WEBVTT

00:00:02.600 --> 00:00:05.190 - Hello, good afternoon all

00:00:05.190 --> 00:00:08.250 and welcome to our sixth and final session

00:00:08.250 --> 00:00:11.460 of the 2020 virtual CleanMed series.

00:00:11.460 --> 00:00:14.670 Our session today is clinical sustainability,

00:00:14.670 --> 00:00:18.050 environmental stewardship at the bedside.

00:00:18.050 --> 00:00:20.420 And on behalf of Health Care Without Harm

00:00:20.420 --> 00:00:21.840 and Practice Greenhealth,

00:00:21.840 --> 00:00:24.400 we are very pleased to bring you this session

00:00:24.400 --> 00:00:26.360 in partnership with the Yale Center

00:00:26.360 --> 00:00:28.470 for Climate Change and Health.

00:00:28.470 --> 00:00:29.800 My name is Shanda Damaris,

00:00:29.800 --> 00:00:32.240 and I'm a Member Engagement Manager

00:00:32.240 --> 00:00:33.640 with Practice Greenhealth,

00:00:33.640 --> 00:00:36.530 as well as a cardiovascular nurse by background.

00:00:36.530 --> 00:00:39.310 And it is my pleasure today to be moderating this session

00:00:39.310 --> 00:00:41.600 for many, many folks across the country.

00:00:41.600 --> 00:00:43.040 So welcome.

00:00:43.040 --> 00:00:46.180 I also want to recognize my colleague, Dr. Amy Collins

00:00:46.180 --> 00:00:48.780 for her efforts in co-developing this session.

00:00:48.780 --> 00:00:50.180 So thank you for joining us.

00:00:53.100 --> 00:00:55.360 We would like to thank Kaiser Permanente

00:00:55.360 --> 00:00:58.060 for supporting our virtual series this year.

00:00:58.060 --> 00:01:00.090 And while of course, we're looking forward

00:01:00.090 --> 00:01:03.250 to future years when we can connect in-person,

00:01:03.250 --> 00:01:06.277 we do recognize the challenges that our communities,

00:01:06.277 --> 00:01:08.630 and of course our health professional audience

00:01:08.630 --> 00:01:11.030 in particular, is facing these days.

00:01:11.030 --> 00:01:13.560 And so that's why we are excited to let you know

00:01:13.560 --> 00:01:15.700 that CleanMed 2021,

00:01:15.700 --> 00:01:20.370 will be an even larger all-digital experience.

00:01:20.370 --> 00:01:23.030 So we'll share more details in the coming months.

00:01:23.030 --> 00:01:25.520 And we certainly look forward to your participation

00:01:25.520 --> 00:01:29.793 in a safe, exciting, and virtual CleanMed 2021.

00:01:32.367 --> 00:01:35.040 So a quick look at our agenda today.

00:01:35.040 --> 00:01:38.120 Just of note, the session will be recorded

00:01:38.120 --> 00:01:42.620 and it will be made available to attendees afterwards;

00:01:42.620 --> 00:01:46.350 in addition, all audience members are on mute.

00:01:46.350 --> 00:01:48.330 And so if you have questions

00:01:48.330 --> 00:01:50.730 or discussion you'd like to have during the session,

00:01:50.730 --> 00:01:54.220 please do feel encouraged to do that in the chat box.

00:01:54.220 --> 00:01:57.663 Myself and Dr. Amy Collins will be monitoring that together.

00:01:59.680 --> 00:02:03.960 So it is my pleasure to introduce our colleagues

00:02:03.960 --> 00:02:06.330 that will be on the line to say with us.

00:02:06.330 --> 00:02:08.930 First off will be Dr. Jodi Sherman;

00:02:08.930 --> 00:02:12.740 and Dr. Sherman is a Practicing Anesthesiologist

00:02:12.740 --> 00:02:15.170 and Medical Director of Sustainability

00:02:15.170 --> 00:02:17.750 at The Center for Sustainable Health Care,

00:02:17.750 --> 00:02:20.590 at Yale-New Haven Health System.

00:02:20.590 --> 00:02:22.980 She also holds among many other roles,

00:02:22.980 --> 00:02:24.770 the associate professor title

00:02:24.770 --> 00:02:27.833 at Yale School of Medicine and Public Health.

00:02:29.980 --> 00:02:33.090 Dr. Jonathan Slutzman will also be joining us today.

00:02:33.090 --> 00:02:34.220 And Dr. Slutzman

00:02:34.220 --> 00:02:37.480 is a Practicing Emergency Medicine Physician

00:02:37.480 --> 00:02:40.130 at Massachusetts General Hospital,

00:02:40.130 --> 00:02:42.930 and an instructor at Harvard Medical School.

00:02:42.930 --> 00:02:45.060 Dr. Slutzman has a diverse background

00:02:45.060 --> 00:02:47.490 in health care environmental research

00:02:47.490 --> 00:02:49.273 and environmental engineering.

00:02:51.200 --> 00:02:55.890 And joining us virtually today by prerecorded session,

00:02:55.890 --> 00:02:58.950 Dr. Cassandra Thiel, is an Assistant Professor

00:02:58.950 --> 00:03:03.050 at NYU Wagner Graduate School of Public Service.

00:03:03.050 --> 00:03:05.860 And she teaches in the department of population health

00:03:05.860 --> 00:03:10.680 and ophthalmology at NYU Grossman School of Medicine.

00:03:10.680 --> 00:03:12.820 So with that, I'm honored to hand this over

00:03:12.820 --> 00:03:15.023 to Dr. Jodi Sherman, who will kick us off.

00:03:26.890 --> 00:03:28.760 - Well thank you for inviting me

00:03:28.760 --> 00:03:31.070 to participate in the session.

00:03:31.070 --> 00:03:33.120 I am a practicing anesthesiologist

00:03:33.120 --> 00:03:35.000 and have been doing a lot of work

00:03:35.000 --> 00:03:36.850 in environmental health sector footprinting

00:03:36.850 --> 00:03:38.150 for the past decade.

00:03:38.150 --> 00:03:39.620 And we thought it'd be useful

00:03:39.620 --> 00:03:41.860 for me to start the presentation

00:03:41.860 --> 00:03:46.630 with a higher level view of emissions and drivers

00:03:46.630 --> 00:03:49.040 in health care sustainability.

00:03:49.040 --> 00:03:50.600 For disclosures, the Yale Program

00:03:50.600 --> 00:03:52.170 on Health care Environmental Sustainability,

00:03:52.170 --> 00:03:53.020 does receive funds

00:03:53.020 --> 00:03:56.437 from the Association for Medical Device Reprocessors.

00:03:57.870 --> 00:04:00.160 So why is sustainability in health care?

00:04:00.160 --> 00:04:02.490 Well, pollution is a leading cause of morbidity

00:04:02.490 --> 00:04:06.100 and mortality globally, responsible for 9 million

00:04:06.100 --> 00:04:09.260 or 16% of premature deaths annually.

00:04:09.260 --> 00:04:11.610 health care itself is a leading emitter

00:04:11.610 --> 00:04:13.290 of environmental emissions.

00:04:13.290 --> 00:04:14.650 And reducing health care pollution

00:04:14.650 --> 00:04:16.470 can improve the quadruple bottom line,

00:04:16.470 --> 00:04:20.510 meaning better care for the most people at the least cost,

00:04:20.510 --> 00:04:22.920 and to greatest staff satisfaction.

00:04:22.920 --> 00:04:24.810 And engaging health professionals,

00:04:24.810 --> 00:04:28.830 which are respected leaders in communities and globally

00:04:28.830 --> 00:04:31.640 around the issue of health care pollution prevention,

00:04:31.640 --> 00:04:34.340 can be key for societal transformation

00:04:34.340 --> 00:04:35.780 by affecting public policy

00:04:35.780 --> 00:04:38.530 and by touching all the patients that we interact with.

00:04:40.010 --> 00:04:41.210 So it's important to recognize

00:04:41.210 --> 00:04:44.110 that globally the health sector footprint is quite large.

00:04:44.110 --> 00:04:48.850 4.6% of global greenhouse gas emissions

00:04:48.850 --> 00:04:50.490 come from health care.

00:04:50.490 --> 00:04:54.077 That's an enormous quantity of emissions

00:04:54.077 --> 00:04:55.510 and a big responsibility,

00:04:55.510 --> 00:04:58.640 and when our commitment is to first do no harm.

00:04:58.640 --> 00:05:00.140 The U S health sector is an outlier,

00:05:00.140 --> 00:05:03.570 while only 4% of the global population,

00:05:03.570 --> 00:05:05.470 we are responsible for about 1/4

00:05:05.470 --> 00:05:09.440 of global health care greenhouse gas emissions.

00:05:09.440 --> 00:05:11.320 On the left, this is from the Lancet Commission

00:05:11.320 --> 00:05:14.940 on Climate Change and Health countdown angle report.

00:05:14.940 --> 00:05:19.550 We see that per capita health care greenhouse gas emissions,

00:05:19.550 --> 00:05:24.350 as a function of per capita GDP, the U S is an outlier.

00:05:24.350 --> 00:05:25.290 The bubble width

00:05:25.290 --> 00:05:30.290 represents a fraction of GDP spent on health care.

00:05:30.310 --> 00:05:32.240 So we spend more than twice as much in the U S

00:05:32.240 --> 00:05:35.070 on health care, but we do not have the best health outcomes

00:05:35.070 --> 00:05:36.650 for that investment.

00:05:36.650 --> 00:05:40.280 And if we look on the right, these are trends over time.

00:05:40.280 --> 00:05:42.540 This direction in health care is going globally,

00:05:42.540 --> 00:05:44.060 is not sustainable.

00:05:44.060 --> 00:05:46.490 We see one outlier here and that's Greece

00:05:46.490 --> 00:05:50.140 and this has to do with economic instability,

00:05:50.140 --> 00:05:53.580 and in part related to the Syrian refugee crisis

00:05:53.580 --> 00:05:58.350 which has very much challenged their health care system.

00:05:58.350 --> 00:06:01.420 And this is just to bring up an important point

00:06:01.420 --> 00:06:04.110 that we can reduce emissions by providing less care;

00:06:04.110 --> 00:06:06.603 that's not what we're at all suggesting.

00:06:07.940 --> 00:06:09.930 We need to improve access

00:06:09.930 --> 00:06:12.820 to basic and good quality care globally,

00:06:12.820 --> 00:06:14.683 and it has to be done sustainably.

00:06:15.690 --> 00:06:17.800 So delving deeper into the U S,

00:06:17.800 --> 00:06:20.780 the U S health care sector emits 9-10%

00:06:20.780 --> 00:06:23.040 of total national greenhouse gas emissions

00:06:23.040 --> 00:06:25.653 and similar fractions of criteria air pollution.

00:06:26.575 --> 00:06:30.920 So understanding what that means for public health,

00:06:30.920 --> 00:06:33.820 the public health damages from the U S health sector,

00:06:33.820 --> 00:06:37.680 around 614 disability adjusted life years lost annually.

00:06:37.680 --> 00:06:39.450 That's especially due to air pollution

00:06:39.450 --> 00:06:40.940 and also greenhouse gas emissions,

00:06:40.940 --> 00:06:43.410 but that's from total environmental emissions

00:06:43.410 --> 00:06:46.230 using life cycle assessment modeling.

00:06:46.230 --> 00:06:50.170 This amount of damages in the same order of magnitude,

00:06:50.170 --> 00:06:52.600 as the 44,000- 88,000 deaths

00:06:52.600 --> 00:06:55.738 due to medical errors first identified

00:06:55.738 --> 00:06:59.150 or quantified by the Institute of Medicine

00:06:59.150 --> 00:07:01.250 and their famous to err is human report

00:07:01.250 --> 00:07:03.260 that came out in 1999.

00:07:03.260 --> 00:07:07.000 This put patient safety on the map for health care.

00:07:07.000 --> 00:07:09.650 This completely transformed the lens

00:07:09.650 --> 00:07:11.710 through which we provide health care.

00:07:11.710 --> 00:07:14.720 It is all done through the lens of patient safety.

00:07:14.720 --> 00:07:16.670 On average, 10 years of life are lost

00:07:16.670 --> 00:07:18.470 for those medical error premature deaths.

00:07:18.470 --> 00:07:21.250 So that's why we're in the same order of magnitude.

00:07:21.250 --> 00:07:25.290 To this point, we've been ignoring the public health impacts

00:07:25.290 --> 00:07:27.030 of health care pollution.

00:07:27.030 --> 00:07:29.030 What we're saying is that pollution prevention

00:07:29.030 --> 00:07:30.810 is a new patient safety movement.

00:07:30.810 --> 00:07:33.870 This is just as important as protecting our patients

00:07:33.870 --> 00:07:35.270 from the care that we give,

00:07:35.270 --> 00:07:37.623 we also must protect public health.

00:07:39.240 --> 00:07:41.803 Delving in further the relative emissions

00:07:41.803 --> 00:07:44.690 that we're within health care those emissions come from;

00:07:44.690 --> 00:07:46.140 a lot of it comes from travel;

00:07:46.140 --> 00:07:48.330 both staff, patients, visitors.

00:07:48.330 --> 00:07:49.890 A lot of it comes from the energy

00:07:49.890 --> 00:07:54.740 that is required to run facilities.

00:07:54.740 --> 00:07:56.330 This is from the National Health Sector.

00:07:56.330 --> 00:07:58.170 If you're not, national health service,

00:07:58.170 --> 00:08:00.330 if you're not aware of the sustainable development unit

00:08:00.330 --> 00:08:03.410 out of England, do you are heavily encouraged

00:08:03.410 --> 00:08:06.150 to look at their reports.

00:08:06.150 --> 00:08:07.611 Importantly here a takeaway

00:08:07.611 --> 00:08:09.530 is that 2/3 of the health sector emissions

00:08:09.530 --> 00:08:11.090 are coming from procurement;

00:08:11.090 --> 00:08:13.630 and heavily coming from pharmaceuticals

00:08:13.630 --> 00:08:15.580 and other chemicals as whether,

00:08:15.580 --> 00:08:17.920 as well as consumable medical equipment.

00:08:17.920 --> 00:08:19.210 Numerous studies have shown

00:08:19.210 --> 00:08:23.480 more than 60% of health care's greenhouse gas emissions

00:08:23.480 --> 00:08:25.550 are coming from the supply chain;

00:08:25.550 --> 00:08:28.310 especially energy and upstream manufacturing.

00:08:28.310 --> 00:08:30.720 And so health care administrators and clinicians,

00:08:30.720 --> 00:08:33.540 we control which devices and which drugs

00:08:33.540 --> 00:08:35.210 and how many that we use.

00:08:35.210 --> 00:08:37.040 Whereas manufacturers and regulators

00:08:37.040 --> 00:08:39.507 really influence embedded emissions

00:08:39.507 --> 00:08:41.500 and what goes to marketplace.

00:08:41.500 --> 00:08:46.500 So we have different ways to leverage our voice.

00:08:47.940 --> 00:08:50.470 And specifically in health care, we have a problem,

00:08:50.470 --> 00:08:52.430 particularly in the U S;

00:08:52.430 --> 00:08:54.890 so this concept of a candy store culture,

00:08:54.890 --> 00:08:57.830 where all the resources with rare exception

00:08:57.830 --> 00:09:00.580 of things like expensive implant devices,

00:09:00.580 --> 00:09:01.670 everything seems free.

00:09:01.670 --> 00:09:03.830 So there's very little accountability to which

00:09:03.830 --> 00:09:04.920 and how much that we use.

00:09:04.920 --> 00:09:06.420 So this is a big part of the problem

00:09:06.420 --> 00:09:08.343 that we face in the United States.

00:09:09.290 --> 00:09:12.310 Another issue is infection control.

00:09:12.310 --> 00:09:14.130 Preventing infection is fundamental

00:09:14.130 --> 00:09:15.810 to everything that we do in health care.

00:09:15.810 --> 00:09:18.948 It is part of that safety, that patient safety lens

00:09:18.948 --> 00:09:22.990 that we view all our patient care through.

00:09:22.990 --> 00:09:25.010 It is fundamental to what we do.

00:09:25.010 --> 00:09:27.660 It is all our jobs to prevent infection.

00:09:27.660 --> 00:09:30.670 It costs our health system a lot.

00:09:30.670 --> 00:09:33.230 And when we have an additional care

00:09:33.230 --> 00:09:35.100 that is required to take care of patients

00:09:35.100 --> 00:09:37.040 who have health care acquired infections,

00:09:37.040 --> 00:09:38.410 that also increases costs

00:09:38.410 --> 00:09:40.790 as well as the pollution footprint.

00:09:40.790 --> 00:09:42.000 And of course it's the right thing

00:09:42.000 --> 00:09:43.880 to do to prevent infections.

00:09:43.880 --> 00:09:46.260 But the problem is that our efforts to prevent infections

00:09:46.260 --> 00:09:47.530 are driving this trend

00:09:47.530 --> 00:09:51.480 toward excessive single use disposable device uptake

00:09:51.480 --> 00:09:53.033 as well as drug waste.

00:09:53.890 --> 00:09:56.970 And so this is an important area that we need to address.

00:09:56.970 --> 00:09:58.800 Focusing on one type of infections,

00:09:58.800 --> 00:10:01.270 this is surgical site infections.

00:10:01.270 --> 00:10:02.620 Taking a historical view,

00:10:02.620 --> 00:10:04.970 if you were to go back a couple 100 years

00:10:04.970 --> 00:10:07.120 and you had a major surgery,

00:10:07.120 --> 00:10:10.960 you had about a 95% chance of getting an infection

00:10:10.960 --> 00:10:13.720 and maybe a 40% chance of survival.

00:10:13.720 --> 00:10:15.760 If we track the trends over time,

00:10:15.760 --> 00:10:18.310 we see the greatest change happening

00:10:18.310 --> 00:10:21.870 between 1860s, 1880, 1900.

00:10:21.870 --> 00:10:24.970 This happened along with some of Weiss and pastor

00:10:24.970 --> 00:10:28.420 and (indistinct) and Lewin Hook with germ theory,

00:10:28.420 --> 00:10:30.830 the microscope to actually prove the germs existed

00:10:30.830 --> 00:10:33.670 and then creating aseptic and antiseptic practices.

00:10:33.670 --> 00:10:35.710 So this was the greatest contribution

00:10:35.710 --> 00:10:39.120 to preventing infection and improving survivability

00:10:39.120 --> 00:10:42.520 in this case, after surgery.

00:10:42.520 --> 00:10:45.200 And then you see a slowing of the curve

00:10:45.200 --> 00:10:48.310 and another bump happening between 1930 and 1940.

00:10:48.310 --> 00:10:50.340 This was the introduction of antibiotics

00:10:50.340 --> 00:10:53.280 into our surgical protocols.

00:10:53.280 --> 00:10:55.480 And so that was the other great detriment.

00:10:55.480 --> 00:10:57.470 And then over time, you're seeing improvements

00:10:57.470 --> 00:11:00.160 in policies and procedures around our protocols

00:11:00.160 --> 00:11:05.160 for antibiosis and aseptic techniques.

00:11:05.240 --> 00:11:08.470 And so we are gradually approaching zero here.

00:11:08.470 --> 00:11:10.250 So we have less than a 5% chance

00:11:10.250 --> 00:11:12.030 of getting a surgical site infection,

00:11:12.030 --> 00:11:15.190 and a greater than 95% survival rate.

00:11:15.190 --> 00:11:17.840 So if we were to continue to look at this curve,

00:11:17.840 --> 00:11:19.970 we're asking tonically approaching zero.

00:11:19.970 --> 00:11:21.550 This is the infection rate,

00:11:21.550 --> 00:11:23.720 but what we're doing is we're trying to get to zero.

00:11:23.720 --> 00:11:25.810 And the question is whether or not that's realistic,

00:11:25.810 --> 00:11:26.830 because at the same time

00:11:26.830 --> 00:11:29.530 we're throwing more and more disposables at the problem,

00:11:29.530 --> 00:11:31.250 more and more cleaning chemicals;

00:11:31.250 --> 00:11:34.330 at the same time we're throwing more and more resource

00:11:34.330 --> 00:11:35.800 trying to get to zero,

00:11:35.800 --> 00:11:39.200 we're also increasing this hidden to date;

00:11:39.200 --> 00:11:42.870 hidden indirect disease burden from health care pollution.

00:11:42.870 --> 00:11:45.190 So we can't ignore that anymore.

00:11:45.190 --> 00:11:48.835 So ideally we find this nexus here,

00:11:48.835 --> 00:11:52.250 it's very hard to get there, but that's the aspiration.

00:11:52.250 --> 00:11:53.530 And we really have to question

00:11:53.530 --> 00:11:56.710 whether or not getting to zero is the right goal.

00:11:56.710 --> 00:11:59.640 And so causes of infection are multifactorial.

00:11:59.640 --> 00:12:00.700 The most important thing

00:12:00.700 --> 00:12:03.870 is aseptic and antiseptic practices;

00:12:03.870 --> 00:12:05.800 most notably hand washing.

00:12:05.800 --> 00:12:07.930 Patient health status is also important.

00:12:07.930 --> 00:12:10.720 So patients who have diabetes and immunocompromised

00:12:10.720 --> 00:12:12.020 are a greater risk.

00:12:12.020 --> 00:12:15.510 Exposure site, the type of the organism, its virulence,

00:12:15.510 --> 00:12:19.190 how much of that organism is introduced into the patient,

00:12:19.190 --> 00:12:22.220 and then preventive antibiotics and so forth.

00:12:22.220 --> 00:12:25.020 So the bottom line is that all these things contribute

00:12:25.020 --> 00:12:27.580 to health care acquired infections.

00:12:27.580 --> 00:12:29.690 And the most important thing we need to do

00:12:29.690 --> 00:12:30.770 is wash our hands.

00:12:30.770 --> 00:12:34.290 We don't do enough of it, even here in the United States.

00:12:34.290 --> 00:12:35.750 The World Health Organization

00:12:35.750 --> 00:12:38.810 has a big initiative around this,

00:12:38.810 --> 00:12:40.450 but we're not gonna cure the problem

00:12:40.450 --> 00:12:41.790 in sufficient hand washing.

00:12:41.790 --> 00:12:43.680 And we're not gonna cure diabetes

00:12:43.680 --> 00:12:46.960 by throwing more and more disposable devices at the problem.

00:12:46.960 --> 00:12:51.530 So we really need to look more deeply into these practices.

00:12:51.530 --> 00:12:53.030 And as we've learned with COVID,

00:12:53.030 --> 00:12:56.450 we've become so dependent on single use disposable;

00:12:56.450 --> 00:12:57.850 not only devices for patients,

00:12:57.850 --> 00:12:59.970 but our personal protective equipment or PPE.

00:12:59.970 --> 00:13:03.493 So here you're seeing reusable and disposable face masks,

00:13:05.030 --> 00:13:08.150 impermeable gowns, or semipermeable gowns.

00:13:08.150 --> 00:13:09.980 And in this case, video laryngoscopes

00:13:09.980 --> 00:13:13.210 or a type of device we use to put in breathing tubes.

00:13:13.210 --> 00:13:15.630 We're so dependent on single use disposables;

00:13:15.630 --> 00:13:18.600 and with COVID, the supply chain has been interrupted.

00:13:18.600 --> 00:13:22.140 So decreasing the amount of supplies we can actually obtain.

00:13:22.140 --> 00:13:25.180 At the same time, we've seen massive surges in demand.

00:13:25.180 --> 00:13:27.620 And so we've had no choice but to,

00:13:27.620 --> 00:13:30.250 and the question is why we weren't using more reusables

00:13:30.250 --> 00:13:33.760 to begin with, which by and large

00:13:33.760 --> 00:13:35.660 have lower environmental footprints

00:13:35.660 --> 00:13:38.560 and sometimes even are even cost beneficial.

00:13:38.560 --> 00:13:39.850 But we were caught with our pants down

00:13:39.850 --> 00:13:41.140 with the COVID pandemic;

00:13:41.140 --> 00:13:43.453 to the point where we've had to reuse,

00:13:44.550 --> 00:13:47.410 extend the life of reused reusable devices,

00:13:47.410 --> 00:13:49.410 and sometimes not so safely.

00:13:49.410 --> 00:13:51.553 There is a third party procedure

00:13:55.600 --> 00:13:57.200 called medical device reprocessing,

00:13:57.200 --> 00:13:59.954 which is an entire market that can clean

00:13:59.954 --> 00:14:02.750 and return reusable devices,

00:14:02.750 --> 00:14:05.320 sorry, single use disposable devices for safe reuse.

00:14:05.320 --> 00:14:07.920 And in fact, we've had to figure out

00:14:07.920 --> 00:14:09.180 under the Emergency Use Act,

00:14:09.180 --> 00:14:11.450 how to safely extend and reuse these devices.

00:14:11.450 --> 00:14:13.670 And we've done so safely

00:14:13.670 --> 00:14:15.980 to the point where it begs the question,

00:14:15.980 --> 00:14:17.590 what's the difference between a reusable

00:14:17.590 --> 00:14:21.520 and disposable devices, if we can reuse disposables,

00:14:21.520 --> 00:14:24.380 not always, but in sometimes safely?

00:14:24.380 --> 00:14:26.290 So what is a disposable device?

00:14:26.290 --> 00:14:29.460 Well, this is a actually a label that comes from industry.

00:14:29.460 --> 00:14:33.420 So single use disposable does not mean it can't be reused.

00:14:33.420 --> 00:14:35.190 It means that whoever cleans it

00:14:35.190 --> 00:14:38.350 assumes the risk of its functionality.

00:14:38.350 --> 00:14:40.220 Hospitals tend to not want that risk.

00:14:40.220 --> 00:14:43.480 So they've externalized that procedure,

00:14:43.480 --> 00:14:47.840 but only 2-3% of approved devices are currently reprocessed.

00:14:47.840 --> 00:14:52.760 So we have to rethink and come up with better solutions

00:14:52.760 --> 00:14:57.760 to bolster the resiliency of our supply chain,

00:14:58.440 --> 00:15:02.790 which also improves environmental mission.

00:15:02.790 --> 00:15:05.850 So we need to move from a linear health care economy,

00:15:05.850 --> 00:15:07.940 which is essentially, take-make waste

00:15:07.940 --> 00:15:11.280 where we extract materials, make them, use them,

00:15:11.280 --> 00:15:13.100 and then eventually throw them away.

00:15:13.100 --> 00:15:16.950 Principles of the circular economy are things like recycling

00:15:16.950 --> 00:15:19.600 which is probably the last thing that we wanna do.

00:15:19.600 --> 00:15:22.110 We wanna keep things in use and reuse them,

00:15:22.110 --> 00:15:25.130 repurpose them for alternative uses when we can't,

00:15:25.130 --> 00:15:28.090 refurbish them, and most importantly,

00:15:28.090 --> 00:15:30.650 we need to reduce the things that we use,

00:15:30.650 --> 00:15:31.860 and we need to redesign them

00:15:31.860 --> 00:15:33.020 so that they are easier to clean.

00:15:33.020 --> 00:15:35.420 So these are principles of the circular economy.

00:15:37.730 --> 00:15:40.530 And so the intergovernmental panel on climate change

00:15:40.530 --> 00:15:45.310 came out with a special report in 2018,

00:15:45.310 --> 00:15:47.990 basically saying that two degrees centigrade,

00:15:47.990 --> 00:15:51.890 which is the aspiration of the Paris Accord is not enough.

00:15:51.890 --> 00:15:53.740 We really need to limit our emissions

00:15:53.740 --> 00:15:58.740 to get to 1.5 degrees max average temperature increase.

00:15:59.630 --> 00:16:03.080 We've already seen one degree centigrade warming.

00:16:03.080 --> 00:16:05.440 This is the curve for business as usual.

00:16:05.440 --> 00:16:08.250 These are with the current policies and pledges,

00:16:08.250 --> 00:16:10.910 so even our current policies aren't enough

00:16:10.910 --> 00:16:15.070 to get us to the Commitment, to the Paris Climate Accord,

00:16:15.070 --> 00:16:16.270 and really we need

00:16:16.270 --> 00:16:20.650 to get to one and half degrees centigrade pathway.

00:16:20.650 --> 00:16:22.830 And the reason is to reduce the,

00:16:22.830 --> 00:16:24.760 it's not that we can stop climate change,

00:16:24.760 --> 00:16:28.300 but it's to reduce the worst harms that are predicted

00:16:28.300 --> 00:16:30.040 to occur, are already occurring,

00:16:30.040 --> 00:16:32.380 but especially predicted by the year 2100.

00:16:32.380 --> 00:16:34.683 We are likely to reach 1.5 degrees centigrade

00:16:34.683 --> 00:16:37.750 between 2030 and 2052.

00:16:37.750 --> 00:16:39.530 And really what it's going to take

00:16:39.530 --> 00:16:42.450 to get us to limit to one and a half degrees centigrade

00:16:42.450 --> 00:16:44.170 average temperature rise,

00:16:44.170 --> 00:16:47.930 is to cut our emissions by 45% by 2030,

00:16:47.930 --> 00:16:50.040 and get to net zero by 2050.

00:16:50.040 --> 00:16:52.300 And those of us who are committing the,

00:16:52.300 --> 00:16:54.760 contributing the most, especially in the U S,

00:16:54.760 --> 00:16:58.180 but not exclusively, we have to get there much faster.

00:16:58.180 --> 00:16:59.610 This is on average.

00:16:59.610 --> 00:17:02.540 This is possible within the laws of physics and chemistry,

00:17:02.540 --> 00:17:05.233 but really what it's going to take is political will.

00:17:06.830 --> 00:17:08.040 If you're not aware, you should know

00:17:08.040 --> 00:17:09.120 that the national health service

00:17:09.120 --> 00:17:10.740 has committed to get to net zero.

00:17:10.740 --> 00:17:11.860 They have a legal mandate,

00:17:11.860 --> 00:17:15.160 but they have actually made a public announcement.

00:17:15.160 --> 00:17:18.963 They're the largest health care organization in the world.

00:17:18.963 --> 00:17:21.950 They're the largest employer in Europe,

00:17:21.950 --> 00:17:25.630 and after the U S military and the Chinese military,

00:17:25.630 --> 00:17:27.910 the third largest employer in the world.

00:17:27.910 --> 00:17:29.970 So in order to get to net zero,

00:17:29.970 --> 00:17:31.450 we have to measure our missions.

00:17:31.450 --> 00:17:32.800 We have to know where they're coming from,

00:17:32.800 --> 00:17:35.150 and we need to have a plan of action

00:17:35.150 --> 00:17:38.070 to address where these are coming from.

00:17:38.070 --> 00:17:43.070 So improving the electricity source.

00:17:43.530 --> 00:17:45.090 I mentioned that most of the emissions

00:17:45.090 --> 00:17:46.540 coming from our supply chain

00:17:46.540 --> 00:17:48.330 are in the manufacturing process.

00:17:48.330 --> 00:17:50.990 So obviously decarbonizing our electricity grid,

00:17:50.990 --> 00:17:52.310 getting off fossil fuels.

00:17:52.310 --> 00:17:54.550 It's one of the most important things we need to do.

00:17:54.550 --> 00:17:58.860 And I invite you to read their reports which is 86 pages,

00:17:58.860 --> 00:18:01.830 and cannot be done justice in this talk.

00:18:01.830 --> 00:18:03.410 So, but where do we go from here?

00:18:03.410 --> 00:18:06.010 So importantly, we have to quantify the pollutants

00:18:06.010 --> 00:18:08.140 from all our clinical activities.

00:18:08.140 --> 00:18:09.830 We need to include environmental emissions

00:18:09.830 --> 00:18:11.230 in the total cost of ownership

00:18:11.230 --> 00:18:13.830 as part of our overall decision-making.

00:18:13.830 --> 00:18:16.980 Public health needs to be elevated

00:18:16.980 --> 00:18:19.520 to the level of importance of patient safety.

00:18:19.520 --> 00:18:20.980 And it has to be right up there

00:18:20.980 --> 00:18:23.350 with what we mean by quality and value and care.

00:18:23.350 --> 00:18:26.260 And this needs to be leveraged through accountability;

00:18:26.260 --> 00:18:29.300 for example, through mandated pay for performance.

00:18:29.300 --> 00:18:34.300 So the value equation typically used by health care managers

00:18:34.490 --> 00:18:36.440 includes taken from the triple aim,

00:18:36.440 --> 00:18:39.390 that the outcomes for patients and populations

00:18:39.390 --> 00:18:40.610 need to be maximized.

00:18:40.610 --> 00:18:42.720 Financial costs need to be minimized,

00:18:42.720 --> 00:18:44.200 when needs to be factored in there

00:18:44.200 --> 00:18:47.550 are environmental missions in the social costs of care.

00:18:47.550 --> 00:18:49.410 We haven't even talked about social costs,

00:18:49.410 --> 00:18:51.900 things like not harming the communities

00:18:51.900 --> 00:18:54.570 that have the manufacturing plants

00:18:54.570 --> 00:18:58.290 and make our devices paying livable wages.

00:18:58.290 --> 00:19:00.060 So these also need to,

00:19:00.060 --> 00:19:02.170 so unlivable wages need to be minimized,

00:19:02.170 --> 00:19:04.100 or the social impacts need to be minimized.

00:19:04.100 --> 00:19:05.910 So earlier I mentioned the quadruple care.

00:19:05.910 --> 00:19:07.380 I don't have a picture for that.

00:19:07.380 --> 00:19:10.160 So famously there's the triple aim

00:19:10.160 --> 00:19:13.680 but the quadruple, the fourth leg of that has to do

00:19:13.680 --> 00:19:18.010 with staff satisfaction, that staff care about these issues.

00:19:18.010 --> 00:19:19.440 And so a summary of take home points,

00:19:19.440 --> 00:19:21.430 not all of which I've been able to touch upon,

00:19:21.430 --> 00:19:23.920 but that clinicians were driving health care pollution.

00:19:23.920 --> 00:19:27.610 We are the ones who decide how much to use, which to use,

00:19:27.610 --> 00:19:30.800 it is well-known we over diagnose, we over-treat.

00:19:30.800 --> 00:19:33.050 We fail to prevent disease.

00:19:33.050 --> 00:19:37.400 We fail to end, we failed to treat patients at end of life

00:19:37.400 --> 00:19:38.720 in ways that they want,

00:19:38.720 --> 00:19:43.020 and in ways that are inexpensive and minimize pollution.

00:19:43.020 --> 00:19:45.290 So that's a big area that we need to address.

00:19:45.290 --> 00:19:47.180 There's this problem of candy store culture

00:19:47.180 --> 00:19:49.220 and lack of accountability.

00:19:49.220 --> 00:19:52.600 And there's excess in our infection control practices.

00:19:52.600 --> 00:19:54.560 We need to engage one another,

00:19:54.560 --> 00:19:56.490 that this is about public health.

00:19:56.490 --> 00:19:58.000 This is about patient safety.

00:19:58.000 --> 00:19:59.403 They are one in the same.

00:20:00.410 --> 00:20:02.270 Not all clinicians can get involved

00:20:02.270 --> 00:20:05.570 and care about things like making their cafeteria

00:20:05.570 --> 00:20:09.580 more nutritious and more locally sustainable.

00:20:09.580 --> 00:20:11.510 Not every clinician can get involved

00:20:11.510 --> 00:20:14.630 with trying to make their facilities more energy efficient,

00:20:14.630 --> 00:20:18.840 but every one of us cares deeply and will get involved

00:20:18.840 --> 00:20:20.330 in how we take care of our patients.

00:20:20.330 --> 00:20:21.960 So we need to engage one another

00:20:21.960 --> 00:20:23.720 and how we take care of our patients.

00:20:23.720 --> 00:20:24.760 Our choices matter,

00:20:24.760 --> 00:20:27.230 while I have not been able to address in this talk,

00:20:27.230 --> 00:20:29.830 you will be hearing from the next two speakers

00:20:29.830 --> 00:20:34.520 about using metrics to be able to discern

00:20:34.520 --> 00:20:36.050 what's environmentally preferable

00:20:36.050 --> 00:20:38.870 in terms of drugs, devices in clinical care pathways;

00:20:38.870 --> 00:20:40.810 and how we put that all together.

00:20:40.810 --> 00:20:42.940 This process requires data.

00:20:42.940 --> 00:20:46.040 It requires more industry transparency.

00:20:46.040 --> 00:20:48.423 So the value-based payment model,

00:20:49.840 --> 00:20:52.020 particularly in the United States,

00:20:52.020 --> 00:20:54.890 needs to factor in resource conservation

00:20:54.890 --> 00:20:57.080 as how we hold one another accountable.

00:20:57.080 --> 00:20:59.070 That resource conservation

00:20:59.070 --> 00:21:01.760 is part of what we mean by quality care.

00:21:01.760 --> 00:21:03.570 This could not have been highlighted

00:21:03.570 --> 00:21:06.110 more than with the COVID pandemic.

00:21:06.110 --> 00:21:09.290 We have a moral responsibility to conserve resources

00:21:09.290 --> 00:21:11.200 and we can be held accountable to it

00:21:11.200 --> 00:21:12.710 through our payment models.

00:21:12.710 --> 00:21:14.760 We need to track our resource utilization

00:21:14.760 --> 00:21:17.740 and our emissions at the health care organization level,

00:21:17.740 --> 00:21:19.940 at the practice and practitioner level.

00:21:19.940 --> 00:21:21.840 This can be done.

00:21:21.840 --> 00:21:23.850 We need to add environmental performance metrics

00:21:23.850 --> 00:21:25.493 to the merit-based incentive payment system.

00:21:25.493 --> 00:21:28.030 This is through (indistinct) and Medicare and Medicaid.

00:21:28.030 --> 00:21:30.300 This is how we're gonna drive change.

00:21:30.300 --> 00:21:31.830 We need to address public policy

00:21:31.830 --> 00:21:35.230 and regulatory drivers of waste and disposability.

00:21:35.230 --> 00:21:36.840 Many of us feel very powerless

00:21:36.840 --> 00:21:39.200 based on our institutional practices

00:21:39.200 --> 00:21:41.720 or departments of public health or regulations.

00:21:41.720 --> 00:21:43.090 We can challenge them.

00:21:43.090 --> 00:21:45.710 We have the ability to do that.

00:21:45.710 --> 00:21:47.530 It's hard, but we can't throw up our hands.

00:21:47.530 --> 00:21:48.800 We have to get involved.

00:21:48.800 --> 00:21:51.930 And then certainly haven't talked about prevention.

00:21:51.930 --> 00:21:55.190 Self-care for us as physicians, but also for our patients;

00:21:55.190 --> 00:21:56.780 whole foods, plant-based diet,

00:21:56.780 --> 00:22:00.030 exercise, active transport, social, spiritual connections,

00:22:00.030 --> 00:22:02.520 green spaces this is all part of what has to happen

00:22:02.520 --> 00:22:05.707 in the transformation of care to prevent diseases.

00:22:05.707 --> 00:22:07.990 And certainly we need to address

00:22:07.990 --> 00:22:09.470 the social determinants of health.

00:22:09.470 --> 00:22:14.340 If we can't lift our population out of poverty

00:22:14.340 --> 00:22:18.820 to address basic economic needs

00:22:18.820 --> 00:22:21.210 and give basic access to health care,

00:22:21.210 --> 00:22:23.230 we're never gonna solve this problem.

00:22:23.230 --> 00:22:24.900 So we've got a lot of work to do today,

00:22:24.900 --> 00:22:26.070 but I'm certainly optimistic.

00:22:26.070 --> 00:22:27.953 And I thank you very much for your time.

00:22:33.350 --> 00:22:35.620 - Terrific, thank you so much Dr. Sherman.

00:22:35.620 --> 00:22:37.617 We sincerely appreciate it.

00:22:37.617 --> 00:22:41.140 All right, I am happy to hand over the helm

00:22:41.140 --> 00:22:44.033 to Dr. Jonathan Slutzman, who will be up next.

00:22:51.900 --> 00:22:52.820 - Thank you Shanda.

00:22:52.820 --> 00:22:54.550 And thank you Jodi.

00:22:54.550 --> 00:22:57.763 It's always a pleasure to follow you as best I can.

00:22:58.600 --> 00:23:00.700 So my task here today

00:23:00.700 --> 00:23:05.700 is to give you the super fast brief overview

00:23:06.050 --> 00:23:08.890 of health care sustainability science.

00:23:08.890 --> 00:23:10.010 For those of you who are fans

00:23:10.010 --> 00:23:11.540 of the reduced Shakespeare Company,

00:23:11.540 --> 00:23:15.120 this is health care sustainability science, abridged.

00:23:15.120 --> 00:23:16.770 Of course, if you have any questions,

00:23:16.770 --> 00:23:21.130 please ask, and we'll try to answer them afterwards.

00:23:21.130 --> 00:23:24.580 As a disclosure, I have received travel funding from 3M,

00:23:24.580 --> 00:23:28.740 but won't be discussing any specific items in this talk.

00:23:28.740 --> 00:23:30.730 So what is sustainability science?

00:23:30.730 --> 00:23:32.510 It's a research field.

00:23:32.510 --> 00:23:34.740 It's one where we look specifically

00:23:34.740 --> 00:23:38.470 at the interactions between the natural environment

00:23:38.470 --> 00:23:40.310 and social systems,

00:23:40.310 --> 00:23:45.310 and how those impact the challenge of sustainability,

00:23:45.670 --> 00:23:50.010 defined as meeting the needs of the present generation

00:23:50.010 --> 00:23:53.120 while preserving the abilities of future generations

00:23:53.120 --> 00:23:54.393 to meet their own needs.

00:23:55.460 --> 00:23:58.910 There are a number of tools within sustainability science.

00:23:58.910 --> 00:24:00.530 The one that I'm gonna highlight the most,

00:24:00.530 --> 00:24:04.350 and you heard Jodi mention it a little bit already,

00:24:04.350 --> 00:24:06.790 is life cycle assessment;

00:24:06.790 --> 00:24:11.520 which is a very powerful research tool that can be used

00:24:11.520 --> 00:24:14.660 to quantify the environmental impact,

00:24:14.660 --> 00:24:18.580 both upstream and downstream of a product or a process

00:24:18.580 --> 00:24:19.690 from cradle to grave;

00:24:19.690 --> 00:24:23.920 from raw material acquisition, through transportation,

00:24:23.920 --> 00:24:28.400 manufacturing, more transportation, use, reuse,

00:24:28.400 --> 00:24:31.360 reprocessing, and ultimately disposal.

00:24:31.360 --> 00:24:34.340 The idea being that if you want to compare different options

00:24:34.340 --> 00:24:38.020 whether it's single use disposables to durable equipment,

00:24:38.020 --> 00:24:41.940 or different surgical procedures

00:24:41.940 --> 00:24:44.890 that achieve the same clinical outcomes,

00:24:44.890 --> 00:24:47.380 then you can do it in a holistic way,

00:24:47.380 --> 00:24:51.010 in a whole body perspective;

00:24:51.010 --> 00:24:53.670 the same way that we should be making our decisions

00:24:53.670 --> 00:24:55.670 as we care for our patients.

00:24:55.670 --> 00:24:59.380 So this is the super-duper five-second version

00:24:59.380 --> 00:25:01.940 of how to do a life cycle assessment.

00:25:01.940 --> 00:25:02.773 I promise you,

00:25:02.773 --> 00:25:04.830 it will not qualify you to do it after this talk,

00:25:04.830 --> 00:25:06.840 but at least it'll give you a sense

00:25:06.840 --> 00:25:10.860 for what we'll be talking about in a few of the studies

00:25:10.860 --> 00:25:12.530 that I'll be reviewing shortly.

00:25:12.530 --> 00:25:15.630 There are four stages to a life cycle assessment.

00:25:15.630 --> 00:25:17.550 The first is the goal and scope definition.

00:25:17.550 --> 00:25:20.800 Meaning I'm going to sit down and decide,

00:25:20.800 --> 00:25:24.960 what am I including in my system or out of my system.

00:25:24.960 --> 00:25:27.640 And what are the purposes for the study at hand?

00:25:27.640 --> 00:25:29.710 There's a very, very different way of doing it.

00:25:29.710 --> 00:25:32.180 If you're an end-user

00:25:32.180 --> 00:25:34.990 talking about purchasing one particular product

00:25:34.990 --> 00:25:38.700 versus another product, versus a manufacturer perhaps,

00:25:38.700 --> 00:25:42.460 who's deciding in the production process

00:25:42.460 --> 00:25:44.350 which ways to do things.

00:25:44.350 --> 00:25:46.090 The next is the inventory analysis.

00:25:46.090 --> 00:25:50.830 That's where you would add up all of the emissions

00:25:50.830 --> 00:25:53.530 coming out of a product or a process,

00:25:53.530 --> 00:25:57.530 or the material inputs going into a product or a process,

00:25:57.530 --> 00:25:59.270 which leads to the impact assessment

00:25:59.270 --> 00:26:02.810 where we translate those material flows

00:26:02.810 --> 00:26:07.810 into some sort of normalized impact

00:26:08.290 --> 00:26:12.740 on different environmental qualities.

00:26:12.740 --> 00:26:14.900 And there are different categories of impacts

00:26:14.900 --> 00:26:16.130 that you might wanna include.

00:26:16.130 --> 00:26:17.770 Some that you might have heard of

00:26:17.770 --> 00:26:20.230 would be climate change potential,

00:26:20.230 --> 00:26:24.360 or ozone depletion potential or human health impacts.

00:26:24.360 --> 00:26:26.790 And then throughout the whole process

00:26:26.790 --> 00:26:28.790 comes interpretation analysis.

00:26:28.790 --> 00:26:30.850 It's a somewhat iterative approach

00:26:30.850 --> 00:26:33.080 that as you're doing it you're continuing

00:26:33.080 --> 00:26:34.340 to see what you're getting

00:26:34.340 --> 00:26:36.453 and how you can improve the process.

00:26:37.660 --> 00:26:39.160 So with that behind us,

00:26:39.160 --> 00:26:43.610 I'm going to give a really, really tiny taste

00:26:44.680 --> 00:26:49.680 of the spectrum of sustainability science in health care.

00:26:51.050 --> 00:26:55.180 Each of the four studies that I'll be discussing

00:26:55.180 --> 00:26:58.351 are published in peer reviewed publications.

00:26:58.351 --> 00:27:00.290 And I believe that all of them

00:27:00.290 --> 00:27:03.880 are even in the last handful of years.

00:27:03.880 --> 00:27:06.240 We're gonna start at the highest level here

00:27:06.240 --> 00:27:08.330 where Jodi Sherman and Matt Eckelman.

00:27:08.330 --> 00:27:11.820 You heard from Dr. Sherman just a couple of minutes ago,

00:27:11.820 --> 00:27:15.580 did this study with Matt Eckelman at Northeastern University

00:27:15.580 --> 00:27:18.530 trying to quantify what are the environmental impacts

00:27:18.530 --> 00:27:20.870 of the entire U S health care system.

00:27:20.870 --> 00:27:23.330 And if you've ever quoted the number

00:27:23.330 --> 00:27:27.030 that about 10% of U S greenhouse gas emissions

00:27:27.030 --> 00:27:28.170 come from health care,

00:27:28.170 --> 00:27:30.870 this is the source for that data point.

00:27:30.870 --> 00:27:34.980 And what Sherman and Eckelman did, was what we call

00:27:34.980 --> 00:27:39.610 an environmental economic input-output life cycle assessment

00:27:39.610 --> 00:27:42.890 where they took data,

00:27:42.890 --> 00:27:47.060 economic data on spending patterns essentially,

00:27:47.060 --> 00:27:52.060 for U S health care, and used translation tables,

00:27:52.240 --> 00:27:55.030 their economic input-output tables

00:27:55.030 --> 00:28:00.030 that try to connect a dollar spent in one particular field,

00:28:00.100 --> 00:28:01.810 where does that then go?

00:28:01.810 --> 00:28:05.000 And what are the emissions potentially associated with that?

00:28:05.000 --> 00:28:09.550 For example, if you spend $10 on ground transportation

00:28:09.550 --> 00:28:13.540 or you spend $100 on pharmaceuticals,

00:28:13.540 --> 00:28:18.540 or $1000 on durable medical equipment,

00:28:18.610 --> 00:28:20.720 what are the emissions associated with that?

00:28:20.720 --> 00:28:24.420 And those kinds of data are great

00:28:24.420 --> 00:28:29.160 for looking at very large scale systems.

00:28:29.160 --> 00:28:32.070 You can imagine that what I just described before

00:28:32.070 --> 00:28:33.450 of doing a life cycle assessment,

00:28:33.450 --> 00:28:35.940 adding up all of the inventory components

00:28:35.940 --> 00:28:38.840 for your product or your process, can be quite tedious

00:28:38.840 --> 00:28:41.960 even for a simple small scale item

00:28:41.960 --> 00:28:45.380 like the pad of paper that's sitting on your desk right now

00:28:45.380 --> 00:28:46.900 for you to take notes.

00:28:46.900 --> 00:28:48.890 There are a lot of steps that go into that.

00:28:48.890 --> 00:28:50.720 So imagine trying to do that

00:28:50.720 --> 00:28:52.360 for a health care system as a whole,

00:28:52.360 --> 00:28:56.000 it is prohibitively complex.

00:28:56.000 --> 00:28:59.340 So that's where economic input-output comes along.

00:28:59.340 --> 00:29:02.460 And you get these really interesting results

00:29:02.460 --> 00:29:05.500 where you can look at over time,

00:29:05.500 --> 00:29:08.040 in this case, the greenhouse gas emissions associated

00:29:08.040 --> 00:29:11.260 with the U S health care system as a whole.

00:29:11.260 --> 00:29:14.560 And what you can see is that, for the 11 years,

00:29:14.560 --> 00:29:17.653 that Sherman and Eckelman studied,

00:29:18.950 --> 00:29:23.540 both the proportion of total U S greenhouse gas emissions

00:29:23.540 --> 00:29:25.190 from health care has increased

00:29:25.190 --> 00:29:26.840 as well as the absolute number.

00:29:26.840 --> 00:29:30.770 So a number of industries actually decreased over that time,

00:29:30.770 --> 00:29:32.480 but health care continued to grow,

00:29:32.480 --> 00:29:35.810 and it shows the extent of the challenges

00:29:35.810 --> 00:29:37.210 that we in health care face.

00:29:38.170 --> 00:29:41.380 So if you look beyond greenhouse gas emissions

00:29:41.380 --> 00:29:46.380 and see that there are other output categories

00:29:46.880 --> 00:29:49.420 or environmental impact categories;

00:29:49.420 --> 00:29:50.960 you can get these kinds of results

00:29:50.960 --> 00:29:54.910 where you have an absolute number in some normalized unit.

00:29:54.910 --> 00:29:57.400 For example, if we look at the,

00:29:57.400 --> 00:30:02.400 let's say ODP here is ozone depletion potential,

00:30:03.560 --> 00:30:07.410 it's measured in kilograms of CFC 11 equivalence,

00:30:07.410 --> 00:30:10.170 and you can see what the health care total is

00:30:10.170 --> 00:30:11.730 versus the national total.

00:30:11.730 --> 00:30:14.690 And then the fraction that health care represents

00:30:14.690 --> 00:30:18.160 including the global warming potential up at the top,

00:30:18.160 --> 00:30:21.023 which is that 9.8, nearly 10% number.

00:30:22.400 --> 00:30:25.550 So let's move down from what this might have been,

00:30:25.550 --> 00:30:27.430 let's say the 50,000 foot study,

00:30:27.430 --> 00:30:30.200 and go down to about 10,000 feet.

00:30:30.200 --> 00:30:33.880 And here we have a study by McNeil Lily-White and Brown

00:30:33.880 --> 00:30:37.650 of carbon footprinting of operating theaters.

00:30:37.650 --> 00:30:42.650 This study was done by some Britains and some Canadians.

00:30:44.300 --> 00:30:46.720 So they call it an operating theater,

00:30:46.720 --> 00:30:49.410 where I come from they're operating rooms,

00:30:49.410 --> 00:30:52.760 but this was done looking at three different hospitals

00:30:52.760 --> 00:30:54.600 on three different continents.

00:30:54.600 --> 00:30:56.220 Vancouver General Hospital,

00:30:56.220 --> 00:30:58.370 the University of Minnesota Medical Center,

00:30:58.370 --> 00:31:01.640 and the John Radcliffe Hospital

00:31:01.640 --> 00:31:04.360 in the U K National Health Service.

00:31:04.360 --> 00:31:08.087 And what they did was looked at the scope one, scope two,

00:31:08.087 --> 00:31:09.960 and scope three emissions

00:31:09.960 --> 00:31:14.040 from the operating room complex at each of these hospitals.

00:31:14.040 --> 00:31:17.312 It turns out that they're not terribly different in size,

00:31:17.312 --> 00:31:21.700 so we can compare the numbers closely enough

00:31:21.700 --> 00:31:23.020 for our purposes.

00:31:23.020 --> 00:31:26.460 And in scope one, they had direct emissions

00:31:26.460 --> 00:31:31.460 of anesthetic gases, scope two were purchased energy,

00:31:31.500 --> 00:31:35.500 or they actually moved their onsite energy generation

00:31:35.500 --> 00:31:38.500 for heating into the scope tWo number of it.

00:31:38.500 --> 00:31:40.360 It made sense for their purposes,

00:31:40.360 --> 00:31:42.120 and it doesn't change the total.

00:31:42.120 --> 00:31:44.520 Although many people would consider that in scope one.

00:31:44.520 --> 00:31:45.640 And then scope three,

00:31:45.640 --> 00:31:50.423 they considered the supply chain for the operating rooms.

00:31:51.397 --> 00:31:54.050 And what they did was this hybrid

00:31:54.050 --> 00:31:56.060 greenhouse gas footprinting study,

00:31:56.060 --> 00:32:01.060 where they apply readily accessible

00:32:02.597 --> 00:32:06.690 and accepted greenhouse gas emission factors

00:32:06.690 --> 00:32:11.690 for their anesthetic gases and their energy generation

00:32:14.270 --> 00:32:19.270 based on grid and fossil fuel burning emissions.

00:32:19.670 --> 00:32:22.010 And then for the scope three emissions,

00:32:22.010 --> 00:32:24.310 which are the hardest to quantify,

00:32:24.310 --> 00:32:26.560 they basically did waste audits,

00:32:26.560 --> 00:32:29.410 and extrapolated to a year of waste generation

00:32:29.410 --> 00:32:30.510 from the (indistinct),

00:32:31.700 --> 00:32:34.310 separated into the predominant material

00:32:34.310 --> 00:32:38.320 which not surprisingly was mostly a variety of plastics,

00:32:38.320 --> 00:32:40.540 and then apply the factors for those.

00:32:40.540 --> 00:32:44.890 And what you see is that they're pretty large differences

00:32:44.890 --> 00:32:48.050 in the greenhouse gas emissions footprints

00:32:48.050 --> 00:32:51.350 from these three different sets of operating rooms

00:32:51.350 --> 00:32:55.090 with the number that jumps out, the biggest to me,

00:32:55.090 --> 00:32:57.750 is the huge difference in scope one emissions

00:32:57.750 --> 00:33:00.820 between these three hospitals with Vancouver General

00:33:00.820 --> 00:33:04.770 and the University of Minnesota, being fairly comparable;

00:33:04.770 --> 00:33:07.220 but the John Radcliffe Hospital being immensely lower.

00:33:07.220 --> 00:33:11.460 And that is, if you look in the top left table,

00:33:11.460 --> 00:33:15.640 predominantly driven by zero deaths fluorine use

00:33:15.640 --> 00:33:17.360 at John Radcliffe Hospital,

00:33:17.360 --> 00:33:18.960 it's just not available on formulary.

00:33:18.960 --> 00:33:21.010 And Dr. Sherman can wax poetic

00:33:21.010 --> 00:33:23.863 about the benefits of doing that at your own hospital.

00:33:24.920 --> 00:33:28.130 This kind of a method is really useful,

00:33:28.130 --> 00:33:31.230 for again, a larger scale study,

00:33:31.230 --> 00:33:34.230 but you can quibble a bit about that,

00:33:34.230 --> 00:33:35.740 that scope three emissions number,

00:33:35.740 --> 00:33:38.653 which as I said, is really challenging to quantify.

00:33:39.630 --> 00:33:42.040 So let's move down from the 10,000 foot level

00:33:42.040 --> 00:33:45.180 to more the 1000 foot level.

00:33:45.180 --> 00:33:48.170 And look at a process life cycle assessment

00:33:48.170 --> 00:33:52.440 where somebody would look at the individual components

00:33:52.440 --> 00:33:55.530 of a product or a process, and add that up,

00:33:55.530 --> 00:33:57.890 and get the emissions associated with that.

00:33:57.890 --> 00:34:01.070 Here we have another study by Dr. Sherman and Eckleman

00:34:01.070 --> 00:34:04.430 with Lewis Radley, assisting in the middle there.

00:34:04.430 --> 00:34:06.060 This is a life cycle assessment

00:34:06.060 --> 00:34:11.060 and a life cycle costing assessment of laryngoscopes.

00:34:12.270 --> 00:34:14.550 It's possible that at many of your facilities,

00:34:14.550 --> 00:34:15.720 you've seen a transition

00:34:15.720 --> 00:34:20.380 from reusable, durable laryngoscope, handles and blades,

00:34:20.380 --> 00:34:23.730 to some combination of disposable blades

00:34:23.730 --> 00:34:26.670 and potentially disposable handles as well.

00:34:26.670 --> 00:34:27.970 And as Dr. Sherman said,

00:34:27.970 --> 00:34:31.700 this is based on the potential for infection control

00:34:31.700 --> 00:34:33.950 with variable benefits.

00:34:33.950 --> 00:34:35.280 But let's answer the question

00:34:35.280 --> 00:34:36.860 of what are the environmental impacts?

00:34:36.860 --> 00:34:39.650 So the first figure that you see,

00:34:39.650 --> 00:34:44.650 is that the scope of boundary

00:34:44.930 --> 00:34:47.680 of what was included in the study

00:34:47.680 --> 00:34:50.460 and the different phases of the life cycle assessment

00:34:50.460 --> 00:34:52.150 that we talked about initially,

00:34:52.150 --> 00:34:53.820 and then the bottom of the lab boxes

00:34:53.820 --> 00:34:56.500 is the costs that were included.

00:34:56.500 --> 00:34:58.420 So here we have some results.

00:34:58.420 --> 00:35:01.220 Again, similar to that large scale,

00:35:01.220 --> 00:35:06.030 50,000 foot total health care system study,

00:35:06.030 --> 00:35:08.120 you have the same impact categories.

00:35:08.120 --> 00:35:10.680 You're just looking at a different set of options,

00:35:10.680 --> 00:35:14.170 and this is comparative rather than temporal.

00:35:14.170 --> 00:35:16.670 So we're not looking at the same system over time.

00:35:16.670 --> 00:35:18.920 We're looking at different options within a system.

00:35:18.920 --> 00:35:22.750 And these results are scaled so that the lowest impact

00:35:22.750 --> 00:35:25.810 is one, and the others are multiples of that.

00:35:25.810 --> 00:35:30.810 So you can see that in almost all categories,

00:35:30.820 --> 00:35:35.820 the multi-use blades, and multi-use handles

00:35:36.310 --> 00:35:38.280 under high level disinfection,

00:35:38.280 --> 00:35:39.980 have the least environmental impacts

00:35:39.980 --> 00:35:43.123 with single use disposable devices,

00:35:43.123 --> 00:35:45.930 in some cases hundreds of times

00:35:45.930 --> 00:35:48.030 more impactful on the environment.

00:35:48.030 --> 00:35:50.100 And you can make really pretty charts

00:35:50.100 --> 00:35:52.080 that show you just visually strikingly

00:35:52.080 --> 00:35:53.910 how different these are;

00:35:53.910 --> 00:35:57.120 but what's most striking about this study, I think,

00:35:57.120 --> 00:35:59.460 is the life cycle costing piece.

00:35:59.460 --> 00:36:02.730 And this chart right here, you're seeing the emissions.

00:36:02.730 --> 00:36:04.910 So these are greenhouse gas emissions.

00:36:04.910 --> 00:36:06.900 And then you can go to the next chart

00:36:06.900 --> 00:36:11.700 which is the same options in the same order,

00:36:11.700 --> 00:36:13.460 but here we're looking at the costs.

00:36:13.460 --> 00:36:15.900 And it's worth noting that the ones

00:36:15.900 --> 00:36:19.060 that are the most environmentally impactful,

00:36:19.060 --> 00:36:23.320 also happen to be the ones that are the most expensive.

00:36:23.320 --> 00:36:25.320 So this is not necessarily a case

00:36:25.320 --> 00:36:26.410 where we're gonna save money

00:36:26.410 --> 00:36:28.470 by using single use disposables,

00:36:28.470 --> 00:36:31.870 by not spending money on reprocessing.

00:36:31.870 --> 00:36:34.940 This is a case where doing the right thing environmentally

00:36:34.940 --> 00:36:38.653 will often help your financial bottom line as well.

00:36:39.650 --> 00:36:42.300 So we've gone from the 50,000 foot level

00:36:42.300 --> 00:36:46.560 to maybe the 10,000 foot level to the 1000 foot level.

00:36:46.560 --> 00:36:48.988 And now we're gonna go to ground level,

00:36:48.988 --> 00:36:51.290 and do some dumpster diving.

00:36:51.290 --> 00:36:55.690 This is from an emergency department waste audit.

00:36:55.690 --> 00:36:57.890 This is the most recently published of the studies

00:36:57.890 --> 00:36:59.590 that we're reviewing today.

00:36:59.590 --> 00:37:01.250 And this is one of mine,

00:37:01.250 --> 00:37:05.010 done with Sarah Sue at Brown and Cassie Thiel here,

00:37:05.010 --> 00:37:07.110 you're gonna hear from in just a minute or so,

00:37:07.110 --> 00:37:10.720 Mike Mellow at Brown, and then I was leading this study.

00:37:10.720 --> 00:37:14.000 We did perhaps one of the simplest

00:37:14.000 --> 00:37:17.160 kinds of health care sustainability studies there is,

00:37:17.160 --> 00:37:22.030 which was taking all of our trash and dividing it,

00:37:22.030 --> 00:37:26.080 and measuring it, quantifying it and reporting it.

00:37:26.080 --> 00:37:27.480 And this was the first time

00:37:27.480 --> 00:37:29.790 that a North American Emergency Department

00:37:29.790 --> 00:37:32.530 really did a dedicated waste audit.

00:37:32.530 --> 00:37:36.150 These numbers represent 100%

00:37:36.150 --> 00:37:40.100 of the waste generated from our emergency department

00:37:40.100 --> 00:37:43.610 in 24 hours, with the exception of pharmaceutical waste;

00:37:43.610 --> 00:37:45.680 which is complicated, why we didn't do that

00:37:45.680 --> 00:37:49.520 but it's actually a really small number for our facility.

00:37:49.520 --> 00:37:52.280 And the take home message is,

00:37:52.280 --> 00:37:53.680 that over the course of one day,

00:37:53.680 --> 00:37:58.680 we generated about 1400 pounds of waste.

00:37:59.010 --> 00:38:01.060 The vast majority of which was plastic.

00:38:01.060 --> 00:38:04.250 And if we extrapolate that over a year,

00:38:04.250 --> 00:38:09.250 we're talking about somewhere around 225 tons of waste,

00:38:11.010 --> 00:38:13.343 just from one emergency department.

00:38:14.829 --> 00:38:19.550 The disposing of that waste for one day, just the disposal,

00:38:19.550 --> 00:38:22.980 not the upstream impacts, but just the disposal,

00:38:22.980 --> 00:38:27.700 is equivalent to driving your average car 7,700 miles;

00:38:27.700 --> 00:38:28.950 which for some people

00:38:28.950 --> 00:38:32.470 is actually more than a year of driving;

00:38:32.470 --> 00:38:35.273 is just disposing of one day of our waste.

00:38:36.387 --> 00:38:38.150 So it can be quite impactful.

00:38:38.150 --> 00:38:40.980 And then as you saw from the McNeil Study,

00:38:40.980 --> 00:38:43.540 these waste audit numbers can then be an input

00:38:43.540 --> 00:38:45.880 for additional footprinting studies.

00:38:45.880 --> 00:38:47.280 So our key takeaways:

00:38:47.280 --> 00:38:49.510 sustainability science can identify many things

00:38:49.510 --> 00:38:52.880 that we can do that can have marginal environmental benefits

00:38:52.880 --> 00:38:54.720 and an aggregate can be quite significant.

00:38:54.720 --> 00:38:56.110 And some of the things we identify

00:38:56.110 --> 00:38:58.630 can be pretty big on their own.

00:38:58.630 --> 00:39:01.970 However, these larger scale economy-wide shifts.

00:39:01.970 --> 00:39:05.370 like Dr. Sherman mentioned, energy source changes in U K,

00:39:05.370 --> 00:39:07.020 can have a much larger impact.

00:39:07.020 --> 00:39:08.590 And that I want you to take away

00:39:08.590 --> 00:39:11.900 that life cycle assessment is an extremely powerful tool

00:39:11.900 --> 00:39:16.130 for making these evidence-based clinical procurement

00:39:16.130 --> 00:39:17.910 and other decisions when it comes to

00:39:17.910 --> 00:39:20.340 what is best for us environmentally.

00:39:20.340 --> 00:39:21.173 And with that,

00:39:21.173 --> 00:39:24.053 I will say thank you and turn it back over to Shanda.

00:39:26.990 --> 00:39:29.310 - Excellent, thank you so much Dr. Slutzman.

00:39:29.310 --> 00:39:31.920 This has been terrific.

00:39:31.920 --> 00:39:34.100 All right, so now I am eager

00:39:34.100 --> 00:39:39.100 to get Dr. Cassandra Thiel session up and rolling here.

00:39:41.050 --> 00:39:44.080 And so she is not able to join us today unfortunately,

00:39:44.080 --> 00:39:46.693 but we will hear her Zoomed in.

00:39:50.270 --> 00:39:51.103 - [Cassandra] All right.

00:39:52.170 --> 00:39:53.850 Well, thank you very much for having me.

00:39:53.850 --> 00:39:55.100 I'm sorry I can't be there in person,

00:39:55.100 --> 00:39:58.290 but I'm glad to be able to share some of the work

00:39:58.290 --> 00:40:00.610 that myself and colleagues have done in ophthalmology

00:40:00.610 --> 00:40:03.333 to work on sustainability in clinical care pathways.

00:40:05.460 --> 00:40:07.850 Let me (faintly speaking) slides.

00:40:07.850 --> 00:40:09.800 So why are we looking at ophthalmology?

00:40:10.680 --> 00:40:12.280 It's a really interesting specialty.

00:40:12.280 --> 00:40:14.530 One, they perform a lot of surgeries

00:40:14.530 --> 00:40:18.430 and surgeries are resource intensive and quite wasteful.

00:40:18.430 --> 00:40:20.270 This is just one of my favorite studies,

00:40:20.270 --> 00:40:22.480 is from a Neurosurgical Department out of California,

00:40:22.480 --> 00:40:25.120 but they monitored How many of their supplies

00:40:25.120 --> 00:40:26.610 they were throwing out without being used.

00:40:26.610 --> 00:40:29.000 And found it was about 13% of their total supply costs,

00:40:29.000 --> 00:40:30.810 were completely unused.

00:40:30.810 --> 00:40:33.440 If they could somehow not waste those materials,

00:40:33.440 --> 00:40:36.490 they would save about $3 million a year in their department.

00:40:36.490 --> 00:40:38.540 And this is very common across all surgeries,

00:40:38.540 --> 00:40:39.820 even within ophthalmology.

00:40:39.820 --> 00:40:42.270 So it's a good area to focus on.

00:40:42.270 --> 00:40:43.620 Another reason we're looking at ophthalmology

00:40:43.620 --> 00:40:45.750 is because it's a large specialty.

00:40:45.750 --> 00:40:47.200 So they performed cataract surgeries

00:40:47.200 --> 00:40:48.860 kind of their bread and butter.

00:40:48.860 --> 00:40:50.980 And basically everyone needs cataract surgeries,

00:40:50.980 --> 00:40:52.220 if you live long enough.

00:40:52.220 --> 00:40:54.550 It's one of the most performed procedures worldwide.

00:40:54.550 --> 00:40:55.383 And in the U S,

00:40:55.383 --> 00:40:57.610 we spend a lot of money on cataract surgeries.

00:40:57.610 --> 00:41:00.320 About 1/2 of that spend is coming from Medicare,

00:41:00.320 --> 00:41:02.440 and cataract surgeries alone account for 12%

00:41:02.440 --> 00:41:03.660 of Medicare's budget.

00:41:03.660 --> 00:41:07.163 So this is a really big reach within a specialty,

00:41:08.040 --> 00:41:09.810 and beyond that it's actually growing, right?

00:41:09.810 --> 00:41:13.000 So we have more people, they're getting older,

00:41:13.000 --> 00:41:15.540 and we're also trying to expand capacity into regions

00:41:15.540 --> 00:41:16.980 where they previously didn't really

00:41:16.980 --> 00:41:19.763 have a lot of ophthalmologists or access to eyecare.

00:41:21.070 --> 00:41:24.210 So this has a lot of potential for change.

00:41:24.210 --> 00:41:26.250 And that was one of the exciting reasons

00:41:26.250 --> 00:41:28.150 to look at ophthalmology specifically.

00:41:29.070 --> 00:41:31.680 So what do we know about what's going on ophthalmology?

00:41:31.680 --> 00:41:33.870 Well, there was a study that was published 2013

00:41:33.870 --> 00:41:34.800 out of the U K,

00:41:34.800 --> 00:41:37.610 it was on carbon footprint of cataract surgery.

00:41:37.610 --> 00:41:39.300 The most common form of cataract surgery

00:41:39.300 --> 00:41:41.170 in developed countries

00:41:41.170 --> 00:41:43.720 is called phacoemulsification or phaco.

00:41:43.720 --> 00:41:45.890 And so they looked at phacoemulsification

00:41:45.890 --> 00:41:48.090 and found that it emits about 180 kilos

00:41:48.090 --> 00:41:49.500 of carbon dioxide equivalence.

00:41:49.500 --> 00:41:51.900 So these are the greenhouse gas emissions.

00:41:51.900 --> 00:41:54.020 That's a good one to a British person living for a week.

00:41:54.020 --> 00:41:55.050 And this is first surgery

00:41:55.050 --> 00:41:58.600 that lasts anywhere from 30 minutes to an hour typically.

00:41:58.600 --> 00:41:59.690 Over 1/2 of those emissions

00:41:59.690 --> 00:42:01.840 were coming from procurement of supplies,

00:42:01.840 --> 00:42:02.820 which is not surprising

00:42:02.820 --> 00:42:06.120 for those of us who study life cycle assessments

00:42:06.120 --> 00:42:08.650 or carbon footprints of surgical procedures.

00:42:08.650 --> 00:42:11.950 A lot of the footprint comes from the supplies.

00:42:11.950 --> 00:42:13.580 And of course in the U K, similar to the U S,

00:42:13.580 --> 00:42:16.160 a lot of the supplies are single use and disposable.

00:42:16.160 --> 00:42:19.603 So this led to some interesting thoughts.

00:42:20.910 --> 00:42:22.280 My first thought was,

00:42:22.280 --> 00:42:24.130 okay, so we have these developing countries

00:42:24.130 --> 00:42:25.350 where everything, or sorry,

00:42:25.350 --> 00:42:26.550 developed countries where everything

00:42:26.550 --> 00:42:30.020 is kind of on a single use disposable end of the spectrum,

00:42:30.020 --> 00:42:31.550 but there's gotta be other places in the world

00:42:31.550 --> 00:42:32.597 where that's not the case.

00:42:32.597 --> 00:42:34.670 But these surgeries are conducted everywhere.

00:42:34.670 --> 00:42:36.840 Not everyone can afford

00:42:36.840 --> 00:42:39.480 to use supplies in the same way that we do.

00:42:39.480 --> 00:42:42.840 And so this took me to a health care system

00:42:42.840 --> 00:42:45.800 called Aravind Eye Care, it's in Southern India.

00:42:45.800 --> 00:42:46.670 They're very notable.

00:42:46.670 --> 00:42:47.890 There's actually a Ted talk on them

00:42:47.890 --> 00:42:50.253 if you wanna learn more about what they do,

00:42:51.230 --> 00:42:55.210 they really developed out of financial efficiency models.

00:42:55.210 --> 00:42:58.350 So their founder initially thought,

00:42:58.350 --> 00:43:00.070 if McDonald's can make hamburgers so cheap

00:43:00.070 --> 00:43:01.370 for everyone around the world,

00:43:01.370 --> 00:43:03.820 why can't we make cataract care,

00:43:03.820 --> 00:43:06.540 just as cheap for everyone around the world?

00:43:06.540 --> 00:43:08.750 So their mission is really geared at providing eye care

00:43:08.750 --> 00:43:10.870 for people who can barely afford it.

00:43:10.870 --> 00:43:14.590 And so they've designed a surgical center here

00:43:14.590 --> 00:43:18.570 that is very efficient, but is looking at reducing costs

00:43:18.570 --> 00:43:21.010 to the point where they can be a profitable health systems.

00:43:21.010 --> 00:43:23.460 They don't rely on donations, they're consistent.

00:43:24.560 --> 00:43:27.320 But where people can pay either the market rate

00:43:27.320 --> 00:43:31.190 or anything below that down to zero.

00:43:31.190 --> 00:43:33.770 So I think it's about 2/3 of their surgeries

00:43:33.770 --> 00:43:37.050 or 1/2 of their surgeries are free or reduced rate.

00:43:37.050 --> 00:43:39.100 And with the people who pay the full rate,

00:43:39.100 --> 00:43:41.370 they're actually a profitable model.

00:43:41.370 --> 00:43:44.030 And so it was really based out of finances,

00:43:44.030 --> 00:43:45.280 how they develop their efficiency.

00:43:45.280 --> 00:43:48.380 But I went there to look at, of course, the resource use;

00:43:48.380 --> 00:43:51.140 because that does tie into that financial efficiency.

00:43:51.140 --> 00:43:53.030 So here you can see their operating room,

00:43:53.030 --> 00:43:55.230 a little different from in the U S,

00:43:55.230 --> 00:43:57.570 we have four beds and two surgeons.

00:43:57.570 --> 00:44:00.040 So one surgeon operates on two beds.

00:44:00.040 --> 00:44:01.390 Typically they're operating on one bed

00:44:01.390 --> 00:44:02.810 while the other one's being prepped.

00:44:02.810 --> 00:44:05.290 They'll flip all the equipment over, operate on that one,

00:44:05.290 --> 00:44:08.600 while the first one is being kinda cleaned up

00:44:08.600 --> 00:44:09.660 and the next patient is brought in

00:44:09.660 --> 00:44:12.490 and they just go back and forth between the beds.

00:44:12.490 --> 00:44:15.180 So this really reduces their overhead.

00:44:15.180 --> 00:44:16.013 And you can also see

00:44:16.013 --> 00:44:18.920 that they have a lot of reusable supplies here.

00:44:18.920 --> 00:44:19.900 This is prior to COVID,

00:44:19.900 --> 00:44:23.050 things have changed a little bit during the pandemic;

00:44:23.050 --> 00:44:24.870 but essentially they have all reusable masks,

00:44:24.870 --> 00:44:28.720 gowns, head coverings, drapes,

00:44:28.720 --> 00:44:31.470 all of that stuff is reusable.

00:44:31.470 --> 00:44:33.510 So they've really cut down on the resource efficiency

00:44:33.510 --> 00:44:35.170 or resource use.

00:44:35.170 --> 00:44:37.787 And you may be wondering now, well,

00:44:37.787 --> 00:44:38.970 that's all well and good,

00:44:38.970 --> 00:44:41.890 but what about infection control practices?

00:44:41.890 --> 00:44:44.510 And that's where Aravind was particularly interesting

00:44:44.510 --> 00:44:47.730 to look at because they have really good metrics

00:44:47.730 --> 00:44:50.970 for their complication rates, rates of success,

00:44:50.970 --> 00:44:54.450 post-surgery, and they're actually better than the U S

00:44:54.450 --> 00:44:56.080 in quite a few metrics.

00:44:56.080 --> 00:44:58.060 So that last one there, the rates of endophthalmitis

00:44:58.060 --> 00:45:01.410 that's an eye infection that is not very common,

00:45:01.410 --> 00:45:03.020 but it's one of the worst outcomes

00:45:03.020 --> 00:45:04.670 you can get in a cataract surgery.

00:45:04.670 --> 00:45:05.930 And you can see the rates for that

00:45:05.930 --> 00:45:07.273 are much lower than the U S.

00:45:07.273 --> 00:45:09.580 So this is a really interesting place to look,

00:45:09.580 --> 00:45:12.550 because they're clearly doing their surgeries well,

00:45:12.550 --> 00:45:13.670 but in a very different way

00:45:13.670 --> 00:45:15.370 from how we do things in the U S.

00:45:16.410 --> 00:45:18.610 So while I was there and monitored their waste generation,

00:45:18.610 --> 00:45:21.137 this is just one visual for how different things are.

00:45:21.137 --> 00:45:25.300 And we have one phaco in the U S on the left,

00:45:25.300 --> 00:45:26.830 it's the garbage produced there;

00:45:26.830 --> 00:45:30.450 and 93 phacos are ovens on the right.

00:45:30.450 --> 00:45:33.060 So a huge difference in the amount of materials

00:45:33.060 --> 00:45:35.283 that we're using in each of these surgeries.

00:45:36.480 --> 00:45:38.250 This is look at the carbon footprint.

00:45:38.250 --> 00:45:41.770 So this is comparing Aravind to that U K based study.

00:45:41.770 --> 00:45:43.220 And what you'll notice is that,

00:45:43.220 --> 00:45:45.410 of course, the U K has a much higher footprint

00:45:45.410 --> 00:45:49.230 than Aravind does for the same procedure.

00:45:49.230 --> 00:45:51.660 So it's like driving car 500 kilometers in the U K,

00:45:51.660 --> 00:45:53.283 versus 25 kilometers in Aravind.

00:45:54.820 --> 00:45:57.190 And it's just really interesting to note this, right?

00:45:57.190 --> 00:45:59.720 We have the data now to show the resource use

00:45:59.720 --> 00:46:02.220 and these are just some ways to visualize it.

00:46:02.220 --> 00:46:04.850 So Aravind has some really interesting takeaways

00:46:04.850 --> 00:46:06.170 that we could potentially bring back

00:46:06.170 --> 00:46:09.030 to more developed countries.

00:46:09.030 --> 00:46:11.000 The first one is really about their physical layout.

00:46:11.000 --> 00:46:12.870 So they paid very close attention

00:46:12.870 --> 00:46:14.750 to setting up their operating rooms,

00:46:14.750 --> 00:46:18.840 in a way that would optimize for the surgeries themselves.

00:46:18.840 --> 00:46:20.890 So it's set up a lot like an assembly line.

00:46:20.890 --> 00:46:24.050 It may be uncomfortable for a lot of patients in America,

00:46:24.050 --> 00:46:25.020 at least to go through this;

00:46:25.020 --> 00:46:26.680 in India, didn't seem to be a problem at all

00:46:26.680 --> 00:46:29.980 but the patients are always the ones who are waiting.

00:46:29.980 --> 00:46:32.890 It's never the surgeons or the surgical teams,

00:46:32.890 --> 00:46:34.920 because they're the high value item.

00:46:34.920 --> 00:46:37.710 So patients are kind of ushered through the system.

00:46:37.710 --> 00:46:40.210 They're given their preoperative drugs.

00:46:40.210 --> 00:46:42.180 They go through anesthesia

00:46:42.180 --> 00:46:43.850 prior to going to the operating room.

00:46:43.850 --> 00:46:46.327 They are led into the operating room and let out.

00:46:46.327 --> 00:46:48.190 But the surgeons always have

00:46:48.190 --> 00:46:50.350 someone available to operate on.

00:46:50.350 --> 00:46:52.130 And it's part of that is the physical layout,

00:46:52.130 --> 00:46:55.080 the flow of the patients through that system.

00:46:55.080 --> 00:46:57.140 They also engage in what's called task shifting.

00:46:57.140 --> 00:46:59.020 So this is basically,

00:46:59.020 --> 00:47:01.510 they've trained a lot of young women actually,

00:47:01.510 --> 00:47:03.390 there's a different story on that end of the spectrum.

00:47:03.390 --> 00:47:05.190 But young women from the community

00:47:05.190 --> 00:47:07.970 are trained up basically as nurses,

00:47:07.970 --> 00:47:11.095 they call them mid-level ophthalmic professionals;

00:47:11.095 --> 00:47:13.970 and they handle a lot of these other tasks

00:47:13.970 --> 00:47:17.253 so that the surgeon can focus just on cataract surgeries.

00:47:18.100 --> 00:47:20.900 So the woman in the center here is their scrub nurse,

00:47:20.900 --> 00:47:23.600 the two in green, in the darker green,

00:47:23.600 --> 00:47:25.100 they're the ones bringing the patients in and out.

00:47:25.100 --> 00:47:28.130 They do the preoperative work and the post-operative work.

00:47:28.130 --> 00:47:29.660 Because you don't necessarily need a surgeon

00:47:29.660 --> 00:47:31.320 to do those things.

00:47:31.320 --> 00:47:32.400 So this allows the surgeon

00:47:32.400 --> 00:47:35.823 to just do cut to close cases all day in.

00:47:37.310 --> 00:47:38.640 Standardization is another thing

00:47:38.640 --> 00:47:41.520 that Aravind has gotten very good at.

00:47:41.520 --> 00:47:42.353 They have standardized

00:47:42.353 --> 00:47:44.640 of course, the pathway steps for the patients.

00:47:44.640 --> 00:47:46.040 So every patient's doing the same thing

00:47:46.040 --> 00:47:47.640 all the way through the surgery.

00:47:48.640 --> 00:47:50.080 They standardized the instrumentation.

00:47:50.080 --> 00:47:51.300 I think this is really important,

00:47:51.300 --> 00:47:53.450 because in the U S we see a lot of variability

00:47:53.450 --> 00:47:57.090 in what materials are used during the surgery,

00:47:57.090 --> 00:48:00.270 even if we have custom packs or standardized kits.

00:48:00.270 --> 00:48:02.620 So every surgeon might use a different proportion

00:48:02.620 --> 00:48:04.140 of those things.

00:48:04.140 --> 00:48:05.510 And even for reusable items

00:48:05.510 --> 00:48:07.350 that can lead to a lot of wasted effort,

00:48:07.350 --> 00:48:08.940 because we have to clean the whole kit,

00:48:08.940 --> 00:48:10.910 even if it's not used.

00:48:10.910 --> 00:48:13.350 So Aravind has standardized those instruments phase

00:48:13.350 --> 00:48:15.960 and pretty much every surgeon uses almost everything

00:48:15.960 --> 00:48:17.750 that's in there every time;

00:48:17.750 --> 00:48:19.830 which leads to this third part of standardization,

00:48:19.830 --> 00:48:21.720 which is the surgical approach.

00:48:21.720 --> 00:48:23.210 So there's very little variation

00:48:23.210 --> 00:48:25.950 between surgeons on how they operate,

00:48:25.950 --> 00:48:27.410 which means it could be a little bit boring

00:48:27.410 --> 00:48:28.810 for the surgeons themselves, right?

00:48:28.810 --> 00:48:32.090 They're able to do the surgery in about five to 10 minutes

00:48:32.090 --> 00:48:35.040 instead of the half hour to an hour, it takes here.

00:48:35.040 --> 00:48:37.840 So you can imagine if you're operating on 40 people a day,

00:48:37.840 --> 00:48:39.140 doing the same procedure over and over,

00:48:39.140 --> 00:48:40.280 it could get a little bit boring.

00:48:40.280 --> 00:48:41.730 But the benefit of that

00:48:41.730 --> 00:48:44.270 is that everyone on surgical team

00:48:44.270 --> 00:48:45.960 knows exactly what's happening.

00:48:45.960 --> 00:48:47.930 And with that standardization,

00:48:47.930 --> 00:48:51.400 I think that actually improves your outcomes as well.

00:48:51.400 --> 00:48:52.680 Another thing they focus on of course

00:48:52.680 --> 00:48:54.550 is reducing their waste.

00:48:54.550 --> 00:48:57.270 Waste is just money thrown out the door.

00:48:57.270 --> 00:48:59.740 And to do this, they maximize reuse,

00:48:59.740 --> 00:49:01.490 and that includes their drugs.

00:49:01.490 --> 00:49:02.880 Their drugs are all multi-dose.

00:49:02.880 --> 00:49:04.940 So they're not throwing out partial bottles.

00:49:04.940 --> 00:49:07.310 They're using them on multiple patients,

00:49:07.310 --> 00:49:08.743 as long as they're safe.

00:49:09.850 --> 00:49:12.410 And they're able to basically reduce

00:49:12.410 --> 00:49:14.230 how much garbage they're producing,

00:49:14.230 --> 00:49:16.070 and also minimize how much material

00:49:16.070 --> 00:49:18.620 they're bringing into each surgery.

00:49:18.620 --> 00:49:20.640 Finally, and this is the most important,

00:49:20.640 --> 00:49:22.782 they're maintaining their safety.

00:49:22.782 --> 00:49:23.640 So they can't maintain,

00:49:23.640 --> 00:49:26.007 they can't actually achieve their mission, right?

00:49:26.007 --> 00:49:28.550 Of a high value eyecare for low costs,

00:49:28.550 --> 00:49:31.960 if their surgeries are not doing anything good

00:49:31.960 --> 00:49:33.250 for their patients.

00:49:33.250 --> 00:49:35.010 If the patients are leaving worse than they came in,

00:49:35.010 --> 00:49:36.890 and then there's no point in doing this at all.

00:49:36.890 --> 00:49:38.840 And that's probably the ultimate waste, right?

00:49:38.840 --> 00:49:40.300 Is surgeries that don't go well.

00:49:40.300 --> 00:49:44.480 So they're really careful about maintaining safety,

00:49:44.480 --> 00:49:45.550 about making sure that everything

00:49:45.550 --> 00:49:49.150 that needs to be sterilized between cases is sterilized,

00:49:49.150 --> 00:49:52.003 and that's really key to their model for its success.

00:49:53.590 --> 00:49:55.740 So to go back into the U S,

00:49:55.740 --> 00:49:58.920 we see a lot of variability in our cases.

00:49:58.920 --> 00:50:01.030 So this is just to look at surgical supply costs

00:50:01.030 --> 00:50:04.140 for phacoemulsification of five different U S facilities.

00:50:04.140 --> 00:50:07.260 And you can see a wide range in cost of supplies,

00:50:07.260 --> 00:50:09.410 whether it's kind of the purple stuff on the bottom,

00:50:09.410 --> 00:50:11.480 which are the the single use supplies,

00:50:11.480 --> 00:50:14.210 or if it's drugs or the IOLs, inocula lens

00:50:14.210 --> 00:50:17.810 that they're replacing the cataract with.

00:50:17.810 --> 00:50:21.363 Here's our ovens costs, so much, much smaller of course.

00:50:22.260 --> 00:50:24.310 We wanted to focus a little bit more on the drugs here

00:50:24.310 --> 00:50:27.660 in the U S because it was a contentious point

00:50:27.660 --> 00:50:29.260 for a lot of the surgeons we were talking to,

00:50:29.260 --> 00:50:30.340 may find they were throwing away

00:50:30.340 --> 00:50:33.040 so much of it unnecessarily.

00:50:33.040 --> 00:50:36.960 So we went in to four different medical centers

00:50:36.960 --> 00:50:37.980 in the Northeastern U S,

00:50:37.980 --> 00:50:40.430 and just measured how much of these drugs were thrown out

00:50:40.430 --> 00:50:42.650 after every cataract case.

00:50:42.650 --> 00:50:43.750 And here are our findings, right?

00:50:43.750 --> 00:50:45.110 So the eyedrops in particular,

00:50:45.110 --> 00:50:47.720 were heavily wasted between patients.

00:50:47.720 --> 00:50:49.810 So these are, they'll put a couple drops on a patient's eye

00:50:49.810 --> 00:50:51.640 and then they have to throw out the whole bottle.

00:50:51.640 --> 00:50:53.870 Even if the bottle is labeled as multi-dose,

00:50:53.870 --> 00:50:55.970 as is the case with dilating drops,

00:50:55.970 --> 00:50:58.190 even if the bottle is something that the patients

00:50:58.190 --> 00:51:00.260 would be using after their surgery,

00:51:00.260 --> 00:51:02.520 as this case of antibiotics.

00:51:02.520 --> 00:51:03.943 And you can see for eyedrops,

00:51:03.943 --> 00:51:06.690 that almost 80% of the drugs are thrown out

00:51:06.690 --> 00:51:07.843 at two of our sites.

00:51:09.150 --> 00:51:10.117 This has financial cost, right?

00:51:10.117 --> 00:51:12.930 You pay for those drugs at those two sites

00:51:12.930 --> 00:51:15.940 that threw out the most, that's $190,000 worth of drugs

00:51:15.940 --> 00:51:18.500 to run out each year from cataract surgeries.

00:51:18.500 --> 00:51:21.030 That would pay for an additional 53 cataract surgeries

00:51:21.030 --> 00:51:24.620 at each location, if we somehow didn't throw them out.

00:51:24.620 --> 00:51:26.020 On the environmental side, of course,

00:51:26.020 --> 00:51:29.480 we're manufacturing and delivering these drugs,

00:51:29.480 --> 00:51:31.310 and that has a carbon footprint.

00:51:31.310 --> 00:51:33.040 So the two sites that wasted the most

00:51:33.040 --> 00:51:37.750 are throwing out about 105,000 metric tons of CO2 unused.

00:51:37.750 --> 00:51:40.930 We've already admitted those and we're not even using them.

00:51:40.930 --> 00:51:43.350 That's like driving a car between Alaska and Florida,

00:51:43.350 --> 00:51:45.290 51,000 times a year.

00:51:45.290 --> 00:51:46.920 And these are just like a single site.

00:51:46.920 --> 00:51:48.040 That's throwing away these drugs

00:51:48.040 --> 00:51:49.730 in their cataract surgeries.

00:51:49.730 --> 00:51:51.780 So there's a lot of waste happening here.

00:51:52.750 --> 00:51:54.780 This led us to conduct a national survey, right?

00:51:54.780 --> 00:51:58.230 We're wondering if what we're observing in our surgeons

00:51:58.230 --> 00:51:59.180 is universally true,

00:51:59.180 --> 00:52:00.520 where they're frustrated with the amount of waste.

00:52:00.520 --> 00:52:02.740 So we surveyed

00:52:02.740 --> 00:52:06.210 members of the top four ophthalmological societies,

00:52:06.210 --> 00:52:07.921 and had about 5%

00:52:07.921 --> 00:52:12.190 of the U S ophthalmological population respond.

00:52:12.190 --> 00:52:13.220 And the major conclusion,

00:52:13.220 --> 00:52:15.450 is yes, they're concerned about climate change.

00:52:15.450 --> 00:52:17.050 Yes, they're concerned about how much trash

00:52:17.050 --> 00:52:19.320 is generated in the operating rooms.

00:52:19.320 --> 00:52:21.850 We asked them very specific questions about what drugs

00:52:21.850 --> 00:52:25.520 or supplies they would consider reusing or multi-using.

00:52:25.520 --> 00:52:27.277 And there was actually a surprising number

00:52:27.277 --> 00:52:29.230 who were comfortable with that,

00:52:29.230 --> 00:52:32.330 that they would prefer reusable over disposable.

00:52:32.330 --> 00:52:35.480 But they felt that there was too many regulatory barriers

00:52:35.480 --> 00:52:38.630 to doing so, is a liability issue more than anything else.

00:52:38.630 --> 00:52:40.560 So they wanted more discretion to reuse,

00:52:40.560 --> 00:52:42.220 and they also wanted manufacturers

00:52:42.220 --> 00:52:45.310 to do more to consider the carbon footprint.

00:52:45.310 --> 00:52:47.260 So these are some really interesting takeaways

00:52:47.260 --> 00:52:50.330 that led for two of the ophthalmological sites

00:52:50.330 --> 00:52:52.600 to join the medical society consortium

00:52:52.600 --> 00:52:53.860 on climate and health.

00:52:53.860 --> 00:52:56.040 So they're engaging a little bit more

00:52:56.040 --> 00:52:58.240 on this political side.

00:52:58.240 --> 00:53:00.130 So overall, what I love for you to take away

00:53:00.130 --> 00:53:01.600 from this particular presentation

00:53:01.600 --> 00:53:04.210 is that low resource settings may be a great place

00:53:04.210 --> 00:53:06.060 to look for more efficient resource use.

00:53:06.060 --> 00:53:08.050 And the surgeries are conducted all over the world.

00:53:08.050 --> 00:53:10.670 There are sites globally that are doing this very well,

00:53:10.670 --> 00:53:13.610 but with a very different resource use profile.

00:53:13.610 --> 00:53:15.920 Not every place can afford to throw away supplies

00:53:15.920 --> 00:53:17.380 like we do here in the U S.

00:53:17.380 --> 00:53:19.400 And so if you're looking for ways to change that,

00:53:19.400 --> 00:53:21.923 there are great examples already out there.

00:53:23.660 --> 00:53:25.720 And I think another of this

00:53:25.720 --> 00:53:29.080 is that we're all individually passionate about this,

00:53:29.080 --> 00:53:32.660 but at some point we have to build this up to a larger level

00:53:32.660 --> 00:53:34.170 and engaging with your professional societies

00:53:34.170 --> 00:53:37.020 is a great way to leverage those collective voices.

00:53:37.020 --> 00:53:38.360 It helps to gather the data of course,

00:53:38.360 --> 00:53:42.150 to have carbon footprinting data, perhaps even surveys

00:53:42.150 --> 00:53:44.640 to show how widespread this interest is.

00:53:44.640 --> 00:53:46.170 But engaging those professionals societies

00:53:46.170 --> 00:53:51.000 is a really great way to try to create political change

00:53:51.000 --> 00:53:52.620 much more quickly.

00:53:52.620 --> 00:53:53.860 And finally, I like to say this,

00:53:53.860 --> 00:53:57.600 'cause a lot of physicians are a little anti-industry

00:53:57.600 --> 00:53:58.560 and I can understand why.

00:53:58.560 --> 00:54:01.650 But industry is part of this puzzle as well.

00:54:01.650 --> 00:54:03.440 So the people who manufacture these devices

00:54:03.440 --> 00:54:05.030 also set the instructions for use

00:54:05.030 --> 00:54:06.660 and influence regulation on them.

00:54:06.660 --> 00:54:07.940 And you're not gonna change the system

00:54:07.940 --> 00:54:10.190 without engaging industry as well.

00:54:10.190 --> 00:54:11.820 So these are some of the major things

00:54:11.820 --> 00:54:15.350 that I think could really help any specialty

00:54:15.350 --> 00:54:17.340 who's looking to change their carbon footprint

00:54:17.340 --> 00:54:20.300 and make health care more clinically sustainable.

00:54:20.300 --> 00:54:23.740 So I have a few funding support shown here,

00:54:23.740 --> 00:54:24.890 that I'd like to thank,

00:54:25.820 --> 00:54:28.390 and of course, lots of research partners.

00:54:28.390 --> 00:54:29.280 So I will leave it at that.

00:54:29.280 --> 00:54:32.650 If you do have any questions, please feel free to email me.

00:54:32.650 --> 00:54:34.900 I may be on maternity leave for the next few months,

00:54:34.900 --> 00:54:36.750 but I will try to get back to you.

00:54:36.750 --> 00:54:37.583 Thank you.

00:54:43.900 --> 00:54:46.540 - Fantastic, and apologies again

00:54:46.540 --> 00:54:50.790 for not having Dr. Cassandra Thiel in person with us,

00:54:50.790 --> 00:54:52.240 but we are very grateful

00:54:52.240 --> 00:54:55.190 that she was able to do that ahead of time.

00:54:55.190 --> 00:54:58.790 All right, so as we close out the session here,

00:54:58.790 --> 00:55:03.790 we really only have a short moment to do a Q&A.

00:55:06.470 --> 00:55:09.960 And so I want to open up the question

00:55:09.960 --> 00:55:11.990 for maybe a 60 second answer

00:55:11.990 --> 00:55:14.683 for each of our panelists on the line.

00:55:15.610 --> 00:55:17.250 How have you been able

00:55:17.250 --> 00:55:21.070 to incorporate environmental sustainability

00:55:21.070 --> 00:55:25.660 into your relationships with patients or colleagues,

00:55:25.660 --> 00:55:28.920 to really spread this as part of the culture

00:55:28.920 --> 00:55:30.100 within your health system,

00:55:30.100 --> 00:55:32.730 or roles with other organizations?

00:55:32.730 --> 00:55:35.140 So that culture and that relationship component.

00:55:35.140 --> 00:55:36.743 Maybe 60 seconds each.

00:55:39.030 --> 00:55:41.450 - I'm happy to go first.

00:55:41.450 --> 00:55:42.700 As an anesthesiologist,

00:55:42.700 --> 00:55:46.180 it's less a conversation I have with my patients.

00:55:46.180 --> 00:55:48.750 It's just not something that comes up.

00:55:48.750 --> 00:55:50.940 But I have it every single day with my colleagues.

00:55:50.940 --> 00:55:53.470 And basically my observation

00:55:53.470 --> 00:55:55.340 is driven every single research question

00:55:55.340 --> 00:55:56.340 that I've addressed.

00:55:58.685 --> 00:56:01.420 Just as an example, the question about reusable

00:56:01.420 --> 00:56:03.600 versus disposable laryngoscopes that came about

00:56:03.600 --> 00:56:05.130 because there was a sweeping trend

00:56:05.130 --> 00:56:07.010 toward disposable laryngoscopes

00:56:07.010 --> 00:56:09.150 that was (indistinct) evidence-based.

00:56:09.150 --> 00:56:12.510 It came from a loophole in the regulations,

00:56:12.510 --> 00:56:16.500 and how it was interpreted by the joint commission.

00:56:16.500 --> 00:56:18.530 And so after doing,

00:56:18.530 --> 00:56:23.280 not only LCA looking at the emissions and costs,

00:56:23.280 --> 00:56:25.740 we also, I also had to do a careful review

00:56:25.740 --> 00:56:27.120 in the infection control literature,

00:56:27.120 --> 00:56:30.330 and there was nothing to substantiate the transition.

00:56:30.330 --> 00:56:31.730 So that has been an ongoing battle.

00:56:31.730 --> 00:56:34.720 And that is just one device out of thousands.

00:56:34.720 --> 00:56:36.150 But as a conversation I have every day,

00:56:36.150 --> 00:56:38.650 I work in a teaching institution every day.

00:56:38.650 --> 00:56:43.040 My residents are drilled on both resource conservation

00:56:43.040 --> 00:56:45.210 and environmental preferable practices,

00:56:45.210 --> 00:56:47.570 where we have data in my specialty

00:56:47.570 --> 00:56:49.610 because of my research collaborations.

00:56:49.610 --> 00:56:50.780 We have a lot of information,

00:56:50.780 --> 00:56:52.780 but that's not true of many specialties.

00:56:55.120 --> 00:56:56.890 - Thank you Dr. Sherman

00:56:56.890 --> 00:56:57.723 - I would add

00:56:57.723 --> 00:57:00.850 that it's challenging in the emergency department

00:57:00.850 --> 00:57:03.620 to have long conversations about topics

00:57:03.620 --> 00:57:07.370 that are not directly germane to the care at hand,

00:57:07.370 --> 00:57:10.720 but with my patients, certainly patients

00:57:10.720 --> 00:57:13.520 who come in with asthma exacerbations,

00:57:13.520 --> 00:57:17.920 or respiratory illnesses, or heat exposure,

00:57:17.920 --> 00:57:19.890 or plenty of other conditions,

00:57:19.890 --> 00:57:21.920 I'll frequently mentioned that;

00:57:21.920 --> 00:57:24.170 if you're wondering why this is happening,

00:57:24.170 --> 00:57:27.170 allergens are a lot worse now than they used to be.

00:57:27.170 --> 00:57:31.280 And heat exposure is an important factor.

00:57:31.280 --> 00:57:33.200 And then certainly with my colleagues,

00:57:33.200 --> 00:57:36.170 both on the clinical side and the administrative side,

00:57:36.170 --> 00:57:39.890 I have conversations at least daily

00:57:39.890 --> 00:57:43.590 about the environmental impact that we have

00:57:43.590 --> 00:57:45.340 and how it's harming our patients.

00:57:45.340 --> 00:57:48.423 So it's a big factor in our clinical care.

00:57:50.910 --> 00:57:53.173 - Thank you so much Dr. Slutzman.

00:57:54.020 --> 00:57:57.480 So as we wrap up here together everyone,

00:57:57.480 --> 00:57:59.220 I just wanna share gratitude again

00:57:59.220 --> 00:58:01.120 for my colleague Dr. Amy Collins,

00:58:01.120 --> 00:58:03.140 in the preparation for this session;

00:58:03.140 --> 00:58:05.120 of course, our presenters today;

00:58:05.120 --> 00:58:07.850 Dr. Jodi Sherman, Dr. Jonathan Slutzman

00:58:07.850 --> 00:58:09.640 and Dr. Cassandra Thiel.

00:58:09.640 --> 00:58:11.430 And if you're interested in learning more,

00:58:11.430 --> 00:58:13.920 check out these websites and resources,

00:58:13.920 --> 00:58:15.770 especially the Physician Network

00:58:15.770 --> 00:58:17.703 and the Nurses Climate Challenge.

00:58:18.838 --> 00:58:20.420 And as a reminder,

00:58:20.420 --> 00:58:23.210 this session will be posted on the website linked below.

00:58:23.210 --> 00:58:25.950 And if you have further questions after this session,

00:58:25.950 --> 00:58:28.190 feel free to reach out to either myself

00:58:28.190 --> 00:58:29.973 or Dr. Amy Collins.

00:58:30.810 --> 00:58:32.350 Thank you again for joining us

00:58:32.350 --> 00:58:34.927 all during this challenging time in health care,

00:58:34.927 --> 00:58:38.260 and we are so grateful to have so many allies in this work.

00:58:38.260 --> 00:58:42.330 Stay safe, stay healthy, and thank you all.

00:58:42.330 --> 00:58:43.163 Bye now.