00:41:51.489 --> 00:41:52.850 In this case, there it's

NOTE Confidence: 0.9715908

00:41:52.850 --> 00:41:53.670 very symmetrical

NOTE Confidence: 0.9558437

00:41:54.075 --> 00:41:55.594 with the zero crossing. There's

NOTE Confidence: 0.9558437

00:41:55.594 --> 00:41:57.195 a zero effect on cardiac

NOTE Confidence: 0.9558437

00:41:57.195 --> 00:41:57.695 output,

NOTE Confidence: 0.99961966

00:41:58.315 --> 00:41:59.535 being right in the middle

NOTE Confidence: 0.9669139

00:41:59.835 --> 00:42:01.355 and and also the the

NOTE Confidence: 0.9669139

00:42:01.355 --> 00:42:02.954 pattern here being very symmetrical.

NOTE Confidence: 0.9669139

00:42:02.954 --> 00:42:03.915 So if you take all

NOTE Confidence: 0.9669139

00:42:03.915 --> 00:42:05.055 these patients together

NOTE Confidence: 0.9497372

00:42:05.355 --> 00:42:06.789 and average them out, you're

NOTE Confidence: 0.9497372

00:42:06.789 --> 00:42:08.309 gonna get zero, which is

NOTE Confidence: 0.9497372

00:42:08.309 --> 00:42:09.269 almost what you get in

NOTE Confidence: 0.9497372

00:42:09.269 --> 00:42:11.109 almost all trials of balloon

NOTE Confidence: 0.9497372

00:42:11.109 --> 00:42:12.250 pump that looked at hemodynamics.

NOTE Confidence: 0.9369039

00:42:13.109 --> 00:42:14.710 The average all pooled the

NOTE Confidence: 0.9369039

00:42:14.710 --> 00:42:16.230 average increase in cardiac output

NOTE Confidence: 0.9369039

00:42:16.230 --> 00:42:17.349 is about point three to

NOTE Confidence: 0.9369039

00:42:17.349 --> 00:42:18.950 point four liters a minute.

NOTE Confidence: 0.9369039

00:42:18.950 --> 00:42:20.009 And this is basically

NOTE Confidence: 0.9549331

00:42:20.355 --> 00:42:21.635 probably the reason because there

NOTE Confidence: 0.9549331

00:42:21.635 --> 00:42:22.835 are responders and there are

NOTE Confidence: 0.9549331

00:42:22.835 --> 00:42:23.575 non responders.

NOTE Confidence: 0.96637315

00:42:24.355 --> 00:42:25.475 When you look at heart

NOTE Confidence: 0.96637315

00:42:25.475 --> 00:42:27.234 failure shock, the picture is

NOTE Confidence: 0.96637315

00:42:27.234 --> 00:42:27.975 very different.

NOTE Confidence: 0.85241944

00:42:28.835 --> 00:42:29.335 And,

NOTE Confidence: 0.8887215

00:42:30.515 --> 00:42:31.555 you see here there are

NOTE Confidence: 0.8887215

00:42:31.555 --> 00:42:32.594 many in for heart failure

NOTE Confidence: 0.8887215

00:42:32.594 --> 00:42:33.635 shock, there are many many

NOTE Confidence: 0.8887215

00:42:33.635 --> 00:42:34.535 more responders

NOTE Confidence: 0.9849692

00:42:35.075 --> 00:42:36.055 than non responders.

NOTE Confidence: 0.97998476

00:42:36.380 --> 00:42:37.739 Do we know why? No.

NOTE Confidence: 0.97998476

00:42:37.739 --> 00:42:39.260 We don't know why. There

NOTE Confidence: 0.97998476

00:42:39.260 --> 00:42:40.780 have been many many efforts

NOTE Confidence: 0.97998476

00:42:40.780 --> 00:42:41.520 to understand

NOTE Confidence: 0.9505639

00:42:42.060 --> 00:42:43.500 to identify who's gonna be

NOTE Confidence: 0.9505639

00:42:43.500 --> 00:42:44.620 a responder and who's gonna

NOTE Confidence: 0.9505639

00:42:44.620 --> 00:42:45.660 be a non responder to

NOTE Confidence: 0.9505639

00:42:45.660 --> 00:42:47.020 a balloon pump, and they've

NOTE Confidence: 0.9505639

00:42:47.020 --> 00:42:48.984 all they've all failed when

NOTE Confidence: 0.9505639

00:42:48.984 --> 00:42:50.285 they've been tested prospectively.

NOTE Confidence: 0.97261894

00:42:50.744 --> 00:42:51.705 This to me was the

NOTE Confidence: 0.97261894

00:42:51.705 --> 00:42:53.464 best review article that kind

NOTE Confidence: 0.97261894

00:42:53.464 --> 00:42:54.665 of brought all those data

NOTE Confidence: 0.97261894

00:42:54.665 --> 00:42:55.165 together

NOTE Confidence: 0.9218998

00:42:55.625 --> 00:42:56.685 and identified,

NOTE Confidence: 0.8804714

00:42:57.785 --> 00:42:58.285 phenotypes.

NOTE Confidence: 0.99044067

00:42:58.585 --> 00:42:59.724 What are the characteristics

NOTE Confidence: 0.79311234

00:43:00.185 --> 00:43:01.325 tend to be the characteristics

NOTE Confidence: 0.79311234

00:43:01.385 --> 00:43:02.665 of people who tend to

NOTE Confidence: 0.79311234

00:43:02.665 --> 00:43:03.560 respond, respond,

NOTE Confidence: 0.8290195

00:43:04.820 --> 00:43:05.686 you know, heart failure over

NOTE Confidence: 0.8290195

00:43:05.686 --> 00:43:05.860 AMI,

NOTE Confidence: 0.8853195

00:43:06.580 --> 00:43:07.800 preserved RV function,

NOTE Confidence: 0.9514143

00:43:08.500 --> 00:43:09.800 high afterload resistance,

NOTE Confidence: 0.94333917

00:43:11.280 --> 00:43:12.440 not in,

NOTE Confidence: 0.7404928

00:43:13.620 --> 00:43:14.120 not

NOTE Confidence: 0.5541198

00:43:14.420 --> 00:43:16.120 in not in severe

NOTE Confidence: 0.8987675

00:43:17.915 --> 00:43:18.575 pulmonary congestion.

NOTE Confidence: 0.9439836

00:43:19.114 --> 00:43:20.875 Also have a relatively, you

NOTE Confidence: 0.9439836

00:43:20.875 --> 00:43:22.175 know, not a very high

NOTE Confidence: 0.9439836

00:43:22.395 --> 00:43:22.895 tachycardia.

NOTE Confidence: 0.95729655

00:43:23.515 --> 00:43:24.875 But when this when all

NOTE Confidence: 0.95729655

00:43:24.875 --> 00:43:25.675 attempts to,

NOTE Confidence: 0.9997052

00:43:26.235 --> 00:43:27.614 put this into an algorithm

NOTE Confidence: 0.92428064

00:43:27.995 --> 00:43:28.955 to say this is gonna

NOTE Confidence: 0.92428064

00:43:28.955 --> 00:43:30.315 be a responder and that's

NOTE Confidence: 0.92428064

00:43:30.315 --> 00:43:31.435 not gonna be have have

NOTE Confidence: 0.92428064

00:43:31.435 --> 00:43:32.175 all failed.

NOTE Confidence: 0.937942

00:43:32.610 --> 00:43:34.130 So what we always talk

NOTE Confidence: 0.937942

00:43:34.130 --> 00:43:35.570 about is okay, if you're

NOTE Confidence: 0.937942

00:43:35.570 --> 00:43:37.010 gonna use a balloon, no

NOTE Confidence: 0.937942

00:43:37.010 --> 00:43:37.510 problem.

NOTE Confidence: 0.9374914

00:43:37.810 --> 00:43:39.010 But you know, have a

NOTE Confidence: 0.9374914

00:43:39.010 --> 00:43:40.530 right heart cath in, have

NOTE Confidence: 0.9374914

00:43:40.530 --> 00:43:41.190 a target

NOTE Confidence: 0.8887377

00:43:41.490 --> 00:43:42.770 and know if the patient's

NOTE Confidence: 0.8887377

00:43:42.770 --> 00:43:43.810 gonna respond and if they

NOTE Confidence: 0.8887377

00:43:43.810 --> 00:43:44.630 don't respond,

NOTE Confidence: 0.91362715

00:43:45.015 --> 00:43:46.135 escalate as soon as you

NOTE Confidence: 0.91362715

00:43:46.135 --> 00:43:48.535 can. Because time is really

NOTE Confidence: 0.91362715

00:43:48.535 --> 00:43:49.734 a big problem as what

NOTE Confidence: 0.91362715

00:43:49.734 --> 00:43:50.855 I already said and we'll

NOTE Confidence: 0.91362715

00:43:50.855 --> 00:43:51.815 we'll talk a little bit

NOTE Confidence: 0.91362715

00:43:51.815 --> 00:43:52.795 more about time.

NOTE Confidence: 0.9501195

00:43:53.575 --> 00:43:54.614 And that's where I think,

NOTE Confidence: 0.8850657

00:43:55.255 --> 00:43:57.870 some algorithms, some hospitals have

NOTE Confidence: 0.8850657

00:43:58.110 --> 00:44:00.290 a a, for AMI shock

NOTE Confidence: 0.8850657

00:44:00.350 --> 00:44:01.170 have a policy

NOTE Confidence: 0.61980075

00:44:01.550 --> 00:44:02.450 if they initiate

NOTE Confidence: 0.9148793

00:44:03.310 --> 00:44:04.050 a MCS,

NOTE Confidence: 0.980389

00:44:04.430 --> 00:44:05.550 they don't leave the cath

NOTE Confidence: 0.980389

00:44:05.550 --> 00:44:07.470 lab until they have reached

NOTE Confidence: 0.980389

00:44:07.470 --> 00:44:08.990 a hemodynamic goal with the

NOTE Confidence: 0.980389

00:44:08.990 --> 00:44:10.270 device that they've chosen. So

NOTE Confidence: 0.980389

00:44:10.270 --> 00:44:11.090 if you choose

NOTE Confidence: 0.9266402

00:44:12.325 --> 00:44:14.085 balloon pump first, fifteen minutes

NOTE Confidence: 0.9266402

00:44:14.085 --> 00:44:14.585 later,

NOTE Confidence: 0.90704364

00:44:15.045 --> 00:44:15.705 not improving,

NOTE Confidence: 0.9784766

00:44:16.565 --> 00:44:17.065 escalate.

NOTE Confidence: 0.9734516

00:44:17.445 --> 00:44:18.725 Same thing for Impella. If

NOTE Confidence: 0.9734516

00:44:18.725 --> 00:44:19.605 you're if you have an

NOTE Confidence: 0.9734516

00:44:19.605 --> 00:44:21.205 Impella CP and you're not

NOTE Confidence: 0.9734516

00:44:21.205 --> 00:44:23.285 achieving your goals, escalate either

NOTE Confidence: 0.9734516

00:44:23.285 --> 00:44:24.485 to VA ECMO or get

NOTE Confidence: 0.9734516

00:44:24.485 --> 00:44:25.445 your surgeons to do a

NOTE Confidence: 0.9734516

00:44:25.445 --> 00:44:26.185 five five.

NOTE Confidence: 0.99542904

00:44:26.500 --> 00:44:27.940 So that is that makes

NOTE Confidence: 0.99542904

00:44:27.940 --> 00:44:28.820 a lot of sense.

NOTE Confidence: 0.967935

00:44:29.140 --> 00:44:30.660 Time is is very important

NOTE Confidence: 0.967935

00:44:30.660 --> 00:44:31.160 factor.

NOTE Confidence: 0.98861015

00:44:32.420 --> 00:44:33.960 What about VA ECMO?

NOTE Confidence: 0.9237642

00:44:34.820 --> 00:44:36.020 This is the physiology of

NOTE Confidence: 0.9237642

00:44:36.020 --> 00:44:37.860 VA ECMO which is is

NOTE Confidence: 0.9237642

00:44:37.860 --> 00:44:38.755 a little bit counterintuitive in

NOTE Confidence: 0.9237642

00:44:38.755 --> 00:44:39.255 a

NOTE Confidence: 0.90303725

00:44:39.555 --> 00:44:40.295 way because

NOTE Confidence: 0.98097044

00:44:40.755 --> 00:44:42.594 VA ECMO diverts blood away

NOTE Confidence: 0.98097044

00:44:42.594 --> 00:44:43.795 from the heart. It reduces

NOTE Confidence: 0.98097044

00:44:43.795 --> 00:44:44.915 the venous return to the

NOTE Confidence: 0.98097044

00:44:44.915 --> 00:44:45.415 heart.

NOTE Confidence: 0.955307

00:44:46.355 --> 00:44:46.855 Yet

NOTE Confidence: 0.9312528

00:44:47.475 --> 00:44:48.594 what we what you see

NOTE Confidence: 0.9312528

00:44:48.594 --> 00:44:50.035 here on the pressure volume

NOTE Confidence: 0.9312528

00:44:50.035 --> 00:44:51.555 loops is that the VA

NOTE Confidence: 0.9312528

00:44:51.555 --> 00:44:53.575 ECMO actually loads the heart.

NOTE Confidence: 0.99489003

00:44:54.380 --> 00:44:56.060 Even though it diverts away,

NOTE Confidence: 0.81175077

00:44:56.460 --> 00:44:57.440 Venus return

NOTE Confidence: 0.81091774

00:44:57.900 --> 00:44:59.580 in the end, the unlike

NOTE Confidence: 0.81091774

00:44:59.580 --> 00:45:00.239 an impeller,

NOTE Confidence: 0.9256338

00:45:00.620 --> 00:45:02.460 the VA, the heart itself

NOTE Confidence: 0.9256338

00:45:02.460 --> 00:45:03.500 has to pump blood from

NOTE Confidence: 0.9256338

00:45:03.500 --> 00:45:04.540 the ventricle to the a

NOTE Confidence: 0.9256338

00:45:04.540 --> 00:45:05.360 r artery.

NOTE Confidence: 0.95402575

00:45:05.900 --> 00:45:07.180 So if the patient's blood

NOTE Confidence: 0.95402575

00:45:07.180 --> 00:45:09.015 pressure goes up, the heart

NOTE Confidence: 0.95402575

00:45:09.015 --> 00:45:10.614 is pumping against the higher

NOTE Confidence: 0.95402575

00:45:10.614 --> 00:45:12.134 afterload pressure and to ink

NOTE Confidence: 0.95402575

00:45:12.295 --> 00:45:12.614 to,

NOTE Confidence: 0.98059595

00:45:13.255 --> 00:45:13.755 eject

NOTE Confidence: 0.948075

00:45:14.295 --> 00:45:16.635 the the residual venous return,

NOTE Confidence: 0.9857184

00:45:17.015 --> 00:45:18.214 it has to it will

NOTE Confidence: 0.9857184

00:45:18.214 --> 00:45:19.734 retain fluid so that it

NOTE Confidence: 0.9857184

00:45:19.734 --> 00:45:21.494 can achieve that higher pressure

NOTE Confidence: 0.9857184

00:45:21.494 --> 00:45:22.750 and eject the,

NOTE Confidence: 0.98579794

00:45:23.390 --> 00:45:24.430 eject the blood. There has

NOTE Confidence: 0.98579794

00:45:24.430 --> 00:45:25.950 to be a balance between

NOTE Confidence: 0.98579794

00:45:25.950 --> 00:45:27.890 venous return and and cardiac

NOTE Confidence: 0.98579794

00:45:27.950 --> 00:45:28.450 output.

NOTE Confidence: 0.9232251

00:45:29.150 --> 00:45:30.350 And there are many things

NOTE Confidence: 0.9232251

00:45:30.350 --> 00:45:31.390 that go along with this.

NOTE Confidence: 0.9232251

00:45:31.390 --> 00:45:32.750 Now not everyone that gets

NOTE Confidence: 0.9232251

00:45:32.750 --> 00:45:33.650 put on VAICMO

NOTE Confidence: 0.9561905

00:45:34.270 --> 00:45:35.810 responds like you see here.

NOTE Confidence: 0.9561905

00:45:35.915 --> 00:45:37.275 Probably about twenty to thirty

NOTE Confidence: 0.9561905

00:45:37.275 --> 00:45:38.635 percent of patients respond this

NOTE Confidence: 0.9561905

00:45:38.635 --> 00:45:39.835 way and that's why we

NOTE Confidence: 0.9561905

00:45:39.835 --> 00:45:41.295 need unloading strategies.

NOTE Confidence: 0.9797868

00:45:41.835 --> 00:45:42.875 But there are many things

NOTE Confidence: 0.9797868

00:45:42.875 --> 00:45:44.635 that go together with this

NOTE Confidence: 0.9797868

00:45:44.635 --> 00:45:46.395 loading and lack of aortic

NOTE Confidence: 0.9797868

00:45:46.395 --> 00:45:47.915 valve opening or reduction in

NOTE Confidence: 0.9797868

00:45:47.915 --> 00:45:49.435 aortic valve opening that I'm

NOTE Confidence: 0.9797868

00:45:49.435 --> 00:45:50.474 sure that you're all aware

NOTE Confidence: 0.9797868

00:45:50.474 --> 00:45:52.289 of. This is an aortogram

NOTE Confidence: 0.9797868

00:45:52.510 --> 00:45:53.869 of a patient on VA

NOTE Confidence: 0.9797868

00:45:53.869 --> 00:45:54.849 peripheral ECMO

NOTE Confidence: 0.8784596

00:45:55.150 --> 00:45:56.369 and you see the dye,

NOTE Confidence: 0.92908114

00:45:57.069 --> 00:45:58.349 injected into the or never

NOTE Confidence: 0.92908114

00:45:58.349 --> 00:46:00.109 gets below the diaphragm. So

NOTE Confidence: 0.92908114

00:46:00.109 --> 00:46:01.390 the superior part of the

NOTE Confidence: 0.92908114

00:46:01.390 --> 00:46:02.670 body is perfused from the

NOTE Confidence: 0.92908114

00:46:02.670 --> 00:46:03.170 heart,

NOTE Confidence: 0.8845848

00:46:03.775 --> 00:46:05.215 the inferior parts perfused from

NOTE Confidence: 0.8845848

00:46:05.215 --> 00:46:06.275 the ECMO.

NOTE Confidence: 0.9403996

00:46:06.575 --> 00:46:07.455 So if the patient is

NOTE Confidence: 0.9403996

00:46:07.455 --> 00:46:08.594 in pulmonary edema,

NOTE Confidence: 0.95695317

00:46:08.895 --> 00:46:10.575 you're perfusing the brain with

NOTE Confidence: 0.95695317

00:46:10.575 --> 00:46:11.935 deoxygenated blood and you know

NOTE Confidence: 0.95695317

00:46:11.935 --> 00:46:12.735 how that you can use

NOTE Confidence: 0.95695317

00:46:12.735 --> 00:46:13.955 near infrared spectroscopy,

NOTE Confidence: 0.988951

00:46:15.135 --> 00:46:17.450 right radial artery oxygen saturations

NOTE Confidence: 0.988951

00:46:17.670 --> 00:46:18.790 to really look and see

NOTE Confidence: 0.988951

00:46:18.790 --> 00:46:20.010 if you're in this situation.

NOTE Confidence: 0.9671718

00:46:20.630 --> 00:46:22.070 But also going along with

NOTE Confidence: 0.9671718

00:46:22.070 --> 00:46:23.530 this is a more extreme

NOTE Confidence: 0.9671718

00:46:23.590 --> 00:46:25.430 example where the aortic valve

NOTE Confidence: 0.9671718

00:46:25.430 --> 00:46:26.950 is not even opening. And

NOTE Confidence: 0.9671718

00:46:26.950 --> 00:46:28.230 that then becomes in my

NOTE Confidence: 0.9671718

00:46:28.230 --> 00:46:29.430 mind kind of a medical

NOTE Confidence: 0.9671718

00:46:29.430 --> 00:46:31.535 emergency in the sense because

NOTE Confidence: 0.9796054

00:46:31.915 --> 00:46:33.295 aortic valve not opening

NOTE Confidence: 0.9502179

00:46:33.594 --> 00:46:36.335 goes along with pulmonary congestion

NOTE Confidence: 0.84071124

00:46:37.035 --> 00:46:38.974 in worsening markedly worsening

NOTE Confidence: 0.73725235

00:46:39.515 --> 00:46:40.255 or inducing

NOTE Confidence: 0.8591265

00:46:40.954 --> 00:46:42.015 pulmonary edema

NOTE Confidence: 0.8181923

00:46:42.555 --> 00:46:43.614 and then also

NOTE Confidence: 0.9709795

00:46:45.030 --> 00:46:46.230 stasis of blood in the

NOTE Confidence: 0.9709795

00:46:46.230 --> 00:46:46.730 ventricle,

NOTE Confidence: 0.9992266

00:46:47.670 --> 00:46:49.290 and development of

NOTE Confidence: 0.9015403

00:46:49.830 --> 00:46:51.190 of clots in the ventricle.

NOTE Confidence: 0.9015403

00:46:51.190 --> 00:46:51.830 I don't know if these

NOTE Confidence: 0.9015403

00:46:51.830 --> 00:46:52.950 videos are oh yeah. So

NOTE Confidence: 0.9015403

00:46:52.950 --> 00:46:54.870 here's another patient on VA

NOTE Confidence: 0.9015403

00:46:54.870 --> 00:46:56.489 ECMA completely closed

NOTE Confidence: 0.9756644

00:46:56.790 --> 00:46:57.910 aortic valve and you can

NOTE Confidence: 0.9756644

00:46:57.910 --> 00:46:58.730 see the smoke

NOTE Confidence: 0.9380075

00:46:59.085 --> 00:47:00.605 echogenic smoke in the aortic

NOTE Confidence: 0.9380075

00:47:00.605 --> 00:47:01.744 and the and the ventricular

NOTE Confidence: 0.9380075

00:47:01.965 --> 00:47:03.645 and aorta, and then that

NOTE Confidence: 0.9380075

00:47:03.645 --> 00:47:04.685 can lead to these kinds

NOTE Confidence: 0.9380075

00:47:04.685 --> 00:47:06.125 of things that you don't

NOTE Confidence: 0.9380075

00:47:06.125 --> 00:47:06.844 wanna see.

NOTE Confidence: 0.968328

00:47:07.165 --> 00:47:08.385 This is a thrombosis

NOTE Confidence: 0.96100503

00:47:08.685 --> 00:47:10.445 in the aortic root, here's

NOTE Confidence: 0.96100503

00:47:10.445 --> 00:47:11.665 a completely thrombosed

NOTE Confidence: 0.93081445

00:47:12.830 --> 00:47:14.750 a completely thrombosed ventricle and

NOTE Confidence: 0.93081445

00:47:14.750 --> 00:47:16.110 you if this would play,

NOTE Confidence: 0.93081445

00:47:16.110 --> 00:47:16.830 you would see this the

NOTE Confidence: 0.93081445

00:47:16.830 --> 00:47:18.590 ventricles kinda quivering around this

NOTE Confidence: 0.93081445

00:47:18.590 --> 00:47:20.030 complete, you know, thrombus of

NOTE Confidence: 0.93081445

00:47:20.030 --> 00:47:21.890 the entire the entire ventricle.

NOTE Confidence: 0.9547789

00:47:25.655 --> 00:47:26.935 So this is the, the

NOTE Confidence: 0.9547789

00:47:26.935 --> 00:47:28.614 ECLS shock the results of

NOTE Confidence: 0.9547789

00:47:28.614 --> 00:47:30.135 the ECLS shock study again

NOTE Confidence: 0.9547789

00:47:30.135 --> 00:47:31.035 run-in Germany,

NOTE Confidence: 0.96416885

00:47:31.895 --> 00:47:32.875 which was negative.

NOTE Confidence: 0.9899828

00:47:33.575 --> 00:47:34.614 But, you know, the thing

NOTE Confidence: 0.9899828

00:47:34.614 --> 00:47:36.135 about both the IBP shock

NOTE Confidence: 0.9899828

00:47:36.135 --> 00:47:37.575 trial and the ECLS shock

NOTE Confidence: 0.9899828

00:47:37.575 --> 00:47:39.230 trial is they just use

NOTE Confidence: 0.9899828

00:47:39.230 --> 00:47:40.609 these devices indiscriminately

NOTE Confidence: 0.99665534

00:47:40.989 --> 00:47:41.489 without

NOTE Confidence: 0.93004835

00:47:41.869 --> 00:47:43.969 any bailout, without any

NOTE Confidence: 0.935213

00:47:44.270 --> 00:47:46.290 human dynamic guidance, without any

NOTE Confidence: 0.935213

00:47:46.589 --> 00:47:47.869 algorithm for how to manage

NOTE Confidence: 0.935213

00:47:47.869 --> 00:47:48.989 the patients. And when you

NOTE Confidence: 0.935213

00:47:48.989 --> 00:47:50.270 do that, I think you're

NOTE Confidence: 0.935213

00:47:50.270 --> 00:47:51.994 gonna get a negative trial.

NOTE Confidence: 0.935213

00:47:52.214 --> 00:47:53.174 And you know, I think

NOTE Confidence: 0.935213

00:47:53.174 --> 00:47:54.555 what we learned from danger,

NOTE Confidence: 0.9752882

00:47:55.815 --> 00:47:57.114 which could have been predicted

NOTE Confidence: 0.9752882

00:47:57.174 --> 00:47:58.375 for for these trials as

NOTE Confidence: 0.9752882

00:47:58.375 --> 00:47:59.734 well is you you have

NOTE Confidence: 0.9752882

00:47:59.734 --> 00:48:01.094 to have some guidance on

NOTE Confidence: 0.9752882

00:48:01.094 --> 00:48:02.535 on how to use how

NOTE Confidence: 0.9752882

00:48:02.535 --> 00:48:03.835 do you use these devices

NOTE Confidence: 0.9752882

00:48:03.894 --> 00:48:04.394 properly.

NOTE Confidence: 0.9873154

00:48:07.589 --> 00:48:09.510 So there are nine ways

NOTE Confidence: 0.9873154

00:48:09.510 --> 00:48:10.410 to deal with

NOTE Confidence: 0.85842913

00:48:11.190 --> 00:48:13.450 overload and aortic valve closure,

NOTE Confidence: 0.97549254

00:48:14.150 --> 00:48:15.109 in in the setting of

NOTE Confidence: 0.97549254

00:48:15.109 --> 00:48:16.150 ECMO. I'm not gonna go

NOTE Confidence: 0.97549254

00:48:16.150 --> 00:48:17.670 through this, but it is

NOTE Confidence: 0.97549254

00:48:17.670 --> 00:48:19.510 relevant to know these these

NOTE Confidence: 0.97549254

00:48:19.510 --> 00:48:20.329 different ways

NOTE Confidence: 0.9368418

00:48:20.735 --> 00:48:21.775 and also to know when

NOTE Confidence: 0.9368418

00:48:21.775 --> 00:48:23.215 they're useful and when and

NOTE Confidence: 0.9368418

00:48:23.215 --> 00:48:24.335 some of these are certain

NOTE Confidence: 0.9368418

00:48:24.335 --> 00:48:26.035 circumstances when these are actually

NOTE Confidence: 0.9368418

00:48:26.175 --> 00:48:27.395 even contra indicated

NOTE Confidence: 0.92141193

00:48:27.775 --> 00:48:28.895 and is relevant to know,

NOTE Confidence: 0.92141193

00:48:29.135 --> 00:48:30.655 when especially when they're contra

NOTE Confidence: 0.92141193

00:48:30.655 --> 00:48:31.155 indicated.

NOTE Confidence: 0.9609077

00:48:31.535 --> 00:48:32.975 And this is one, one

NOTE Confidence: 0.9609077

00:48:32.975 --> 00:48:34.830 approach which is most very

NOTE Confidence: 0.9609077

00:48:34.830 --> 00:48:36.110 popular now which is combining

NOTE Confidence: 0.9609077

00:48:36.110 --> 00:48:37.250 ECMO with Impella

NOTE Confidence: 0.95107895

00:48:37.870 --> 00:48:39.970 either as a primary strategy

NOTE Confidence: 0.95107895

00:48:40.110 --> 00:48:42.290 or going from ECMO to

NOTE Confidence: 0.95107895

00:48:42.510 --> 00:48:44.770 adding Impella or from Impella

NOTE Confidence: 0.95107895

00:48:44.830 --> 00:48:46.050 and adding ECMO.

NOTE Confidence: 0.9372585

00:48:47.075 --> 00:48:48.434 And this just shows that,

NOTE Confidence: 0.9372585

00:48:48.835 --> 00:48:49.734 from the physiology

NOTE Confidence: 0.8682192

00:48:50.035 --> 00:48:52.055 perspective you can very easily,

NOTE Confidence: 0.9565657

00:48:52.674 --> 00:48:54.055 deal with all of the

NOTE Confidence: 0.9565657

00:48:54.114 --> 00:48:54.614 consequences

NOTE Confidence: 0.99589795

00:48:55.075 --> 00:48:56.214 of ECMO loading

NOTE Confidence: 0.75776863

00:48:56.594 --> 00:48:58.214 the with, with an Impella.

NOTE Confidence: 0.8426954

00:48:59.570 --> 00:49:01.090 And just here's one actual

NOTE Confidence: 0.8426954

00:49:01.170 --> 00:49:02.710 this is actual patient example.

NOTE Confidence: 0.98509645

00:49:03.650 --> 00:49:05.989 Patient presented with profound shock

NOTE Confidence: 0.9525347

00:49:06.450 --> 00:49:06.950 and

NOTE Confidence: 0.9026994

00:49:07.410 --> 00:49:08.950 a wedge of almost forty

NOTE Confidence: 0.9026994

00:49:09.010 --> 00:49:10.610 crashed onto ECMO, wedge went

NOTE Confidence: 0.9026994

00:49:10.610 --> 00:49:12.390 up further and then Impella

NOTE Confidence: 0.9026994

00:49:12.450 --> 00:49:13.890 CP was put and then

NOTE Confidence: 0.9026994

00:49:13.890 --> 00:49:14.390 the

NOTE Confidence: 0.97409695

00:49:15.035 --> 00:49:16.415 the wedge went down markedly.

NOTE Confidence: 0.97409695

00:49:16.555 --> 00:49:17.435 You don't need a lot

NOTE Confidence: 0.97409695

00:49:17.435 --> 00:49:18.175 of unloading,

NOTE Confidence: 0.9216655

00:49:19.475 --> 00:49:20.635 a lot of flow from

NOTE Confidence: 0.9216655

00:49:20.635 --> 00:49:22.395 the Impella to achieve this

NOTE Confidence: 0.9216655

00:49:22.395 --> 00:49:23.275 because all you have to

NOTE Confidence: 0.9216655

00:49:23.275 --> 00:49:24.155 do is balance out the

NOTE Confidence: 0.9216655

00:49:24.155 --> 00:49:26.155 residual Venus return which might

NOTE Confidence: 0.9216655

00:49:26.155 --> 00:49:27.275 only be one or one

NOTE Confidence: 0.9216655

00:49:27.275 --> 00:49:28.575 or one to two liters

NOTE Confidence: 0.9216655

00:49:28.875 --> 00:49:29.535 a minute.

NOTE Confidence: 0.99772626

00:49:30.670 --> 00:49:31.710 So this can be very

NOTE Confidence: 0.99772626

00:49:31.710 --> 00:49:32.210 effective.

NOTE Confidence: 0.99628955

00:49:33.630 --> 00:49:35.150 There are two studies going

NOTE Confidence: 0.99628955

00:49:35.150 --> 00:49:36.190 on now that are looking

NOTE Confidence: 0.99628955

00:49:36.190 --> 00:49:36.930 at loading,

NOTE Confidence: 0.9353032

00:49:37.230 --> 00:49:37.730 unloading,

NOTE Confidence: 0.92163813

00:49:38.190 --> 00:49:40.350 strategies for in combination with,

NOTE Confidence: 0.92163813

00:49:40.510 --> 00:49:42.190 with ECMOBIs again are are

NOTE Confidence: 0.92163813

00:49:42.190 --> 00:49:44.130 all occurring in, in Europe.

NOTE Confidence: 0.9768338

00:49:45.475 --> 00:49:46.994 So in the, the last

NOTE Confidence: 0.9768338

00:49:46.994 --> 00:49:47.655 few minutes,

NOTE Confidence: 0.9766277

00:49:48.435 --> 00:49:49.875 I just wanna talk about,

NOTE Confidence: 0.9766277

00:49:49.875 --> 00:49:51.635 you know, what where what

NOTE Confidence: 0.9766277

00:49:51.635 --> 00:49:52.675 can we in the United

NOTE Confidence: 0.9766277

00:49:52.675 --> 00:49:53.494 States do

NOTE Confidence: 0.8768741

00:49:53.875 --> 00:49:55.734 to advance the field?

NOTE Confidence: 0.9732136

00:49:56.355 --> 00:49:57.315 If we're not gonna be

NOTE Confidence: 0.9732136

00:49:57.315 --> 00:49:58.295 able to do,

NOTE Confidence: 0.9769355

00:49:58.920 --> 00:50:00.920 to do randomized trials, what

NOTE Confidence: 0.9769355

00:50:00.920 --> 00:50:01.880 what can we do? Just

NOTE Confidence: 0.9769355

00:50:01.880 --> 00:50:03.000 sit back and let everything

NOTE Confidence: 0.9769355

00:50:03.000 --> 00:50:03.900 happen in Europe?

NOTE Confidence: 0.99196595

00:50:04.920 --> 00:50:06.299 So there are two reasons

NOTE Confidence: 0.99196595

00:50:06.440 --> 00:50:07.400 to to do,

NOTE Confidence: 0.9944248

00:50:07.799 --> 00:50:09.079 to advance the science and

NOTE Confidence: 0.9944248

00:50:09.079 --> 00:50:10.700 the and the clinical care.

NOTE Confidence: 0.9894856

00:50:11.285 --> 00:50:13.205 One is to get FDA

NOTE Confidence: 0.9894856

00:50:13.205 --> 00:50:14.425 approval of new devices

NOTE Confidence: 0.9406072

00:50:14.805 --> 00:50:15.925 and the other is to

NOTE Confidence: 0.9406072

00:50:15.925 --> 00:50:17.445 influence the guidelines which are

NOTE Confidence: 0.9406072

00:50:17.445 --> 00:50:18.505 really in the end

NOTE Confidence: 0.96077114

00:50:18.885 --> 00:50:20.825 what, you know, practicing clinicians

NOTE Confidence: 0.96077114

00:50:20.965 --> 00:50:21.945 really look to,

NOTE Confidence: 0.9679108

00:50:22.485 --> 00:50:23.925 to, you know, to to

NOTE Confidence: 0.9679108

00:50:23.925 --> 00:50:25.045 guide their what they do.

NOTE Confidence: 0.9679108

00:50:25.045 --> 00:50:26.265 That's why they're called guidelines.

NOTE Confidence: 0.99166

00:50:27.119 --> 00:50:27.560 So,

NOTE Confidence: 0.98554003

00:50:28.000 --> 00:50:28.819 one example,

NOTE Confidence: 0.9635121

00:50:29.440 --> 00:50:30.799 that's that's being that has

NOTE Confidence: 0.9635121

00:50:30.799 --> 00:50:32.980 been initiate initiated by Abiomed

NOTE Confidence: 0.967552

00:50:33.680 --> 00:50:34.799 is the what's called the

NOTE Confidence: 0.967552

00:50:34.799 --> 00:50:35.299 OASIS,

NOTE Confidence: 0.97530365

00:50:35.920 --> 00:50:36.900 study registry.

NOTE Confidence: 0.93887645

00:50:38.000 --> 00:50:40.160 They are educating sites on

NOTE Confidence: 0.93887645

00:50:40.160 --> 00:50:41.839 twelve core they're actually thirty

NOTE Confidence: 0.93887645

00:50:41.839 --> 00:50:43.244 one best practices of what

NOTE Confidence: 0.93887645

00:50:43.244 --> 00:50:44.224 should be done

NOTE Confidence: 0.9505268

00:50:44.525 --> 00:50:45.325 to when you in the

NOTE Confidence: 0.9505268

00:50:45.325 --> 00:50:47.005 care of a patient on

NOTE Confidence: 0.9505268

00:50:47.005 --> 00:50:47.505 Impella.

NOTE Confidence: 0.9602495

00:50:48.125 --> 00:50:49.585 And of those, they consider

NOTE Confidence: 0.9602495

00:50:49.644 --> 00:50:50.924 twelve of them them to

NOTE Confidence: 0.9602495

00:50:50.924 --> 00:50:52.065 be core competencies.

NOTE Confidence: 0.9957323

00:50:53.164 --> 00:50:54.625 They're they're listed here.

NOTE Confidence: 0.968338

00:50:55.980 --> 00:50:57.260 So they're going out and

NOTE Confidence: 0.968338

00:50:57.260 --> 00:50:58.400 educating sites,

NOTE Confidence: 0.99648225

00:50:59.260 --> 00:50:59.760 intensively

NOTE Confidence: 0.9655079

00:51:00.060 --> 00:51:01.600 about these core competencies.

NOTE Confidence: 0.9732359

00:51:03.100 --> 00:51:04.620 And, and then they're gonna

NOTE Confidence: 0.9732359

00:51:04.620 --> 00:51:05.440 do a registry,

NOTE Confidence: 0.96862

00:51:06.140 --> 00:51:07.820 to see, if if the

NOTE Confidence: 0.96862

00:51:07.820 --> 00:51:09.580 rates of adverse events, can

NOTE Confidence: 0.96862

00:51:09.580 --> 00:51:10.320 be reduced

NOTE Confidence: 0.98773956

00:51:10.704 --> 00:51:12.244 from historical controls.

NOTE Confidence: 0.9840147

00:51:12.625 --> 00:51:13.744 So that's one part of

NOTE Confidence: 0.9840147

00:51:13.744 --> 00:51:15.424 it, but I think that

NOTE Confidence: 0.9840147

00:51:15.424 --> 00:51:16.545 one of our efforts that

NOTE Confidence: 0.9840147

00:51:16.545 --> 00:51:18.565 we're working on, at CRF

NOTE Confidence: 0.94599164

00:51:19.184 --> 00:51:20.944 is actually to generate in

NOTE Confidence: 0.94599164

00:51:20.944 --> 00:51:22.325 parallel to this another,

NOTE Confidence: 0.9348051

00:51:22.830 --> 00:51:23.330 registry

NOTE Confidence: 0.93840086

00:51:23.630 --> 00:51:25.090 which is not being educated

NOTE Confidence: 0.93840086

00:51:25.230 --> 00:51:26.930 on these on these principles

NOTE Confidence: 0.93840086

00:51:27.230 --> 00:51:28.270 so that we'll have some

NOTE Confidence: 0.93840086

00:51:28.270 --> 00:51:29.790 kind of a a comparative

NOTE Confidence: 0.93840086

00:51:29.790 --> 00:51:30.670 group. I'll get a little

NOTE Confidence: 0.93840086

00:51:30.670 --> 00:51:31.870 bit more into that in

NOTE Confidence: 0.93840086

00:51:31.870 --> 00:51:32.690 just a minute.

NOTE Confidence: 0.96946156

00:51:33.150 --> 00:51:34.750 With regard to the development

NOTE Confidence: 0.96946156

00:51:34.750 --> 00:51:35.950 of new devices, there's a

NOTE Confidence: 0.96946156

00:51:35.950 --> 00:51:36.850 lot of activity.

NOTE Confidence: 0.9323089

00:51:38.214 --> 00:51:39.734 And really the, these are

NOTE Confidence: 0.9323089

00:51:39.734 --> 00:51:40.695 some of the these are

NOTE Confidence: 0.9323089

00:51:40.695 --> 00:51:41.655 the main ones that are

NOTE Confidence: 0.9323089

00:51:41.655 --> 00:51:42.155 being,

NOTE Confidence: 0.9472347

00:51:42.614 --> 00:51:44.375 under development. And the main

NOTE Confidence: 0.9472347

00:51:44.375 --> 00:51:44.875 reason,

NOTE Confidence: 0.9989165

00:51:45.494 --> 00:51:46.315 that's motivating

NOTE Confidence: 0.9863975

00:51:46.614 --> 00:51:48.395 the investment in these developments

NOTE Confidence: 0.9863975

00:51:48.614 --> 00:51:49.114 is,

NOTE Confidence: 0.99635404

00:51:49.655 --> 00:51:51.094 in reducing the French size

NOTE Confidence: 0.99635404

00:51:51.094 --> 00:51:51.915 for the introduction.

NOTE Confidence: 0.9878992

00:51:52.660 --> 00:51:53.960 So the the goal

NOTE Confidence: 0.98214066

00:51:54.260 --> 00:51:55.700 of of the industry now

NOTE Confidence: 0.98214066

00:51:55.700 --> 00:51:56.980 is to reduce French size

NOTE Confidence: 0.98214066

00:51:56.980 --> 00:51:58.520 and increase the flow capacity.

NOTE Confidence: 0.91496724

00:51:58.900 --> 00:51:59.400 So,

NOTE Confidence: 0.94753444

00:52:00.500 --> 00:52:02.020 five five of course is

NOTE Confidence: 0.94753444

00:52:02.020 --> 00:52:03.880 a surgical a surgical device.

NOTE Confidence: 0.94917953

00:52:04.820 --> 00:52:06.900 These devices over here are,

NOTE Confidence: 0.86198556

00:52:07.715 --> 00:52:08.614 are percutaneous

NOTE Confidence: 0.98734975

00:52:08.915 --> 00:52:10.755 devices. They go in at

NOTE Confidence: 0.98734975

00:52:10.755 --> 00:52:12.035 a French size of ten

NOTE Confidence: 0.98734975

00:52:12.035 --> 00:52:12.935 or nine French

NOTE Confidence: 0.9196071

00:52:13.235 --> 00:52:14.215 and they expand

NOTE Confidence: 0.9702653

00:52:14.594 --> 00:52:15.715 to a French size of

NOTE Confidence: 0.9702653

00:52:15.715 --> 00:52:17.475 twenty, two to twenty one

NOTE Confidence: 0.9702653

00:52:17.475 --> 00:52:17.975 French.

NOTE Confidence: 0.94971806

00:52:18.355 --> 00:52:19.875 And this the French size

NOTE Confidence: 0.94971806

00:52:19.875 --> 00:52:20.855 during the deployment

NOTE Confidence: 0.86479115

00:52:21.230 --> 00:52:22.989 here, during the while they're

NOTE Confidence: 0.86479115

00:52:22.989 --> 00:52:23.489 working

NOTE Confidence: 0.8968816

00:52:23.950 --> 00:52:25.950 that dictates their, their flow

NOTE Confidence: 0.8968816

00:52:25.950 --> 00:52:26.450 capacity.

NOTE Confidence: 0.9092

00:52:26.829 --> 00:52:28.029 So these devices have a

NOTE Confidence: 0.9092

00:52:28.029 --> 00:52:30.289 flow capacity the they're reported

NOTE Confidence: 0.7669496

00:52:30.670 --> 00:52:30.910 at,

NOTE Confidence: 0.9411116

00:52:31.789 --> 00:52:33.309 over five liters a minute

NOTE Confidence: 0.9411116

00:52:33.309 --> 00:52:34.670 comparable to five five. So

NOTE Confidence: 0.9411116

00:52:34.670 --> 00:52:36.635 now if these pan out

NOTE Confidence: 0.9411116

00:52:36.635 --> 00:52:37.695 these are very early,

NOTE Confidence: 0.922934

00:52:38.234 --> 00:52:39.375 you would have the potential

NOTE Confidence: 0.922934

00:52:39.594 --> 00:52:39.994 to

NOTE Confidence: 0.9268423

00:52:40.715 --> 00:52:42.555 to provide five five like

NOTE Confidence: 0.9268423

00:52:42.555 --> 00:52:44.094 support with a percutaneous

NOTE Confidence: 0.8905287

00:52:44.395 --> 00:52:46.175 device in the cath lab.

NOTE Confidence: 0.97534984

00:52:47.739 --> 00:52:49.180 So the the if we

NOTE Confidence: 0.97534984

00:52:49.180 --> 00:52:51.100 think about the development, the

NOTE Confidence: 0.97534984

00:52:51.100 --> 00:52:51.600 regulatory

NOTE Confidence: 0.9655628

00:52:52.060 --> 00:52:52.560 development,

NOTE Confidence: 0.8865559

00:52:53.739 --> 00:52:55.260 these p vads are used

NOTE Confidence: 0.8865559

00:52:55.260 --> 00:52:56.380 of course in high risk

NOTE Confidence: 0.8865559

00:52:56.380 --> 00:52:56.880 PCI

NOTE Confidence: 0.9846885

00:52:57.420 --> 00:52:59.180 and also for cardiogenic shock.

NOTE Confidence: 0.9846885

00:52:59.180 --> 00:53:00.380 They're used in both in

NOTE Confidence: 0.9846885

00:53:00.380 --> 00:53:02.140 both settings. In the setting

NOTE Confidence: 0.9846885

00:53:02.140 --> 00:53:03.075 of high risk PCI,

NOTE Confidence: 0.98609406

00:53:03.795 --> 00:53:05.234 the regulatory path to get

NOTE Confidence: 0.98609406

00:53:05.234 --> 00:53:07.255 these approved is relatively straightforward

NOTE Confidence: 0.98609406

00:53:07.315 --> 00:53:08.855 because they're used in elective

NOTE Confidence: 0.98609406

00:53:08.915 --> 00:53:10.275 cases. So you can go

NOTE Confidence: 0.98609406

00:53:10.275 --> 00:53:11.315 to a patient and say,

NOTE Confidence: 0.98609406

00:53:11.315 --> 00:53:12.355 look, we have a device.

NOTE Confidence: 0.98609406

00:53:12.355 --> 00:53:13.474 We think it's we think

NOTE Confidence: 0.98609406

00:53:13.474 --> 00:53:15.415 it's better. We can randomize

NOTE Confidence: 0.98609406

00:53:15.635 --> 00:53:16.915 you to either the standard

NOTE Confidence: 0.98609406

00:53:16.915 --> 00:53:17.974 or to the new device

NOTE Confidence: 0.9468467

00:53:18.430 --> 00:53:20.190 and no problem, those kind

NOTE Confidence: 0.9468467

00:53:20.190 --> 00:53:22.270 of trials will enroll relatively

NOTE Confidence: 0.9468467

00:53:22.270 --> 00:53:22.770 quickly.

NOTE Confidence: 0.99648887

00:53:23.150 --> 00:53:24.050 But for cardiogenic

NOTE Confidence: 0.9806933

00:53:24.350 --> 00:53:26.750 shock, it's really not not

NOTE Confidence: 0.9806933

00:53:26.750 --> 00:53:28.190 gonna be the case because

NOTE Confidence: 0.9806933

00:53:28.190 --> 00:53:29.310 of the urgency of the

NOTE Confidence: 0.9806933

00:53:29.310 --> 00:53:29.810 situation

NOTE Confidence: 0.98847663

00:53:30.110 --> 00:53:31.810 and the difficulty of randomizing

NOTE Confidence: 0.98847663

00:53:32.030 --> 00:53:33.310 patients in the setting of

NOTE Confidence: 0.98847663

00:53:33.310 --> 00:53:34.875 the urgent of the urgent

NOTE Confidence: 0.98847663

00:53:34.875 --> 00:53:35.375 setting.

NOTE Confidence: 0.98777306

00:53:35.835 --> 00:53:36.335 Again,

NOTE Confidence: 0.8940361

00:53:37.114 --> 00:53:38.975 we don't have this epic.

NOTE Confidence: 0.9036962

00:53:39.355 --> 00:53:41.055 It's very difficult to obtain,

NOTE Confidence: 0.9235146

00:53:43.195 --> 00:53:44.315 in in the context of

NOTE Confidence: 0.9235146

00:53:44.315 --> 00:53:45.295 a of a multicenter

NOTE Confidence: 0.994053

00:53:45.915 --> 00:53:46.415 study.

NOTE Confidence: 0.89850765

00:53:46.875 --> 00:53:47.355 So,

NOTE Confidence: 0.99778575

00:53:48.290 --> 00:53:49.489 is there what are the

NOTE Confidence: 0.99778575

00:53:49.489 --> 00:53:50.930 what are the options? What

NOTE Confidence: 0.99778575

00:53:50.930 --> 00:53:51.810 is what can we do

NOTE Confidence: 0.99778575

00:53:51.810 --> 00:53:53.349 instead of a randomized trial?

NOTE Confidence: 0.9929231

00:53:54.050 --> 00:53:55.489 So one thing that we

NOTE Confidence: 0.9929231

00:53:55.489 --> 00:53:57.349 could do is rely on,

NOTE Confidence: 0.9682611

00:53:57.810 --> 00:53:59.570 randomized studies conduct out of

NOTE Confidence: 0.9682611

00:53:59.570 --> 00:54:00.609 the US. We can just

NOTE Confidence: 0.9682611

00:54:00.609 --> 00:54:02.364 sit back, let everything happen,

NOTE Confidence: 0.9682611

00:54:02.585 --> 00:54:03.864 but the FDA does not

NOTE Confidence: 0.9682611

00:54:03.864 --> 00:54:05.065 allow that. In in order

NOTE Confidence: 0.9682611

00:54:05.065 --> 00:54:06.825 to get devices approved in

NOTE Confidence: 0.9682611

00:54:06.825 --> 00:54:07.944 the United States, they have

NOTE Confidence: 0.9682611

00:54:07.944 --> 00:54:09.545 to be tested in patients

NOTE Confidence: 0.9682611

00:54:09.545 --> 00:54:10.825 in the United States, in

NOTE Confidence: 0.9682611

00:54:10.825 --> 00:54:12.665 our health care system because

NOTE Confidence: 0.9682611

00:54:12.665 --> 00:54:13.405 there are

NOTE Confidence: 0.9376735

00:54:13.910 --> 00:54:15.750 differences in how devices are

NOTE Confidence: 0.9376735

00:54:15.750 --> 00:54:17.430 used in medical background, medical

NOTE Confidence: 0.9376735

00:54:17.430 --> 00:54:18.890 therapy and demographics.

NOTE Confidence: 0.982083

00:54:20.070 --> 00:54:21.510 You could develop what's called

NOTE Confidence: 0.982083

00:54:21.510 --> 00:54:23.610 an objective performance criteria OPC.

NOTE Confidence: 0.9554016

00:54:24.630 --> 00:54:26.650 This relies completely on historical

NOTE Confidence: 0.9554016

00:54:26.710 --> 00:54:27.135 data,

NOTE Confidence: 0.9679715

00:54:27.614 --> 00:54:28.815 But the only data that

NOTE Confidence: 0.9679715

00:54:28.815 --> 00:54:30.175 we have that's almost it's

NOTE Confidence: 0.9679715

00:54:30.175 --> 00:54:31.935 not really reliable even because

NOTE Confidence: 0.9679715

00:54:31.935 --> 00:54:33.455 it was never used for

NOTE Confidence: 0.9679715

00:54:33.455 --> 00:54:35.375 regulatory purpose is the danger

NOTE Confidence: 0.9679715

00:54:35.375 --> 00:54:37.055 shock trial. But the danger

NOTE Confidence: 0.9679715

00:54:37.055 --> 00:54:38.915 shock trial span ten years

NOTE Confidence: 0.9660772

00:54:39.215 --> 00:54:40.915 during which the device evolved,

NOTE Confidence: 0.998958

00:54:41.580 --> 00:54:42.080 practice

NOTE Confidence: 0.96158576

00:54:42.540 --> 00:54:44.239 evolved, medical therapies evolved.

NOTE Confidence: 0.9981122

00:54:44.620 --> 00:54:46.219 So we really cannot get

NOTE Confidence: 0.9981122

00:54:46.219 --> 00:54:46.960 an OPC

NOTE Confidence: 0.94004697

00:54:47.340 --> 00:54:49.040 from the danger shock trial.

NOTE Confidence: 0.9810756

00:54:49.500 --> 00:54:51.020 The other alternative is to

NOTE Confidence: 0.9810756

00:54:51.020 --> 00:54:52.300 develop is to use what's

NOTE Confidence: 0.9810756

00:54:52.300 --> 00:54:53.760 called an external database,

NOTE Confidence: 0.99599063

00:54:55.005 --> 00:54:56.285 that could be used with,

NOTE Confidence: 0.99599063

00:54:56.605 --> 00:54:57.984 for statistical matching

NOTE Confidence: 0.98415506

00:54:58.285 --> 00:54:59.964 to an industry sponsored single

NOTE Confidence: 0.98415506

00:54:59.964 --> 00:55:02.364 study, single arm study. And

NOTE Confidence: 0.98415506

00:55:02.364 --> 00:55:03.405 this is the approach that

NOTE Confidence: 0.98415506

00:55:03.405 --> 00:55:04.944 we're taking in two different

NOTE Confidence: 0.98415506

00:55:05.164 --> 00:55:06.224 domains. One

NOTE Confidence: 0.98965627

00:55:06.570 --> 00:55:07.690 is to try to develop

NOTE Confidence: 0.98965627

00:55:07.690 --> 00:55:08.810 a control group for the

NOTE Confidence: 0.98965627

00:55:08.810 --> 00:55:10.650 OASIS study, and the other

NOTE Confidence: 0.98965627

00:55:10.650 --> 00:55:11.870 is to try to develop

NOTE Confidence: 0.96575725

00:55:12.250 --> 00:55:12.489 a,

NOTE Confidence: 0.8912146

00:55:13.450 --> 00:55:15.130 a a control group for,

NOTE Confidence: 0.8912146

00:55:15.450 --> 00:55:17.450 for, new new new device

NOTE Confidence: 0.8912146

00:55:17.450 --> 00:55:17.950 development.

NOTE Confidence: 0.985199

00:55:18.489 --> 00:55:19.224 So So what is an

NOTE Confidence: 0.985199

00:55:19.224 --> 00:55:21.085 external database? It's a database

NOTE Confidence: 0.985199

00:55:21.145 --> 00:55:22.665 not collected directly within the

NOTE Confidence: 0.985199

00:55:22.665 --> 00:55:23.565 trial protocol,

NOTE Confidence: 0.9140809

00:55:23.945 --> 00:55:25.464 but used to support compare

NOTE Confidence: 0.9140809

00:55:25.464 --> 00:55:27.385 enhanced trial data. And there

NOTE Confidence: 0.9140809

00:55:27.385 --> 00:55:28.925 are many potential sources,

NOTE Confidence: 0.91829824

00:55:29.464 --> 00:55:30.844 electronic health records,

NOTE Confidence: 0.9484934

00:55:31.930 --> 00:55:33.450 they're not granular enough where

NOTE Confidence: 0.9484934

00:55:33.450 --> 00:55:35.130 we we and others have

NOTE Confidence: 0.9484934

00:55:35.130 --> 00:55:36.989 been using databases like Truveta,

NOTE Confidence: 0.9484934

00:55:37.130 --> 00:55:38.969 IQVIA, and trying to probe

NOTE Confidence: 0.9484934

00:55:38.969 --> 00:55:39.469 them

NOTE Confidence: 0.96725476

00:55:39.770 --> 00:55:41.690 for data of patients in

NOTE Confidence: 0.96725476

00:55:41.690 --> 00:55:43.690 shock. And it's extremely it's

NOTE Confidence: 0.96725476

00:55:43.690 --> 00:55:45.885 still extremely difficult to extract

NOTE Confidence: 0.96725476

00:55:45.885 --> 00:55:47.745 data even with, with with

NOTE Confidence: 0.96725476

00:55:47.885 --> 00:55:48.385 AI,

NOTE Confidence: 0.71872

00:55:50.045 --> 00:55:51.585 natural language algorithms

NOTE Confidence: 0.9477155

00:55:52.125 --> 00:55:53.825 still very difficult to extract

NOTE Confidence: 0.9477155

00:55:53.965 --> 00:55:55.405 the granular data that we

NOTE Confidence: 0.9477155

00:55:55.405 --> 00:55:56.545 need for that.

NOTE Confidence: 0.8806087

00:55:56.859 --> 00:55:57.680 Claims databases.

NOTE Confidence: 0.9391415

00:55:58.380 --> 00:55:58.880 Historically,

NOTE Confidence: 0.9949824

00:55:59.180 --> 00:56:01.420 these were used to to

NOTE Confidence: 0.9949824

00:56:01.420 --> 00:56:02.940 tell people that Impella was

NOTE Confidence: 0.9949824

00:56:02.940 --> 00:56:04.619 bad. There were two two

NOTE Confidence: 0.9949824

00:56:04.619 --> 00:56:06.140 important two studies that were

NOTE Confidence: 0.9949824

00:56:06.140 --> 00:56:06.640 published

NOTE Confidence: 0.97902095

00:56:06.940 --> 00:56:08.079 using electronic,

NOTE Confidence: 0.99928916

00:56:09.420 --> 00:56:10.239 health records

NOTE Confidence: 0.984701

00:56:10.619 --> 00:56:11.839 and claims data.

NOTE Confidence: 0.90272146

00:56:12.155 --> 00:56:13.535 The set the third one

NOTE Confidence: 0.90272146

00:56:13.594 --> 00:56:15.435 that that concluded that Impella

NOTE Confidence: 0.90272146

00:56:15.435 --> 00:56:16.335 worsened outcomes.

NOTE Confidence: 0.9577162

00:56:16.875 --> 00:56:17.375 And,

NOTE Confidence: 0.99766713

00:56:17.835 --> 00:56:18.954 these were published in high

NOTE Confidence: 0.99766713

00:56:18.954 --> 00:56:20.015 profile journals

NOTE Confidence: 0.9759245

00:56:20.315 --> 00:56:21.594 and, and gave a lot

NOTE Confidence: 0.9759245

00:56:21.594 --> 00:56:22.714 of angst to a lot

NOTE Confidence: 0.9759245

00:56:22.714 --> 00:56:24.175 of people including the FDA.

NOTE Confidence: 0.9982343

00:56:24.954 --> 00:56:25.835 But they turned out to

NOTE Confidence: 0.9982343

00:56:25.835 --> 00:56:26.494 be wrong.

NOTE Confidence: 0.8150894

00:56:27.460 --> 00:56:27.960 Registries.

NOTE Confidence: 0.94711316

00:56:29.300 --> 00:56:30.040 So registries,

NOTE Confidence: 0.9759986

00:56:30.820 --> 00:56:32.739 disease specific or treatment specific

NOTE Confidence: 0.9759986

00:56:32.739 --> 00:56:33.239 databases

NOTE Confidence: 0.95144767

00:56:33.700 --> 00:56:35.460 that exist. So for example,

NOTE Confidence: 0.95144767

00:56:35.460 --> 00:56:36.600 could we use the cardiogenic

NOTE Confidence: 0.95144767

00:56:36.660 --> 00:56:37.960 shock working group or the

NOTE Confidence: 0.95144767

00:56:38.180 --> 00:56:39.844 working group? The answer is

NOTE Confidence: 0.95144767

00:56:39.844 --> 00:56:41.684 no. Not for regulatory purposes.

NOTE Confidence: 0.95144767

00:56:41.684 --> 00:56:43.285 These are not calc these

NOTE Confidence: 0.95144767

00:56:43.285 --> 00:56:45.125 are not these databases are

NOTE Confidence: 0.95144767

00:56:45.125 --> 00:56:45.864 not collected

NOTE Confidence: 0.9385136

00:56:46.244 --> 00:56:47.145 with the rigor,

NOTE Confidence: 0.999207

00:56:47.605 --> 00:56:49.545 the regulatory rigor that's required

NOTE Confidence: 0.99611205

00:56:49.924 --> 00:56:51.625 to to submit to regulatory

NOTE Confidence: 0.99611205

00:56:51.844 --> 00:56:52.344 agencies.

NOTE Confidence: 0.94912076

00:56:53.289 --> 00:56:55.369 Historical controls don't work and

NOTE Confidence: 0.94912076

00:56:55.369 --> 00:56:56.650 really what all we're left

NOTE Confidence: 0.94912076

00:56:56.650 --> 00:56:58.010 with really is this real

NOTE Confidence: 0.94912076

00:56:58.010 --> 00:56:59.549 real world, evidence.

NOTE Confidence: 0.9581481

00:57:00.170 --> 00:57:01.450 So this is what we

NOTE Confidence: 0.9581481

00:57:01.450 --> 00:57:02.890 are, this is what we're,

NOTE Confidence: 0.9581481

00:57:03.210 --> 00:57:04.410 kind of pursuing now. We're

NOTE Confidence: 0.9581481

00:57:04.410 --> 00:57:05.529 in the early stages of

NOTE Confidence: 0.9581481

00:57:05.529 --> 00:57:06.750 of developing this.

NOTE Confidence: 0.9923646

00:57:07.529 --> 00:57:08.785 One of the things that

NOTE Confidence: 0.9923646

00:57:08.785 --> 00:57:10.145 we wanna do differently than

NOTE Confidence: 0.9923646

00:57:10.145 --> 00:57:11.665 all the other registries is

NOTE Confidence: 0.9923646

00:57:11.665 --> 00:57:13.265 to provide funding to the

NOTE Confidence: 0.9923646

00:57:13.265 --> 00:57:13.765 sites

NOTE Confidence: 0.96013683

00:57:14.065 --> 00:57:14.945 so that they have the

NOTE Confidence: 0.96013683

00:57:14.945 --> 00:57:16.545 appropriate resources to collect the

NOTE Confidence: 0.96013683

00:57:16.545 --> 00:57:18.305 appropriate data. That's the difference

NOTE Confidence: 0.96013683

00:57:18.305 --> 00:57:19.605 between industry led,

NOTE Confidence: 0.9987186

00:57:20.145 --> 00:57:20.645 registries

NOTE Confidence: 0.86097604

00:57:21.345 --> 00:57:23.205 and industry led studies

NOTE Confidence: 0.9980516

00:57:23.600 --> 00:57:24.180 or trials

NOTE Confidence: 0.9013559

00:57:24.560 --> 00:57:26.080 and these other registries like

NOTE Confidence: 0.9013559

00:57:26.080 --> 00:57:27.840 the the shock working group,

NOTE Confidence: 0.9013559

00:57:27.840 --> 00:57:28.800 the c three t n.

NOTE Confidence: 0.9013559

00:57:28.800 --> 00:57:30.560 Those are almost charity on

NOTE Confidence: 0.9013559

00:57:30.560 --> 00:57:32.080 parts of the, of the

NOTE Confidence: 0.9013559

00:57:32.080 --> 00:57:33.920 investigators. There's they're they're very

NOTE Confidence: 0.9013559

00:57:33.920 --> 00:57:34.420 underfunded.

NOTE Confidence: 0.9881859

00:57:35.200 --> 00:57:36.560 They have huge amounts of

NOTE Confidence: 0.9881859

00:57:36.560 --> 00:57:37.760 missing data and they're not

NOTE Confidence: 0.9881859

00:57:37.760 --> 00:57:39.305 useful. So that's the number

NOTE Confidence: 0.9881859

00:57:39.305 --> 00:57:40.265 one thing that we're gonna

NOTE Confidence: 0.9881859

00:57:40.265 --> 00:57:41.085 try to

NOTE Confidence: 0.90048313

00:57:41.704 --> 00:57:43.464 to overcome by getting sufficient

NOTE Confidence: 0.90048313

00:57:43.464 --> 00:57:43.964 funding

NOTE Confidence: 0.90979856

00:57:44.265 --> 00:57:45.865 to to reimburse sites to

NOTE Confidence: 0.90979856

00:57:45.865 --> 00:57:47.545 collect the right the proper

NOTE Confidence: 0.90979856

00:57:47.545 --> 00:57:48.045 data.

NOTE Confidence: 0.92642725

00:57:48.505 --> 00:57:49.464 We need to you know

NOTE Confidence: 0.92642725

00:57:49.464 --> 00:57:51.625 we're we're developing inclusion exclusion

NOTE Confidence: 0.92642725

00:57:51.625 --> 00:57:52.924 criteria that parallel

NOTE Confidence: 0.9800176

00:57:53.305 --> 00:57:55.410 what what they would, be

NOTE Confidence: 0.9800176

00:57:55.470 --> 00:57:55.970 required

NOTE Confidence: 0.9851155

00:57:56.350 --> 00:57:57.550 in a, in a in

NOTE Confidence: 0.9851155

00:57:57.550 --> 00:57:58.930 a regulatory trial.

NOTE Confidence: 0.9873662

00:57:59.230 --> 00:58:00.430 We're gonna use case report

NOTE Confidence: 0.9873662

00:58:00.430 --> 00:58:02.830 forms, electronic medical records, and

NOTE Confidence: 0.9873662

00:58:02.830 --> 00:58:04.510 we're also collaborating closely with

NOTE Confidence: 0.9873662

00:58:04.510 --> 00:58:05.170 the FDA

NOTE Confidence: 0.9958354

00:58:05.790 --> 00:58:06.690 to prospectively

NOTE Confidence: 0.8324802

00:58:07.150 --> 00:58:08.290 define statistical,

NOTE Confidence: 0.9944455

00:58:09.405 --> 00:58:10.785 approaches that will allow

NOTE Confidence: 0.97725546

00:58:11.165 --> 00:58:12.765 using these two databases to

NOTE Confidence: 0.97725546

00:58:12.765 --> 00:58:14.125 be, to be used. And

NOTE Confidence: 0.97725546

00:58:14.125 --> 00:58:14.945 there are various

NOTE Confidence: 0.9103694

00:58:15.245 --> 00:58:17.425 statistical approaches of propensity matching,

NOTE Confidence: 0.912765

00:58:18.045 --> 00:58:20.065 and and Bayesian approaches,

NOTE Confidence: 0.9636342

00:58:20.925 --> 00:58:22.685 that we're working with, you

NOTE Confidence: 0.9636342

00:58:22.685 --> 00:58:23.720 know, with statisticians,

NOTE Confidence: 0.9920655

00:58:25.460 --> 00:58:26.660 and working closely with the

NOTE Confidence: 0.9920655

00:58:26.660 --> 00:58:28.180 FDA on these, on these

NOTE Confidence: 0.9920655

00:58:28.180 --> 00:58:28.680 efforts.

NOTE Confidence: 0.95802665

00:58:29.859 --> 00:58:30.359 So,

NOTE Confidence: 0.984879

00:58:31.220 --> 00:58:32.580 can't believe that I fit

NOTE Confidence: 0.984879

00:58:32.580 --> 00:58:34.180 in a hundred slides in

NOTE Confidence: 0.984879

00:58:34.180 --> 00:58:35.480 less than fifty minutes.

NOTE Confidence: 0.8067464

00:58:36.100 --> 00:58:36.420 And,

NOTE Confidence: 0.99597555

00:58:37.715 --> 00:58:38.535 just wanna emphasize

NOTE Confidence: 0.9378943

00:58:39.155 --> 00:58:40.115 one more thing. This is

NOTE Confidence: 0.9378943

00:58:40.115 --> 00:58:41.395 from, again, from the Schacht

NOTE Confidence: 0.9378943

00:58:41.395 --> 00:58:43.155 working group, the issue of

NOTE Confidence: 0.9378943

00:58:43.155 --> 00:58:43.655 time.

NOTE Confidence: 0.9410573

00:58:44.115 --> 00:58:46.135 So what really what happens,

NOTE Confidence: 0.9100893

00:58:47.075 --> 00:58:48.615 the course of the patient,

NOTE Confidence: 0.976711

00:58:50.195 --> 00:58:51.075 if you just look at

NOTE Confidence: 0.976711

00:58:51.075 --> 00:58:51.475 these,

NOTE Confidence: 0.8248652

00:58:52.275 --> 00:58:52.775 plots,

NOTE Confidence: 0.9857355

00:58:53.610 --> 00:58:54.570 a lot of most of

NOTE Confidence: 0.9857355

00:58:54.570 --> 00:58:55.930 the action is is very

NOTE Confidence: 0.9857355

00:58:55.930 --> 00:58:57.390 early, the first six hours.

NOTE Confidence: 0.98568696

00:58:59.130 --> 00:59:00.570 And after the first six

NOTE Confidence: 0.98568696

00:59:00.570 --> 00:59:01.610 hours, the course I mean,

NOTE Confidence: 0.98568696

00:59:01.610 --> 00:59:02.250 there are there are, you

NOTE Confidence: 0.98568696

00:59:02.250 --> 00:59:03.450 know, there are some movement

NOTE Confidence: 0.98568696

00:59:03.450 --> 00:59:03.950 between

NOTE Confidence: 0.96361345

00:59:04.330 --> 00:59:04.810 between,

NOTE Confidence: 0.9535747

00:59:05.610 --> 00:59:07.125 stages here. And this is

NOTE Confidence: 0.9535747

00:59:07.285 --> 00:59:08.565 these are the sky stages

NOTE Confidence: 0.9535747

00:59:08.565 --> 00:59:09.605 and these are the phenotypes

NOTE Confidence: 0.9535747

00:59:09.605 --> 00:59:10.325 that I showed you at

NOTE Confidence: 0.9535747

00:59:10.325 --> 00:59:10.905 the beginning.

NOTE Confidence: 0.9959684

00:59:11.365 --> 00:59:12.565 But most of it is

NOTE Confidence: 0.9959684

00:59:12.565 --> 00:59:13.465 really determined,

NOTE Confidence: 0.995262

00:59:14.085 --> 00:59:15.285 at the from the first

NOTE Confidence: 0.995262

00:59:15.285 --> 00:59:16.025 six hours.

NOTE Confidence: 0.995348

00:59:16.485 --> 00:59:18.025 So time is important.

NOTE Confidence: 0.9896661

00:59:18.485 --> 00:59:19.225 This really,

NOTE Confidence: 0.99964905

00:59:19.605 --> 00:59:20.905 feeds heavily into

NOTE Confidence: 0.9703754

00:59:21.560 --> 00:59:22.940 especially when you're developing,

NOTE Confidence: 0.9789278

00:59:23.480 --> 00:59:25.420 algorithms for systems of care

NOTE Confidence: 0.9789278

00:59:25.560 --> 00:59:26.600 and how you deal with

NOTE Confidence: 0.9789278

00:59:26.600 --> 00:59:27.100 patients,

NOTE Confidence: 0.8547504

00:59:27.640 --> 00:59:28.140 transfer,

NOTE Confidence: 0.9984011

00:59:29.160 --> 00:59:31.320 and and resource allocation at

NOTE Confidence: 0.9984011

00:59:31.320 --> 00:59:32.460 the peripheral sites.

NOTE Confidence: 0.9854833

00:59:33.400 --> 00:59:33.900 So

NOTE Confidence: 0.9775303

00:59:34.395 --> 00:59:35.275 and then I'll just leave

NOTE Confidence: 0.9775303

00:59:35.275 --> 00:59:36.955 you with this, this one

NOTE Confidence: 0.9775303

00:59:36.955 --> 00:59:38.395 image here of the the

NOTE Confidence: 0.9775303

00:59:38.395 --> 00:59:39.775 shock working group app,

NOTE Confidence: 0.99925464

00:59:40.075 --> 00:59:41.035 which has a lot of

NOTE Confidence: 0.99925464

00:59:41.035 --> 00:59:41.535 resources

NOTE Confidence: 0.9805372

00:59:41.995 --> 00:59:42.495 about,

NOTE Confidence: 0.9237024

00:59:43.035 --> 00:59:44.555 you know, staging, helping to

NOTE Confidence: 0.9237024

00:59:44.555 --> 00:59:46.315 stage and phenotype patients giving

NOTE Confidence: 0.9237024

00:59:46.315 --> 00:59:47.455 prognostic information.

NOTE Confidence: 0.96053225

00:59:48.410 --> 00:59:49.930 We have the congestion profile

NOTE Confidence: 0.96053225

00:59:49.930 --> 00:59:51.050 tracker which allows you to

NOTE Confidence: 0.96053225

00:59:51.050 --> 00:59:52.090 track a patient where they

NOTE Confidence: 0.96053225

00:59:52.090 --> 00:59:53.070 are in their CVP

NOTE Confidence: 0.4582231

00:59:53.530 --> 00:59:54.030 wedge

NOTE Confidence: 0.8497777

00:59:54.330 --> 00:59:54.830 profile.

NOTE Confidence: 0.9858294

00:59:56.010 --> 00:59:56.510 And

NOTE Confidence: 0.92382824

00:59:57.050 --> 00:59:58.730 this is a it's been

NOTE Confidence: 0.92382824

00:59:58.730 --> 01:00:00.970 helpful especially when sites are

NOTE Confidence: 0.92382824

01:00:00.970 --> 01:00:02.510 just initiating their

NOTE Confidence: 0.7783327

01:00:02.890 --> 01:00:03.550 their programs.

NOTE Confidence: 0.9455156

01:00:04.275 --> 01:00:05.395 So with that, I covered

NOTE Confidence: 0.9455156

01:00:05.395 --> 01:00:06.275 a a huge amount of

NOTE Confidence: 0.9455156

01:00:06.275 --> 01:00:06.775 ground.

NOTE Confidence: 0.97634745

01:00:07.474 --> 01:00:08.434 Didn't there's a lot that

NOTE Confidence: 0.97634745

01:00:08.434 --> 01:00:09.474 I didn't cover, of course.

NOTE Confidence: 0.97634745

01:00:09.474 --> 01:00:10.595 It's a huge field right

NOTE Confidence: 0.97634745

01:00:10.595 --> 01:00:11.474 now. A lot of lot

NOTE Confidence: 0.97634745

01:00:11.474 --> 01:00:12.994 of things happening and a

NOTE Confidence: 0.97634745

01:00:12.994 --> 01:00:14.595 lot of opportunities to, to

NOTE Confidence: 0.97634745

01:00:14.595 --> 01:00:15.954 be involved with advancing the

NOTE Confidence: 0.97634745

01:00:15.954 --> 01:00:17.015 field. Thank you.

NOTE Confidence: 0.9863882

01:00:25.450 --> 01:00:25.950 So,

NOTE Confidence: 0.9750626

01:00:27.050 --> 01:00:28.090 as I walk up to

NOTE Confidence: 0.9750626

01:00:28.090 --> 01:00:29.070 give the mic,

NOTE Confidence: 0.9317144

01:00:29.450 --> 01:00:30.250 quick question.

NOTE Confidence: 0.9485423

01:00:30.570 --> 01:00:31.710 You know, it really was,

NOTE Confidence: 0.96005005

01:00:32.214 --> 01:00:33.494 first of all, fantastic talk,

NOTE Confidence: 0.96005005

01:00:33.494 --> 01:00:34.375 and thank you and a

NOTE Confidence: 0.96005005

01:00:34.375 --> 01:00:35.755 wonderful way to celebrate

NOTE Confidence: 0.95962065

01:00:36.135 --> 01:00:37.734 Woody's achievements in in in

NOTE Confidence: 0.95962065

01:00:37.734 --> 01:00:38.395 our program.

NOTE Confidence: 0.9860742

01:00:39.015 --> 01:00:40.295 I I guess I wanted

NOTE Confidence: 0.9860742

01:00:40.295 --> 01:00:41.355 to ask you around

NOTE Confidence: 0.9205576

01:00:41.974 --> 01:00:44.135 this concept of the of,

NOTE Confidence: 0.9997748

01:00:44.855 --> 01:00:46.075 not leaving the lab

NOTE Confidence: 0.968764

01:00:46.780 --> 01:00:48.400 until you have a hemodynamic

NOTE Confidence: 0.968764

01:00:48.620 --> 01:00:49.920 target that's been met.

NOTE Confidence: 0.9945556

01:00:50.620 --> 01:00:51.120 And

NOTE Confidence: 0.99899644

01:00:51.420 --> 01:00:53.100 in that process, do we

NOTE Confidence: 0.99899644

01:00:53.100 --> 01:00:55.360 know whether we can predict

NOTE Confidence: 0.999032

01:00:56.300 --> 01:00:57.900 those individuals that are going

NOTE Confidence: 0.999032

01:00:57.900 --> 01:00:58.640 to fail

NOTE Confidence: 0.9561124

01:00:59.885 --> 01:01:01.325 CP and go to five

NOTE Confidence: 0.9561124

01:01:01.325 --> 01:01:03.005 point five quicker? Because we

NOTE Confidence: 0.9561124

01:01:03.005 --> 01:01:04.365 are seeing within our own

NOTE Confidence: 0.9561124

01:01:04.365 --> 01:01:04.865 organization

NOTE Confidence: 0.94158787

01:01:05.405 --> 01:01:06.765 a rapid increase in five

NOTE Confidence: 0.94158787

01:01:06.765 --> 01:01:07.505 five use.

NOTE Confidence: 0.9164935

01:01:07.885 --> 01:01:09.085 And and I'm just curious

NOTE Confidence: 0.9164935

01:01:09.085 --> 01:01:11.025 if you if anyone's evaluated

NOTE Confidence: 0.9164935

01:01:11.244 --> 01:01:12.125 that yet or you have

NOTE Confidence: 0.9164935

01:01:12.125 --> 01:01:13.805 any thoughts about what could

NOTE Confidence: 0.9164935

01:01:13.805 --> 01:01:14.464 be predictors.

NOTE Confidence: 0.99008703

01:01:14.765 --> 01:01:15.000 Yeah.

NOTE Confidence: 0.95423466

01:01:16.200 --> 01:01:18.220 So the five five use,

NOTE Confidence: 0.95423466

01:01:18.360 --> 01:01:19.880 what what I see is

NOTE Confidence: 0.95423466

01:01:19.880 --> 01:01:20.380 is

NOTE Confidence: 0.9819477

01:01:20.840 --> 01:01:22.440 is largely in the heart

NOTE Confidence: 0.9819477

01:01:22.440 --> 01:01:24.280 failure community as opposed to,

NOTE Confidence: 0.9819477

01:01:24.280 --> 01:01:25.420 let's say, the AMI.

NOTE Confidence: 0.99467385

01:01:27.080 --> 01:01:28.680 And, those tend to be

NOTE Confidence: 0.99467385

01:01:28.680 --> 01:01:29.420 more elective,

NOTE Confidence: 0.80658704

01:01:30.435 --> 01:01:32.355 not as urgent. Oh, wow.

NOTE Confidence: 0.80658704

01:01:32.355 --> 01:01:32.855 And,

NOTE Confidence: 0.6254697

01:01:33.555 --> 01:01:34.055 that's,

NOTE Confidence: 0.98403835

01:01:34.835 --> 01:01:35.415 at least

NOTE Confidence: 0.73716414

01:01:35.715 --> 01:01:37.235 at Columbia This morning during

NOTE Confidence: 0.73716414

01:01:37.235 --> 01:01:38.755 the COVID station, we bought

NOTE Confidence: 0.73716414

01:01:38.755 --> 01:01:40.055 a house and

NOTE Confidence: 0.88400835

01:01:40.435 --> 01:01:41.655 our heating went down.

NOTE Confidence: 0.87467116

01:01:42.355 --> 01:01:43.715 Okay. Hot water and and

NOTE Confidence: 0.87467116

01:01:43.715 --> 01:01:44.215 heating.

NOTE Confidence: 0.9635833

01:01:45.030 --> 01:01:46.810 The AMI patients tend to

NOTE Confidence: 0.9635833

01:01:46.950 --> 01:01:48.390 tend to be treated obviously

NOTE Confidence: 0.9635833

01:01:48.390 --> 01:01:49.430 in the lab, and that's

NOTE Confidence: 0.9635833

01:01:49.430 --> 01:01:50.470 really where this don't leave

NOTE Confidence: 0.9635833

01:01:50.470 --> 01:01:52.330 the lab until you're moving.

NOTE Confidence: 0.9635833

01:01:52.390 --> 01:01:53.990 I shouldn't maybe say reach

NOTE Confidence: 0.9635833

01:01:53.990 --> 01:01:55.270 the target, but moving towards

NOTE Confidence: 0.9635833

01:01:55.270 --> 01:01:56.070 the target that you see

NOTE Confidence: 0.9635833

01:01:56.070 --> 01:01:57.130 that there is a benefit.

NOTE Confidence: 0.9635833

01:01:57.270 --> 01:01:58.230 We don't know. There is

NOTE Confidence: 0.9635833

01:01:58.230 --> 01:01:59.904 no way right now to,

NOTE Confidence: 0.9635833

01:02:00.384 --> 01:02:01.744 to predict who's gonna need

NOTE Confidence: 0.9635833

01:02:01.744 --> 01:02:02.244 escalation.

NOTE Confidence: 0.99633837

01:02:03.505 --> 01:02:04.005 But,

NOTE Confidence: 0.99514735

01:02:04.865 --> 01:02:05.904 you know, if they leave

NOTE Confidence: 0.99514735

01:02:05.904 --> 01:02:07.505 the lab successfully, who's gonna

NOTE Confidence: 0.99514735

01:02:07.505 --> 01:02:08.944 need escalation later? We don't

NOTE Confidence: 0.99514735

01:02:08.944 --> 01:02:09.984 really have an index of

NOTE Confidence: 0.99514735

01:02:09.984 --> 01:02:11.424 that. People have looked at

NOTE Confidence: 0.99514735

01:02:11.424 --> 01:02:12.704 things like the cardiac output

NOTE Confidence: 0.99514735

01:02:12.704 --> 01:02:14.244 deficit. So you calculate

NOTE Confidence: 0.96781284

01:02:14.890 --> 01:02:15.450 you you look at the

NOTE Confidence: 0.96781284

01:02:15.450 --> 01:02:16.430 cardiac output.

NOTE Confidence: 0.9623368

01:02:16.730 --> 01:02:18.250 You say, you know, you

NOTE Confidence: 0.9623368

01:02:18.250 --> 01:02:19.609 say the patient needs a

NOTE Confidence: 0.9623368

01:02:19.609 --> 01:02:20.890 cardiac index of two point

NOTE Confidence: 0.9623368

01:02:20.890 --> 01:02:22.010 five, and then you subtract,

NOTE Confidence: 0.9623368

01:02:22.010 --> 01:02:22.890 and you say, okay. I

NOTE Confidence: 0.9623368

01:02:22.890 --> 01:02:24.330 need this many liters a

NOTE Confidence: 0.9623368

01:02:24.330 --> 01:02:26.010 minute. So that would that's

NOTE Confidence: 0.9623368

01:02:26.010 --> 01:02:26.670 one way

NOTE Confidence: 0.9824606

01:02:26.975 --> 01:02:28.015 that people have tried to

NOTE Confidence: 0.9824606

01:02:28.015 --> 01:02:28.975 look at, but it hasn't

NOTE Confidence: 0.9824606

01:02:28.975 --> 01:02:30.735 been very, hasn't been very

NOTE Confidence: 0.9824606

01:02:30.735 --> 01:02:31.955 helpful, has not proliferated.

NOTE Confidence: 0.98291963

01:02:34.015 --> 01:02:35.535 But, really, the main the

NOTE Confidence: 0.98291963

01:02:35.535 --> 01:02:37.215 main escalation in the lab

NOTE Confidence: 0.98291963

01:02:37.215 --> 01:02:38.755 is either from a CP

NOTE Confidence: 0.9506351

01:02:39.135 --> 01:02:40.255 to a CP plus an

NOTE Confidence: 0.9506351

01:02:40.255 --> 01:02:41.635 RP, so that CVP

NOTE Confidence: 0.9337173

01:02:42.360 --> 01:02:44.040 monitoring that or to a

NOTE Confidence: 0.9337173

01:02:44.200 --> 01:02:45.400 from a CP to a

NOTE Confidence: 0.9337173

01:02:45.400 --> 01:02:46.860 CP plus ECMA.

NOTE Confidence: 0.99756193

01:02:47.160 --> 01:02:48.280 Those are the usual in

NOTE Confidence: 0.99756193

01:02:48.280 --> 01:02:48.860 the lab.

NOTE Confidence: 0.98232824

01:02:50.920 --> 01:02:51.900 Thanks so much.

NOTE Confidence: 0.97178763

01:02:52.840 --> 01:02:54.220 You know, as an interventionalist,

NOTE Confidence: 0.97178763

01:02:54.520 --> 01:02:55.635 I think, or even as

NOTE Confidence: 0.97178763

01:02:55.635 --> 01:02:57.075 physicians, right, the do no

NOTE Confidence: 0.97178763

01:02:57.075 --> 01:02:59.075 harm versus benefit. And, obviously,

NOTE Confidence: 0.97178763

01:02:59.075 --> 01:02:59.795 you know, I think we

NOTE Confidence: 0.97178763

01:02:59.795 --> 01:03:01.235 will address a lot of

NOTE Confidence: 0.97178763

01:03:01.235 --> 01:03:02.595 those when you get to

NOTE Confidence: 0.97178763

01:03:02.595 --> 01:03:04.035 smaller devices. Right? A lot

NOTE Confidence: 0.97178763

01:03:04.035 --> 01:03:04.835 of the harm is due

NOTE Confidence: 0.97178763

01:03:04.835 --> 01:03:06.435 to vascular injuries or stroke

NOTE Confidence: 0.97178763

01:03:06.435 --> 01:03:07.875 or other things. I think

NOTE Confidence: 0.97178763

01:03:07.875 --> 01:03:09.635 that the challenge that that

NOTE Confidence: 0.97178763

01:03:09.635 --> 01:03:10.870 we face a little the

NOTE Confidence: 0.97178763

01:03:10.990 --> 01:03:11.950 a little bit or when

NOTE Confidence: 0.97178763

01:03:11.950 --> 01:03:13.310 I look at what the

NOTE Confidence: 0.97178763

01:03:13.310 --> 01:03:13.810 recommendations

NOTE Confidence: 0.99970955

01:03:14.350 --> 01:03:14.850 are

NOTE Confidence: 0.94665504

01:03:15.150 --> 01:03:16.450 is is the evidence

NOTE Confidence: 0.9996463

01:03:16.910 --> 01:03:17.410 for

NOTE Confidence: 0.9431587

01:03:19.150 --> 01:03:20.370 putting a large

NOTE Confidence: 0.9999256

01:03:20.910 --> 01:03:21.410 device

NOTE Confidence: 0.9998102

01:03:21.710 --> 01:03:23.090 in the femoral artery

NOTE Confidence: 0.99809676

01:03:23.470 --> 01:03:25.245 before you've even opened up

NOTE Confidence: 0.99809676

01:03:25.405 --> 01:03:26.225 the coronary.

NOTE Confidence: 0.98124623

01:03:26.605 --> 01:03:27.405 We know you know, I

NOTE Confidence: 0.98124623

01:03:27.405 --> 01:03:28.365 can tell you in our

NOTE Confidence: 0.98124623

01:03:28.365 --> 01:03:29.885 lab, it takes much longer

NOTE Confidence: 0.98124623

01:03:29.885 --> 01:03:31.265 to put in an impeller

NOTE Confidence: 0.98124623

01:03:31.325 --> 01:03:32.365 than it does to open

NOTE Confidence: 0.98124623

01:03:32.365 --> 01:03:33.405 up a coronary. And we

NOTE Confidence: 0.98124623

01:03:33.405 --> 01:03:35.645 also clearly have good evidence

NOTE Confidence: 0.98124623

01:03:35.645 --> 01:03:36.765 that, you know, the quicker

NOTE Confidence: 0.98124623

01:03:36.765 --> 01:03:37.825 you open up the coronary,

NOTE Confidence: 0.98124623

01:03:37.885 --> 01:03:39.245 it's beneficial. If you go

NOTE Confidence: 0.98124623

01:03:39.245 --> 01:03:40.545 radial, it's beneficial.

NOTE Confidence: 0.9981541

01:03:41.220 --> 01:03:43.320 And I've struggled to find

NOTE Confidence: 0.9981541

01:03:43.460 --> 01:03:45.619 sort of good data that

NOTE Confidence: 0.9981541

01:03:45.619 --> 01:03:46.359 has said

NOTE Confidence: 0.9120741

01:03:46.980 --> 01:03:47.880 it is clearly

NOTE Confidence: 0.9977271

01:03:48.180 --> 01:03:50.119 better to go

NOTE Confidence: 0.52390933

01:03:50.580 --> 01:03:51.080 upfront

NOTE Confidence: 0.9385324

01:03:51.619 --> 01:03:52.740 and put this in and,

NOTE Confidence: 0.9385324

01:03:52.740 --> 01:03:53.645 you know, we you you

NOTE Confidence: 0.9385324

01:03:53.645 --> 01:03:55.005 know, your patient comes in

NOTE Confidence: 0.9385324

01:03:55.244 --> 01:03:57.185 Sure. Chest pain, ST elevations,

NOTE Confidence: 0.9385324

01:03:57.484 --> 01:03:57.984 arrests,

NOTE Confidence: 0.9655803

01:03:58.765 --> 01:04:00.685 gets gets shocked, is on

NOTE Confidence: 0.9655803

01:04:00.685 --> 01:04:01.885 some epi, comes up to

NOTE Confidence: 0.9655803

01:04:01.885 --> 01:04:03.165 the lab. My read of

NOTE Confidence: 0.9655803

01:04:03.165 --> 01:04:04.045 it is you should put

NOTE Confidence: 0.9655803

01:04:04.045 --> 01:04:06.365 an Impella in first of

NOTE Confidence: 0.9655803

01:04:06.365 --> 01:04:07.005 of a lot of what

NOTE Confidence: 0.9655803

01:04:07.005 --> 01:04:08.045 it is. But I can't

NOTE Confidence: 0.9655803

01:04:08.045 --> 01:04:09.780 find anything that said we've

NOTE Confidence: 0.9655803

01:04:09.780 --> 01:04:11.300 looked at just opening up

NOTE Confidence: 0.9655803

01:04:11.300 --> 01:04:13.240 this coronary, which will take

NOTE Confidence: 0.9655803

01:04:13.460 --> 01:04:14.900 five, ten minutes. And then

NOTE Confidence: 0.9655803

01:04:15.060 --> 01:04:16.260 Yeah. And then evaluating. And

NOTE Confidence: 0.9655803

01:04:16.260 --> 01:04:17.220 I'm and I'm that's where

NOTE Confidence: 0.9655803

01:04:17.220 --> 01:04:18.100 I think a lot of

NOTE Confidence: 0.9655803

01:04:18.100 --> 01:04:18.600 interventionalists

NOTE Confidence: 0.978648

01:04:19.620 --> 01:04:21.220 have the the challenge of

NOTE Confidence: 0.978648

01:04:21.220 --> 01:04:22.420 telling us to sort of

NOTE Confidence: 0.978648

01:04:22.420 --> 01:04:23.700 do that other piece different.

NOTE Confidence: 0.978648

01:04:23.700 --> 01:04:24.420 And I wonder if you

NOTE Confidence: 0.978648

01:04:24.420 --> 01:04:25.515 could help us there as

NOTE Confidence: 0.978648

01:04:25.515 --> 01:04:26.154 we work towards that. Yeah.

NOTE Confidence: 0.978648

01:04:26.154 --> 01:04:27.275 I don't think I don't

NOTE Confidence: 0.978648

01:04:27.434 --> 01:04:28.414 the the algorithms,

NOTE Confidence: 0.9994672

01:04:30.875 --> 01:04:31.375 are

NOTE Confidence: 0.99911314

01:04:31.994 --> 01:04:33.214 are less specific

NOTE Confidence: 0.86260086

01:04:33.595 --> 01:04:35.434 about Impella first or artery

NOTE Confidence: 0.86260086

01:04:35.434 --> 01:04:35.934 first.

NOTE Confidence: 0.9547255

01:04:36.315 --> 01:04:37.595 Obviously, we're gonna have the

NOTE Confidence: 0.9547255

01:04:37.595 --> 01:04:39.115 DTU, the door to unload

NOTE Confidence: 0.9547255

01:04:39.115 --> 01:04:40.315 is gonna be presented at

NOTE Confidence: 0.9547255

01:04:40.315 --> 01:04:40.815 ACC.

NOTE Confidence: 0.9574105

01:04:41.650 --> 01:04:43.010 So maybe that's it's a

NOTE Confidence: 0.9574105

01:04:43.010 --> 01:04:43.830 different population.

NOTE Confidence: 0.9537736

01:04:44.690 --> 01:04:46.150 It's, you know, who knows,

NOTE Confidence: 0.9854532

01:04:47.010 --> 01:04:48.130 what what that will show

NOTE Confidence: 0.9854532

01:04:48.130 --> 01:04:49.590 and and what its implications

NOTE Confidence: 0.9854532

01:04:49.810 --> 01:04:51.750 would be for, for cardiogenic

NOTE Confidence: 0.9854532

01:04:51.890 --> 01:04:52.390 shock.

NOTE Confidence: 0.9224886

01:04:53.650 --> 01:04:54.390 In danger,

NOTE Confidence: 0.9694495

01:04:54.765 --> 01:04:55.724 I don't know the numbers

NOTE Confidence: 0.9694495

01:04:55.724 --> 01:04:56.365 off the top of my

NOTE Confidence: 0.9694495

01:04:56.365 --> 01:04:57.325 head. There were a certain

NOTE Confidence: 0.9694495

01:04:57.325 --> 01:04:58.765 number of patients that were

NOTE Confidence: 0.9694495

01:04:58.765 --> 01:05:00.285 that were Impella was put

NOTE Confidence: 0.9694495

01:05:00.285 --> 01:05:01.484 in first, and there was

NOTE Confidence: 0.9694495

01:05:01.484 --> 01:05:03.005 a certain percentage that were

NOTE Confidence: 0.9694495

01:05:03.005 --> 01:05:03.805 where it,

NOTE Confidence: 0.9886525

01:05:04.525 --> 01:05:06.065 it, was put in after.

NOTE Confidence: 0.9992604

01:05:06.845 --> 01:05:07.505 I think

NOTE Confidence: 0.9911781

01:05:08.260 --> 01:05:09.380 if I I I really

NOTE Confidence: 0.9911781

01:05:09.380 --> 01:05:10.420 don't wanna misquote it, but

NOTE Confidence: 0.9911781

01:05:10.420 --> 01:05:11.780 I don't think the numbers

NOTE Confidence: 0.9911781

01:05:11.780 --> 01:05:12.660 are small, but I don't

NOTE Confidence: 0.9911781

01:05:12.660 --> 01:05:13.800 think there was a difference

NOTE Confidence: 0.9911781

01:05:14.020 --> 01:05:15.540 in the outcomes if it

NOTE Confidence: 0.9911781

01:05:15.540 --> 01:05:16.660 was put in before or

NOTE Confidence: 0.9911781

01:05:16.660 --> 01:05:17.160 after.

NOTE Confidence: 0.99557894

01:05:17.460 --> 01:05:19.060 That paper either is should

NOTE Confidence: 0.99557894

01:05:19.060 --> 01:05:20.565 be coming out or is

NOTE Confidence: 0.99557894

01:05:20.565 --> 01:05:21.525 out. I don't I don't

NOTE Confidence: 0.99557894

01:05:21.525 --> 01:05:22.964 remember that. Maybe someone else

NOTE Confidence: 0.99557894

01:05:23.125 --> 01:05:24.085 is it out already? I

NOTE Confidence: 0.99557894

01:05:24.085 --> 01:05:24.984 don't even know.

NOTE Confidence: 0.82467234

01:05:27.605 --> 01:05:28.105 Yeah.

NOTE Confidence: 0.82957387

01:05:29.285 --> 01:05:31.685 Similar. Disparison out. Yeah. And

NOTE Confidence: 0.82957387

01:05:31.685 --> 01:05:32.724 it didn't if you look

NOTE Confidence: 0.82957387

01:05:32.724 --> 01:05:33.925 at the forest plots in

NOTE Confidence: 0.82957387

01:05:33.925 --> 01:05:35.445 the, in the appendix, they

NOTE Confidence: 0.82957387

01:05:35.445 --> 01:05:37.100 they didn't matter. They formed

NOTE Confidence: 0.82957387

01:05:37.100 --> 01:05:37.920 the forest.

NOTE Confidence: 0.958947

01:05:41.900 --> 01:05:43.840 Yeah. Yeah. Also,

NOTE Confidence: 0.97223866

01:05:44.620 --> 01:05:45.580 I don't think if I'm

NOTE Confidence: 0.97223866

01:05:45.580 --> 01:05:47.180 not mistaken, correct me, if

NOTE Confidence: 0.97223866

01:05:47.180 --> 01:05:48.220 if you if you go

NOTE Confidence: 0.97223866

01:05:48.220 --> 01:05:49.260 below nine if you could

NOTE Confidence: 0.97223866

01:05:49.260 --> 01:05:50.460 get your artery open in

NOTE Confidence: 0.97223866

01:05:50.460 --> 01:05:51.744 less than ninety minutes, that

NOTE Confidence: 0.97223866

01:05:51.744 --> 01:05:53.505 doesn't matter either. So ninety

NOTE Confidence: 0.97223866

01:05:53.505 --> 01:05:54.545 minutes, you know, was that

NOTE Confidence: 0.97223866

01:05:54.545 --> 01:05:56.145 cutoff that was established, like,

NOTE Confidence: 0.97223866

01:05:56.145 --> 01:05:57.445 ten years ago or whatever.

NOTE Confidence: 0.97223866

01:05:57.744 --> 01:05:59.025 And all the data show

NOTE Confidence: 0.97223866

01:05:59.025 --> 01:06:00.065 it doesn't matter if it's

NOTE Confidence: 0.97223866

01:06:00.065 --> 01:06:01.345 sixty minutes or ninety minutes,

NOTE Confidence: 0.97223866

01:06:01.345 --> 01:06:02.565 didn't really make a difference.

NOTE Confidence: 0.97223866

01:06:02.705 --> 01:06:04.224 So it's not the that

NOTE Confidence: 0.97223866

01:06:04.224 --> 01:06:05.765 that delay doesn't really,

NOTE Confidence: 0.99927425

01:06:07.029 --> 01:06:08.089 you know,

NOTE Confidence: 0.9612048

01:06:08.710 --> 01:06:09.769 concern me. Also,

NOTE Confidence: 0.9814632

01:06:10.069 --> 01:06:10.830 the other thing that I've

NOTE Confidence: 0.9814632

01:06:10.950 --> 01:06:11.829 that I think that these

NOTE Confidence: 0.9814632

01:06:11.829 --> 01:06:12.950 are a little bit anecdotal,

NOTE Confidence: 0.9814632

01:06:12.950 --> 01:06:13.670 but I think if you

NOTE Confidence: 0.9814632

01:06:13.670 --> 01:06:14.549 have a patient with, like,

NOTE Confidence: 0.9814632

01:06:14.549 --> 01:06:15.690 refractory VF,

NOTE Confidence: 0.99865633

01:06:15.990 --> 01:06:16.890 if they're unloaded,

NOTE Confidence: 0.9733799

01:06:17.430 --> 01:06:19.049 they seem that seems to

NOTE Confidence: 0.9733799

01:06:19.345 --> 01:06:20.965 reduce the the the fibrillation

NOTE Confidence: 0.9733799

01:06:21.185 --> 01:06:21.685 threshold.

NOTE Confidence: 0.97160107

01:06:21.985 --> 01:06:23.185 And that also makes a

NOTE Confidence: 0.97160107

01:06:23.185 --> 01:06:23.685 physiological

NOTE Confidence: 0.97126085

01:06:23.985 --> 01:06:25.185 sense, less stress on the

NOTE Confidence: 0.97126085

01:06:25.185 --> 01:06:25.685 myocardium

NOTE Confidence: 0.99343526

01:06:26.145 --> 01:06:27.025 that, you know, they can

NOTE Confidence: 0.99343526

01:06:27.025 --> 01:06:28.305 they can be defibrillated. So

NOTE Confidence: 0.99343526

01:06:28.305 --> 01:06:29.525 there's all sorts of scenarios.

NOTE Confidence: 0.9227803

01:06:30.785 --> 01:06:32.305 Dan, one last question. Perhaps

NOTE Confidence: 0.9227803

01:06:32.465 --> 01:06:34.100 maybe two last questions. Tara

NOTE Confidence: 0.9227803

01:06:34.100 --> 01:06:35.060 and then Al, then we'll

NOTE Confidence: 0.9227803

01:06:35.060 --> 01:06:35.780 close it up with the

NOTE Confidence: 0.9227803

01:06:35.780 --> 01:06:37.380 last time. Doctor. Bercow, thank

NOTE Confidence: 0.9227803

01:06:37.380 --> 01:06:38.740 you so much for excellent

NOTE Confidence: 0.9227803

01:06:38.740 --> 01:06:40.020 talk. I have two quick

NOTE Confidence: 0.9227803

01:06:40.020 --> 01:06:41.460 questions. So you had alluded

NOTE Confidence: 0.9227803

01:06:41.460 --> 01:06:42.520 to the fact that

NOTE Confidence: 0.97818536

01:06:42.980 --> 01:06:43.480 inotropes,

NOTE Confidence: 0.9879655

01:06:44.180 --> 01:06:46.360 they improve hemodynamics, but they

NOTE Confidence: 0.9879655

01:06:46.660 --> 01:06:48.440 increase myocardial oxygen

NOTE Confidence: 0.9541535

01:06:49.075 --> 01:06:49.575 demand.

NOTE Confidence: 0.9854383

01:06:50.355 --> 01:06:51.575 So should we be

NOTE Confidence: 0.9985607

01:06:52.515 --> 01:06:54.355 telling people to use less

NOTE Confidence: 0.9985607

01:06:54.355 --> 01:06:54.855 inotropes

NOTE Confidence: 0.95012826

01:06:55.635 --> 01:06:57.415 even if they're improving hemodynamics?

NOTE Confidence: 0.95654815

01:06:58.675 --> 01:07:00.455 And the second question is

NOTE Confidence: 0.95654815

01:07:00.595 --> 01:07:01.975 that why have inotropes

NOTE Confidence: 0.58298737

01:07:02.435 --> 01:07:02.935 like

NOTE Confidence: 0.92532045

01:07:03.250 --> 01:07:05.270 Omacamta, for example, that do

NOTE Confidence: 0.953366

01:07:05.650 --> 01:07:07.570 improve hemodynamics and they don't

NOTE Confidence: 0.953366

01:07:07.570 --> 01:07:08.050 have,

NOTE Confidence: 0.9706944

01:07:08.530 --> 01:07:09.670 you know, they don't really,

NOTE Confidence: 0.9706944

01:07:09.970 --> 01:07:11.330 as far as we've been

NOTE Confidence: 0.9706944

01:07:11.330 --> 01:07:13.590 told, increase oxygen requirement.

NOTE Confidence: 0.9805913

01:07:14.130 --> 01:07:15.270 Why have the clinical,

NOTE Confidence: 0.9651836

01:07:15.970 --> 01:07:17.810 outcome studies been so,

NOTE Confidence: 0.9927857

01:07:18.795 --> 01:07:19.295 disappointing?

NOTE Confidence: 0.96456397

01:07:22.075 --> 01:07:23.035 So two

NOTE Confidence: 0.995593

01:07:23.755 --> 01:07:25.434 should we should we I

NOTE Confidence: 0.995593

01:07:25.434 --> 01:07:26.895 think that from a physiological

NOTE Confidence: 0.995593

01:07:27.115 --> 01:07:27.615 perspective,

NOTE Confidence: 0.9668817

01:07:28.795 --> 01:07:30.315 you should reduce inotropes and

NOTE Confidence: 0.9668817

01:07:30.315 --> 01:07:31.515 pressors. I mean, think about

NOTE Confidence: 0.9668817

01:07:31.515 --> 01:07:32.015 AMI.

NOTE Confidence: 0.9399537

01:07:32.540 --> 01:07:33.980 Beta blockers are class one

NOTE Confidence: 0.9399537

01:07:33.980 --> 01:07:35.200 indication in AMI

NOTE Confidence: 0.85191745

01:07:35.500 --> 01:07:36.000 because

NOTE Confidence: 0.96814924

01:07:36.700 --> 01:07:38.300 they reduce infarct size, they

NOTE Confidence: 0.96814924

01:07:38.300 --> 01:07:39.900 reduce oxygen consumption, they reduce

NOTE Confidence: 0.96814924

01:07:39.900 --> 01:07:42.640 heart rate, they reduce mortality,

NOTE Confidence: 0.9876325

01:07:43.020 --> 01:07:43.680 they reduce,

NOTE Confidence: 0.9236358

01:07:44.540 --> 01:07:45.839 incident heart failure,

NOTE Confidence: 0.9857192

01:07:46.140 --> 01:07:46.960 beta blockers.

NOTE Confidence: 0.9683495

01:07:47.465 --> 01:07:48.505 So now we're talking about

NOTE Confidence: 0.9683495

01:07:48.505 --> 01:07:50.265 AMI, and we're we're doing

NOTE Confidence: 0.9683495

01:07:50.265 --> 01:07:51.385 AMI shock, and we're doing

NOTE Confidence: 0.9683495

01:07:51.385 --> 01:07:52.905 the opposite. We're doing so

NOTE Confidence: 0.9683495

01:07:52.905 --> 01:07:53.945 it does does not make

NOTE Confidence: 0.9683495

01:07:53.945 --> 01:07:55.385 sense to use inotropes in

NOTE Confidence: 0.9683495

01:07:55.385 --> 01:07:57.065 that setting. We know that

NOTE Confidence: 0.9683495

01:07:57.065 --> 01:07:59.085 inotropes increase in farc size.

NOTE Confidence: 0.9683495

01:07:59.305 --> 01:08:00.765 So it makes it makes

NOTE Confidence: 0.9954979

01:08:01.290 --> 01:08:02.590 indirect sense, let's

NOTE Confidence: 0.97338295

01:08:02.890 --> 01:08:03.770 say, that we we should

NOTE Confidence: 0.97338295

01:08:03.770 --> 01:08:05.050 not be using inotropes, but

NOTE Confidence: 0.97338295

01:08:05.050 --> 01:08:05.770 you have to. You have

NOTE Confidence: 0.97338295

01:08:05.770 --> 01:08:06.890 no choice. Right? Because you

NOTE Confidence: 0.97338295

01:08:06.970 --> 01:08:08.010 you've gotta get the blood

NOTE Confidence: 0.97338295

01:08:08.010 --> 01:08:09.130 pressure up until you have

NOTE Confidence: 0.97338295

01:08:09.130 --> 01:08:09.790 an alternative,

NOTE Confidence: 0.9472578

01:08:10.090 --> 01:08:11.710 which is what MCS mechanical

NOTE Confidence: 0.9472578

01:08:11.850 --> 01:08:13.210 support devices give you an

NOTE Confidence: 0.9472578

01:08:13.210 --> 01:08:13.710 alternative.

NOTE Confidence: 0.9992539

01:08:14.410 --> 01:08:15.450 So I think that is

NOTE Confidence: 0.9992539

01:08:15.450 --> 01:08:16.270 the right thing.

NOTE Confidence: 0.96863365

01:08:16.755 --> 01:08:18.695 Now why do inotropes increase,

NOTE Confidence: 0.99860746

01:08:19.235 --> 01:08:21.155 oxygen consumption? It's mainly because

NOTE Confidence: 0.99860746

01:08:21.155 --> 01:08:22.615 of their impact on calcium.

NOTE Confidence: 0.93782514

01:08:24.195 --> 01:08:25.575 It's the SR ATPase.

NOTE Confidence: 0.934399

01:08:26.915 --> 01:08:29.235 The way inotropes work is

NOTE Confidence: 0.934399

01:08:29.235 --> 01:08:31.015 number one, by increasing calcium,

NOTE Confidence: 0.99860984

01:08:31.440 --> 01:08:32.400 and that has to be

NOTE Confidence: 0.99860984

01:08:32.400 --> 01:08:33.600 sequestered by the,

NOTE Confidence: 0.90858316

01:08:34.240 --> 01:08:35.940 circuit two a, which ATP

NOTE Confidence: 0.90858316

01:08:36.080 --> 01:08:37.680 requirement. That's the major part.

NOTE Confidence: 0.90858316

01:08:37.680 --> 01:08:38.979 It's the there's additional

NOTE Confidence: 0.9833617

01:08:39.360 --> 01:08:40.320 work that is being done,

NOTE Confidence: 0.9833617

01:08:40.320 --> 01:08:41.280 but the main thing is

NOTE Confidence: 0.9833617

01:08:41.280 --> 01:08:43.200 really the the, the circuit

NOTE Confidence: 0.9833617

01:08:43.200 --> 01:08:44.445 two a. So if you

NOTE Confidence: 0.9833617

01:08:44.445 --> 01:08:45.645 have a a drug that

NOTE Confidence: 0.9833617

01:08:45.645 --> 01:08:47.585 does not increase that increases

NOTE Confidence: 0.9833617

01:08:47.645 --> 01:08:48.145 contractility

NOTE Confidence: 0.8906928

01:08:48.604 --> 01:08:49.505 without increasing,

NOTE Confidence: 0.9942354

01:08:50.764 --> 01:08:51.264 calcium,

NOTE Confidence: 0.95914704

01:08:51.724 --> 01:08:53.104 then that would be theoretically

NOTE Confidence: 0.95914704

01:08:53.244 --> 01:08:53.744 beneficial,

NOTE Confidence: 0.9992838

01:08:54.364 --> 01:08:55.324 but that has not been

NOTE Confidence: 0.9992838

01:08:55.324 --> 01:08:56.224 tested yet.

NOTE Confidence: 0.9463449

01:08:58.650 --> 01:09:00.489 So question. You showed just

NOTE Confidence: 0.9463449

01:09:00.489 --> 01:09:02.350 CVP is an important predictor

NOTE Confidence: 0.9463449

01:09:02.410 --> 01:09:03.530 of outcome, and then you

NOTE Confidence: 0.9463449

01:09:03.530 --> 01:09:05.470 talked about pressure volume loops

NOTE Confidence: 0.9463449

01:09:05.530 --> 01:09:07.370 looking at sort of work

NOTE Confidence: 0.9463449

01:09:07.370 --> 01:09:08.189 and demand.

NOTE Confidence: 0.9995292

01:09:08.729 --> 01:09:10.235 So how do you

NOTE Confidence: 0.9925894

01:09:10.614 --> 01:09:12.054 see pressure volume loops coming

NOTE Confidence: 0.9925894

01:09:12.054 --> 01:09:12.715 to play

NOTE Confidence: 0.9948986

01:09:13.255 --> 01:09:14.955 in the sort of adjustment

NOTE Confidence: 0.9948986

01:09:15.014 --> 01:09:15.755 or management

NOTE Confidence: 0.9991482

01:09:16.135 --> 01:09:16.875 of unloading?

NOTE Confidence: 0.98853225

01:09:18.935 --> 01:09:20.534 Well, I think I think

NOTE Confidence: 0.98853225

01:09:20.534 --> 01:09:22.375 that pressure volume loops can

NOTE Confidence: 0.98853225

01:09:22.375 --> 01:09:24.475 be helpful at the bedside.

NOTE Confidence: 0.8242954

01:09:25.080 --> 01:09:25.580 And,

NOTE Confidence: 0.99929065

01:09:27.800 --> 01:09:28.760 but there's a long way

NOTE Confidence: 0.99929065

01:09:28.760 --> 01:09:29.979 to go to get there.

NOTE Confidence: 0.98306036

01:09:30.360 --> 01:09:31.660 First, we have to develop

NOTE Confidence: 0.98306036

01:09:31.720 --> 01:09:33.080 techniques where we can actually

NOTE Confidence: 0.98306036

01:09:33.080 --> 01:09:34.360 display them at the bedside

NOTE Confidence: 0.98306036

01:09:34.360 --> 01:09:35.800 in the intensive care unit,

NOTE Confidence: 0.98306036

01:09:35.800 --> 01:09:36.840 and there are many people

NOTE Confidence: 0.98306036

01:09:36.840 --> 01:09:38.120 working on that. Paul here

NOTE Confidence: 0.98306036

01:09:38.200 --> 01:09:39.405 is here working on that.

NOTE Confidence: 0.98306036

01:09:39.405 --> 01:09:40.445 We're working on it, and

NOTE Confidence: 0.98306036

01:09:40.445 --> 01:09:41.244 there are other people that

NOTE Confidence: 0.98306036

01:09:41.244 --> 01:09:42.145 are working on that.

NOTE Confidence: 0.91976106

01:09:42.925 --> 01:09:43.804 The next thing that the

NOTE Confidence: 0.91976106

01:09:43.804 --> 01:09:44.925 next hurdle we have to

NOTE Confidence: 0.91976106

01:09:44.925 --> 01:09:46.064 overcome is education.

NOTE Confidence: 0.9668485

01:09:46.525 --> 01:09:48.204 So we don't teach we

NOTE Confidence: 0.9668485

01:09:48.204 --> 01:09:49.665 stop teaching physiology

NOTE Confidence: 0.8223301

01:09:50.045 --> 01:09:50.545 overall,

NOTE Confidence: 0.968704

01:09:51.050 --> 01:09:52.330 but in specific, we stop

NOTE Confidence: 0.968704

01:09:52.330 --> 01:09:53.610 teaching PV loops. We don't

NOTE Confidence: 0.968704

01:09:53.610 --> 01:09:54.490 teach them because they're not

NOTE Confidence: 0.968704

01:09:54.490 --> 01:09:55.229 used clinically,

NOTE Confidence: 0.96672934

01:09:55.530 --> 01:09:56.330 and we don't use them

NOTE Confidence: 0.96672934

01:09:56.330 --> 01:09:57.870 clinically because no one understands

NOTE Confidence: 0.96672934

01:09:57.930 --> 01:09:59.290 them. So we've gotta break

NOTE Confidence: 0.96672934

01:09:59.290 --> 01:09:59.950 that cycle.

NOTE Confidence: 0.99726474

01:10:00.570 --> 01:10:01.850 And I think that the

NOTE Confidence: 0.99726474

01:10:01.850 --> 01:10:03.150 efforts that we're doing,

NOTE Confidence: 0.95684445

01:10:03.610 --> 01:10:05.050 I hope, and all the

NOTE Confidence: 0.95684445

01:10:05.050 --> 01:10:06.765 papers we're writing, the efforts

NOTE Confidence: 0.95684445

01:10:06.765 --> 01:10:07.965 we're doing are are to

NOTE Confidence: 0.95684445

01:10:07.965 --> 01:10:08.465 reintroduce,

NOTE Confidence: 0.9390181

01:10:09.085 --> 01:10:10.525 this education into the the

NOTE Confidence: 0.9390181

01:10:10.525 --> 01:10:11.025 curriculum,

NOTE Confidence: 0.93938255

01:10:11.564 --> 01:10:12.845 hopefully, will go there. But

NOTE Confidence: 0.93938255

01:10:12.845 --> 01:10:14.125 I think what PV loops

NOTE Confidence: 0.93938255

01:10:14.125 --> 01:10:15.585 can do is, number one,

NOTE Confidence: 0.99937826

01:10:16.925 --> 01:10:18.365 in comparison to just looking

NOTE Confidence: 0.99937826

01:10:18.365 --> 01:10:19.104 at signals

NOTE Confidence: 0.9870992

01:10:19.890 --> 01:10:21.729 streaming across the screen, which

NOTE Confidence: 0.9870992

01:10:21.729 --> 01:10:22.390 are gone

NOTE Confidence: 0.84083545

01:10:22.770 --> 01:10:23.510 every thirty

NOTE Confidence: 0.93537074

01:10:23.969 --> 01:10:24.850 seconds, you can put a

NOTE Confidence: 0.93537074

01:10:24.850 --> 01:10:26.210 PV loop on the screen

NOTE Confidence: 0.93537074

01:10:26.210 --> 01:10:27.429 and it could stay there.

NOTE Confidence: 0.96027637

01:10:27.810 --> 01:10:28.689 You can see where you

NOTE Confidence: 0.96027637

01:10:28.689 --> 01:10:29.729 started. You could put a

NOTE Confidence: 0.96027637

01:10:29.729 --> 01:10:31.090 target, and you can see

NOTE Confidence: 0.96027637

01:10:31.090 --> 01:10:32.449 where you are compared to

NOTE Confidence: 0.96027637

01:10:32.449 --> 01:10:33.890 where you wanna be. It's

NOTE Confidence: 0.96027637

01:10:33.969 --> 01:10:35.064 it yet the p d

NOTE Confidence: 0.96027637

01:10:35.064 --> 01:10:36.505 loop, if you really understand

NOTE Confidence: 0.96027637

01:10:36.505 --> 01:10:38.365 it, has all the information

NOTE Confidence: 0.96027637

01:10:38.425 --> 01:10:39.545 from all the numbers that

NOTE Confidence: 0.96027637

01:10:39.545 --> 01:10:40.685 are that are around

NOTE Confidence: 0.97412586

01:10:41.064 --> 01:10:42.505 the the perimeter of the

NOTE Confidence: 0.97412586

01:10:42.585 --> 01:10:42.985 those,

NOTE Confidence: 0.9719102

01:10:43.545 --> 01:10:44.985 those, of those squiggles that

NOTE Confidence: 0.9719102

01:10:44.985 --> 01:10:46.025 are going across the the

NOTE Confidence: 0.9719102

01:10:46.025 --> 01:10:47.225 line. So we have a

NOTE Confidence: 0.9719102

01:10:47.225 --> 01:10:48.240 lot of work to do,

NOTE Confidence: 0.9985875

01:10:48.720 --> 01:10:49.840 but we're trying. I think

NOTE Confidence: 0.9985875

01:10:49.840 --> 01:10:50.980 many people are trying.