

July 25, 2022



CTS INSPIRATIONS

CTS NEWS

President's Message

Dear CTS members:

I hope that you are taking the summer to relax and enjoy with family, friends, and colleagues. I would like to take this opportunity to bring to your attention an important initiative from the American Lung Association in California. In partnership with ALA, CTS is proud to endorse the Clean Air Act ballot. Please take a moment to learn more about it here and show your support: <https://yeson30.org/>



Clean Air California - Californians Deserve Clean Air

California is seeing more extreme heat, prolonged droughts and catastrophic wildfires. 2020 and 2021 were the worst wildfire years on record in California, burning nearly 7 million acres, taking lives, destroying property and ruining the air quality throughout the state.

yeson30.org

CTS is especially excited to provide ongoing education on topics related to advancing education in pulmonary, critical care, and sleep medicine. These educational series are scheduled on Fridays, please watch for email announcements regarding topics and speakers. Soon, we hope to be able to provide CME credits for the Friday educational series. For those of you who are interested in learning or updating your knowledge and skills on cardiopulmonary exercise testing (CPET) - The Lundquist Institute for Biomedical Innovation at Harbor-UCLA Medical Center is offering a state-of-the-art course from 9/29/22-10/1/22, "A Practicum: Cardiopulmonary Exercise Testing and Interpretation". Please see detailed information below.

Warmly,

A handwritten signature in black ink that reads "Michelle Cao".

Michelle Cao, DO
Stanford University

The Lundquist Institute for Biomedical Innovation at Harbor-UCLA Medical Center is offering a state-of-the-art course from 9/29/22-10/1/22.

Click on the following link for more information and registration:

https://labs.dgsom.ucla.edu/rossiter/pages/exercise_practicum

A Practicum: Cardiopulmonary Exercise Testing and Interpretation

About the Practicum The Practicum was inaugurated in 1982 by Drs. Karlman Wasserman and Brian J. Whipp in response to requests for practical instruction in cardiopulmonary exercise testing (CPET).

labs.dgsom.ucla.edu

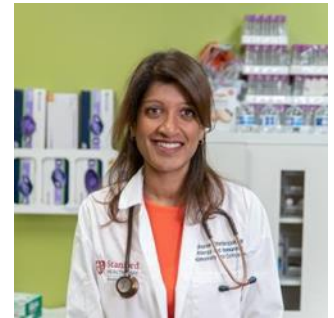
EDITOR'S NOTE

<https://calthoracic.org/california-wildfires-2018-disaster-guidance/>

Over the last 5 years since we published the 1st edition of our Wildfires Disaster Guidance, Wildfires have evolved from being a seasonal event to a year round threat. Fires have become more intense, capable of creating their own weather. <https://www.latimes.com/california/story/2022-08-03/the-mckinney-fire-has-hit-the-stratosphere> As plume heights expand, so does the exposure to fine particulate pollution (PM2.5) which is linked to asthma and other chronic lung diseases. As Dr. Chinthrajah notes below, Climate change has arrived and is already changing our lives, damaging our health. All of us need to act, please check out the information on the Clean Air Act in Dr. Cao's message.

Climate Change Health Effects and What You Can Do

R. Sharon Chinthrajah, MD
Associate Professor of Medicine, Stanford University
Director, Clinical Translational Research Unit at the Sean N. Parker Center
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Allergy/Immunology
Pulmonary/Critical Care
Departments of Medicine and Pediatrics
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All communities deserve to live in a healthy environment; however, climate change is threatening our environment in multiple ways. This has become painfully apparent in recent years with an increase in wildfires outside of the normal wildfire season. It is crazy to think that there is a 'normal' season to wildfires; this is sadly becoming increasingly prevalent along with other extreme or unusual weather patterns. Climate change affects everyone. Specifically, we talk about its impact on vulnerable populations—children, elderly, pregnant women, poor people, especially during short bursts of poor air quality. As a pulmonologist, I see an increase in respiratory and cardiovascular events in the periods during and immediately following poor air quality days. But the reality is long-term exposure to poor air quality shortens your lifespan and has long lasting effects on our health. As an allergist and immunologist I'm asked every year why allergies are on the rise. In part, rising global temperatures due to climate change extends the pollination cycle in plants, triggering and worsening pollen allergies, and lowering overall air quality. Thus, the Sean N. Parker Center for Allergy and Asthma Research is partnering with world experts from multiple fields to further our understanding of how climate change is affecting our health and to find ways in which we can protect ourselves.

On a personal note, as a mom to two young children, I think about what problems the next generations will face. The time for action is now. This starts with educating our patients and colleagues about how climate change affects our daily lives, and how we as individuals can reduce our carbon footprint—use less plastic, eat less meat, rethink our commute, and modes of transportation. However, the burdens of climate change falls more heavily on some, including the poor who often live in areas with higher exposure to pollution. As a society, we need to shoulder these burdens equally, and extra steps need to be taken to protect those who are disproportionately affected by climate change. As such, we are committed to finding solutions to bring a healthy environment for everyone.

Climate Change Health Effects and What You Can Do

Climate change is a change in the normal climate conditions, such as temperature and rainfall, in an area over a period of time. Climate change is caused by the greenhouse gas effect. The greenhouse gas effect is when greenhouse gases (such as carbon dioxide, methane, nitrous oxide, ozone) in Earth's atmosphere block heat from escaping, making the Earth warmer. There are a lot of factors that contribute to the Earth's climate, but scientists agree that Earth has been getting warmer in the past 100 years because of human activities that produce greenhouse gases. Some of these activities include burning fuel, driving cars, and power plants. The effects of climate change include greater fluxes in temperature and rainfall, and more frequent and severe heat waves, wildland fires, droughts, thunderstorms, flooding, and hurricanes. Climate change can also affect our health. This fact sheet discusses causes of climate change and its impact as well as ways we can help limit these problems.

Mental Health

- Extreme heat can increase mood and behavioral disorders in people with mental illnesses and in elderly people.
- Major weather events (ex., floods, wildland fires) are linked with depression, anxiety, post-traumatic stress disorder (PTSD), and substance abuse.

Lungs

- Dust storms and wildfire smoke can increase inflammatory responses and exacerbate asthma.
- Air pollution can contribute to onset and exacerbation of asthma, allergic rhinitis, atopic dermatitis, and contact dermatitis.

Heart and Blood

- Air pollution exposure is linked to heart and blood vessel problems such as high blood pressure, heart attacks, cardiac arrhythmias, and ischemic stroke.
- Air pollution exposure early in life can increase risk for harmful cardiopulmonary effects in childhood.

How Can Climate Change Impact Your Health?

Immunity and Allergy

- Greenhouse gases increase pollen levels and spread.
- Inhaling air pollutants may allow for allergen particles to get into your airways more easily.
- Poor air quality can increase your susceptibility to respiratory infections.

Germs and Spread of Infection

- Longer warm seasons allow for more disease from infections spread by insects (ex., West Nile virus) and rodents (ex., leptospirosis).
- Heavy rains and storm runoff increase the spread of waterborne pathogens (ex. Cholera, Cryptosporidium), which can contaminate water and lead to intestinal problems such as diarrhea.

Human activity contributing to climate change

Climate change has been worsened by population growth and the use of fossil fuels (gasoline, oil, natural gas), with activities including:

- Heavy use of burning (combustible) fuels (such as coal, oil, natural gas)
- Exhaust fumes from cars, trucks, and other forms of transportation
- Methane gases from animals grown as food and farm equipment combustion
- Increased industrial production
- Release of carbon dioxide through deforestation and wildfires
- Emissions from industrial grade fertilizers and agricultural practices
- Decomposition and burning of waste at landfills

Who is Most Vulnerable to the Health Effects of Climate Change?

Everyone is at risk of having health problems from climate change, but some groups have higher exposure to factors that increase their risk.

- Children breathe more air and drink more water per body weight than adults, while still growing and developing their immune systems. They tend to spend more time outdoors and have more exposure to elements in the air.
- Pregnant women experience many changes that make them more vulnerable to extreme temperatures and dehydration. Extreme heat and air pollution are linked with negative birth outcomes for the developing baby, such as preterm birth (early delivery) and low birth weight.
- Elderly people have more fragile immune systems, often have other health conditions, and may have limited mobility.
- Low-income communities have less access to resources to evacuate in times of emergencies. They have increased exposure to environmental factors such as air pollution that are linked to poorer health outcomes.
- Communities of color, including indigenous people and immigrants, experience health disparities because of structural racism and may also have cultural barriers, including language barriers.
- Certain occupational groups may also face increased risks because of where they work and what type of work they do. For example, extreme weather conditions can affect outdoor workers. Extreme heat can impact indoor workers who work in already hot indoor workplaces.

What Can I do to Avoid Health Problems From Climate Change?

Reduce your risk of health effects by being prepared for climate events.

- Have an emergency plan, including contact numbers, equipment, medications, and food (www.ready.gov)
- Keep up to date on climate events in your area by checking local alerts for storm, heat, and high air pollution. AirNow reports local air quality using the Air Quality Index, a color-coded index that tells you whether air quality is healthy or unhealthy for you (see www.airnow.gov). Smoke Sense is a mobile app by the EPA that lets you know the current and future Air Quality Index and wildland fires in your area.

For extreme heat

- Each spring, check your household's fans, air conditioners, and other cooling equipment to make sure they are working properly. Know the location of your nearest cooling center(s).

- If you work outdoors or in a physically demanding job without air conditioning, take frequent breaks and make sure you drink enough water. Encourage your employer to develop a heat response plan.

Air pollution and wildfires

- Avoid rigorous exercise outdoors on high air pollution days or during wildfires
- When outdoor air pollution levels are very high, stay indoors with windows and doors closed, and close fresh intake on air conditioning units
- Consider using an indoor air cleaner with a high-efficiency particulate air (HEPA) filter

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Resources:

For health impacts related to climate change:

Centers for Disease Control and Prevention (CDC)

- *Climate Effects on Health:*
www.cdc.gov/climateandhealth/effects/
- *"Preparing for the Regional Health Impacts of Climate Change in the United States."*
www.cdc.gov/climateandhealth/docs/Health_Impacts_Climate_Change-508_final.pdf

American Lung Association

- Climate Change and Lung Health
www.lung.org/clean-air/climate-change/climate-change-lung-health

U.S. Environmental Protection Agency

- *Climate Change and Health Factsheets:*
19january2017snapshot.epa.gov/climate-impacts/climate-change-and-health-factsheets_.html
- *Climate Impacts on Human Health:*
19january2017snapshot.epa.gov/climate-impacts/climate-impacts-human-health_.html

American Thoracic Society

- *Patient Resources*
www.thoracic.org/patients/patient-resources/fact-sheets-az.php

For helping my community limit climate change:

Vote for bills and representatives that will act against climate change

Write a letter to your representative

- *How to Write a Letter to Congress—Citizen's Climate:*
citizensclimatelobby.org/how-to-write-a-letter-to-congress/

Join campaigns and take individual action against climate change—small steps can add up if we all do something!

- *UN Campaign for Individual Action—Toward a net zero future:*
www.un.org/en/actnow
- *Healthy Air Campaign—American Lung Association:*
www.lung.org/policy-advocacy/healthy-air-campaign/about-healthy-air-campaign
- *Get involved 350: A movement to build a world safe from effects of the climate crisis:*
<https://350.org/get-involved/>

This information is a public service of the American Thoracic Society. The content is for educational purposes only. It should not be used as a substitute for the medical advice of one's healthcare provider.

Why is Pulmonary Rehabilitation a Priority in Fibrotic Interstitial Lung Disease?

By Chris Garvey FNP, MSN, MPA, MAACVPR

- Interstitial lung diseases (ILD) are associated with decline in functional capacity, disabling symptoms, and hypoxemia with activity.
- Antifibrotics are associated with reduction in loss of lung function and improved survival in idiopathic pulmonary fibrosis (IPF), yet their impact on overall improvement from baseline in patient-centered outcomes such as functional capacity, quality of life (QOL) and dyspnea is not clear.
- Numerous clinical trials of pulmonary rehabilitation (PR) in ILD demonstrate improved functional capacity, dyspnea and QOL (table 1).
- A recent international retrospective multi-center study of PR in fibrotic ILD identified improved survival and reduced need for lung transplantation in those in whom PR improved six-minute walk distance. Participation in greater than 80% of planned PR sessions was also associated with a lower risk of death.
- Randomized control trials of PR in ILD could present potential ethical challenges due to withholding one of a few effective interventions to those randomized to the usual care control arm.



Pulmonary Rehabilitation is well established as a high value intervention in persons with chronic lung disease. Although most of the evidence of PR effectiveness and safety is derived from studies of persons with COPD, numerous clinical trials in ILD have demonstrated improved functional capacity, dyspnea and quality of life (QOL) in ILD and IPF (table 1).

Fibrotic ILD is characterized by disabling symptoms and decline in physical function. Exertional hypoxemia is common in ILD¹ and often more severe than in COPD.² Severe exertional hypoxemia in those with ILD is associated with a significant increase in mortality³ and independently predicts pulmonary hypertension⁴ and reduced physical activity.⁵ In patients with IPF, antifibrotics have been associated with decreased all-cause mortality with no significant difference between pirfenidone and nintedanib.^{6,7} A pooled analysis of pirfenidone vs. placebo shows less decline in six minute walk distance of treatment vs placebo.⁸ The impact of antifibrotics on overall improvement from baseline in patient-centered outcomes such as functional capacity, QOL and dyspnea is not clear.⁹⁻¹¹

A recent retrospective international multi-center trial by Guler¹² and colleagues assessed the relationship between change in six-minute walk distance (6MWD) seen with rehabilitation and time to death or lung transplant in people with fibrotic ILD. The sample included 701 participants (445 male, 69±12 years old) who attended PR (505 outpatient, 196 inpatient). Improvement in 6MWD following outpatient and inpatient PR exceeded the minimal clinically important difference at 34±65 m (outpatient) and 55±83 m (inpatient). Improvement in 6MWD during PR was associated with lower hazard rates for death or lung transplant on adjusted analysis for both outpatient PR (HR 0.97, 95% CI 0.95 to 1.00, p=0.042) and inpatient (HR per 10 m 0.94, 95% CI 0.91 to 0.97, p<0.001). Participation in ≥80% of planned outpatient PR sessions was associated with a 33% lower risk of death (95% CI 0.49% to 0.92%).

Several clinical trials have demonstrated improved functional capacity, dyspnea and QOL in IPF and other ILDs. A recent Cochrane review of PR in ILD included 16 studies including 356 patients who received PR and 319 who received usual care.¹³ The analysis included 9 studies of IPF, 3 of sarcoidosis, 2 of occupational dust-related ILD, and 8 with a variety of ILDs. The mean age range was 36-72 years. All programs included endurance training, and some included strength training.

Most PR programs were 8-12 weeks in duration with sessions 2-3 times weekly. Following PR, there was significant improvement in functional capacity with a 40 meter improvement in 6MWD as well as improved dyspnea and QOL. A subset of patients with IPF achieved similar benefits. Six to twelve months following PR, 6MWD improvement was 37 meters. No studies described side effects or safety concerns with PR.¹³

The table below is a sample of clinical trials exploring the efficacy of PR in ILD.

Study	Sample	Δ 6MW, m	Dyspnea	QOL
Hanada et al. 2020. J Thor Dis Vol 12, No 3 (March 2020)	14 trials: PR in IPF & ILD	Ex capacity improved (1)	Improved	Improved
Tonelli et al. BMC Pulmo Med 2017	41 ILD	54 m	Improved	Improved
Dowman et al Thorax 2017; 72:610-9. RCT	142 ILD	25 m	Improved	Improved
Ryerson et al Respir Med. 2014 Jan;108(1):203-10	54 ILD	58 m (50 m @ 6 mo.)	Improved	Improved
Kozu et al. Respirology 2011; 16:1196-202	142 ILD	31 m	Improved	N/A
Swigris et al Respir Care 2011;56:783-9	54 ILD	62 m	Fatigue improved	SF36 non sig
Salhi et al Chest. 2010;137 (2): 273-279	142 ILD	107 m	Improved	SGRQ non sig
Ferreira et al .Chest. 2009; 135(2): 442-447	54 ILD	56 m	Improved	N/A
Holland et al RCT Thorax. 2008; 63(6): 549-554	57 ILD	35 m	Improved	Improved
Nishiyama et al RCT Respirology 2008; 13:394-9.	54 ILD	42 m	No change	Improved
Jastrzebski et al J Physiol Pharmacol. 2006; 57: 139-148	142 ILD	N/A	Improved	improved
Naji et al. JCRP. 2006; 26(4): 237 - 243.	26 ILD	N/A	Improved	Improved

1. 6MWD, VO₂ peak, peak work rate, VO₂ max or endurance time.

There are potential ethical and clinical challenges regarding design of randomized clinical trials (RCTs) to assess the impact of PR in ILD. PR is one of few effective treatments available for this population. It may be deemed to be ethically unacceptable to deny or delay PR in ILD in those randomized to usual care.

Looking back at the evolution of the role of PR in ILD, it is worth noting that the 2011 ATS IPF statement recommendations describe: "The majority of patients with IPF should be treated with PR, but PR may not be reasonable in a minority (weak recommendation, low-quality evidence): This recommendation places a high value on moderate-quality data demonstrating improvement in functional status and patient-centered outcomes and a low value on cost and uncertainty regarding duration of benefit."¹⁴

The evidence for efficacy for PR in ILD and IPF has grown significantly since this statement with a number of publications and greater evidence of long term improved functional capacity following PR. The study by Guler and colleagues is an important window into impact of PR in fibrotic ILD beyond function, dyspnea and QOL, and will hopefully lay the groundwork for further investigation into strategies that may impact survival.

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Meet Nicholas Kolaitis, MD, MAS CTS Board of Director Member



Nicholas Kolaitis, MD, MAS

CTS Chair of the Career Development Committee
Assistant Clinical Professor of Medicine
UCSF San Francisco, CA

What's your story?

I am a transplant pulmonologist and specialist in pulmonary hypertension at UCSF. I also serve the CTS as the chair of the Career Development Committee.

What are you passionate about?

I love dogs and have two rescues. One was adopted when I was a resident and he was in the Los Angeles Shelter for 1.5 years before I got him. The other came from a farm in South Korea which raised dogs for human consumption.

What in your life currently makes you feel the most fulfilled?

Being a father, I have a 12 month old daughter who fills my world with joy and happiness.

Who is your personal hero?

My mother, who is now a retired Professor from the San Francisco State University School of Business. She came to the US to pursue higher education at a time when women were not in academia. She pursued a PhD and broke through barriers so that the generations of women who came after her would have an easier time in Academia.

What is your dream job?

The one I have. It is an incredible gift to practice medicine in a place like UCSF. I especially love being a part of the lung transplant team where we can be so heavily involved in changing the trajectory of a person's life.

Have you read any good books?

During the 2020 election I read What Unites Us by Dan Rather. I loved reading such a powerful narrative in a time of divisiveness across our country.

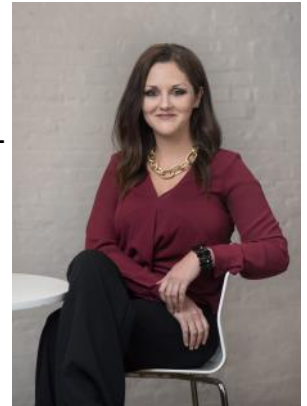


CSRC

By Krystal Craddock MSRC, RRT, RRT-NPS, AE-C, CCM

CSRC Annual Conference: Successful Live Event

Since COVID hit the U.S. in February 2020, professional gatherings across the nation were canceled and then held virtually. However, with vaccines and PPE safety measures organizations like CTS and the CSRC have been able to reunite with old colleagues, network with new ones, and learn from experts in our field. This past June, the CSRC was able to hold its annual state conference in Temecula which kicked off with a full Board of Directors (BOD) meeting, three days of learning, and concluded with the Respiratory Care Board (RCB) of California's meeting open to the public. The theme of the conference this year was "California Dreamin".



There were several highlights of the annual conference. The BOD meeting that took place the afternoon before the conference included approval of the CSRC's election process to bring in our newly elected board members and appointments. The morning of the conference started with the live Ethics Course followed by the CSRC President's State of the State address and awards ceremony. During the three-day event, there were several speakers addressing topics relevant for clinicians today, including active shooter preparation, less- and non-invasive monitor of CO₂, Electronic Impedance Tomography, asthma guideline updates, pediatric ventilator management, pediatric drowning, pulmonary rehab, organ procurement and the RT, and a presentation on successful succession planning.

A wildly popular and fan-favorite highlight returned at the annual conference—the Sputum Bowl Competition! Teams of students from different respiratory care programs answered challenging physiologic, pharmacologic, mechanical, and physics questions related to the field of respiratory care. This year's Sputum Bowl winners were from San Joaquin Valley College, Ontario. The CSRC is grateful to be able to safely hold live events once again and are appreciative of our program committee working to assure all in attendance are not only gaining necessary knowledge but are also doing it safely with COVID protocols in place to decrease infection risk and spread. Our next event will be the San Diego Regions annual "Day at the Races" held at the Del Mar Racetrack on August 4th.



CSRC full Board of Directors. These are both elected officials, committee and program chairs, and Liaisons who volunteer their time to commit to the field of respiratory care and the CSRC organization.



Live Ethics Course in the morning of day 1 facilitated by Katie Sobato who is the Education Chair for the CSRC. This is a great way for Respiratory Care Practitioners to meet their ethics requirement while also interacting and meeting others in the field.



CSRC President Wayne Walls delivering the annual State of the State address prior to giving out awards on day 1 of the conference.



President Wayne Walls presents the prestigious CSRC Presidents Award to Jolene Burgess. Jolene is the CSRC Treasurer and Respiratory Care Manager at Enloe Medical Center in Chico, CA.



2022 Sputum Bowl winners from San Juan Valley College, Ontario. This competition is for teams of students from different respiratory care programs where they are challenged answering physiologic, pharmacologic, and physics questions related to the field. Every team has a creative name associated with respiratory care. This team's name was "Tick and Tenacious", fitting for Sputum Bowl!

Southwest Journal of Pulmonary, Critical Care and Sleep Volume 24 Issues 5 & 6

SWJPCCS Volume 24 Issues 5 & 6							
Title (Click on title to open the manuscript)	Journal Section	First Author	Year	Vol	Issue	Pages	Date Posted
Electrotonic-Cigarette or Vaping Product Use Associated Lung Injury: Diagnosis of Exclusion	Pulmonary	Mahdi AA	2022	24	6	96-100	6/21/22
June 2022 Medical Image of the Month: A Hard Image to Swallow	Imaging	Carrillo A	2022	24	6	93-95	6/2/22
June 2022 Pulmonary Case of the Month: A Hard Nut to Crack	Pulmonary	Gergen D	2022	24	6	89-92	6/1/22
Assessing Depression and Suicidality Among Recently Unemployed Persons with Obstructive Sleep Apnea and Socioeconomic Inequality	Sleep	Singh V	2022	24	5	81-88	5/16/22
Medical School Faculty Have Been Propping Up Academic Medical Centers, But Now Its Squeezing Their Education and Research Bottom Lines	Editorials	Robbins RA	2022	24	5	78-80	5/5/22
Bacteremia and Native Mitral Valve Endocarditis	Critical Care	Mahdi AA	2022	24	5	74-7	5/4/22
May 2022 Medical Image of the Month: Pectus Excavatum	Imaging	Barber C	2022	24	5	72-3	5/2/22
May 2022 Imaging Case of the Month: Asymmetric Apical Opacity–Diagnostic Considerations	Imaging	Gotway MB	2022	24	5	64-71	5/1/22
April 2022 Medical Image of the Month: COVID Pericarditis							

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