Climate Change: Managing Health Impacts in Your Practice

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Caroline Wellbery, MD

Family Physician, Department of Family Medicine, Georgetown University School of Medicine, Washington, DC; Associate Deputy Editor, American Family Physician

Dr. Wellbery earned a doctorate in comparative literature from Stanford University, California, and earned her medical degree from the University of California, San Francisco. She completed her family medicine residency at Community Hospital in Santa Rosa, California, followed by a medical editing fellowship at Georgetown University School of Medicine, which launched her multi-decade career as an editor of American Family Physician (AFP). Board certified in family medicine, Dr. Wellbery currently holds a position that spans medical education, residency teaching, and scholarship. She has published extensively in academic journals, such as the Journal of the American Medical Association (JAMA), Academic Medicine, and the New England Journal of Medicine (NEJM), on a variety of topics that include her interest in the medical humanities, clinical medicine, and the clinical impacts of climate change. She is co-author of the forthcoming AFP article The Changing Climate: Managing Health Impacts and has successfully pioneered the integration of climate change modules into Georgetown’s preclinical curriculum.
Matthew Burke, MD, FAAFP

Faculty Physician, Inova, Arlington, Virginia

Dr. Burke earned his undergraduate degree at Dartmouth College in Hanover, New Hampshire, and his medical degree at Albany Medical College in New York. After completing his residency training through Brown University at Memorial Hospital of Rhode Island in Pawtucket, he completed a Primary Care Health Policy Fellowship at Georgetown University, Washington, DC. He has strong interests in health policy and public health, especially regarding social determinants and health equity. Dr. Burke is the chair of the AAFP’s newly formed Climate Change and Environmental Health Member Interest Group (MIG). From 2016 to 2017, he served on the AAFP Board of Directors as a new physician representative.

Jonathan Temte, MD, PhD

Professor, Madison Family Medicine Residency Program, University of Wisconsin (UW)

Dr. Temte earned his medical degree from the UW School of Medicine and Public Health (formerly UW-Madison Medical School) and completed his family medicine residency at the Madison Family Medicine Residency, where he is now a professor. He teaches family medicine residents and provides full-spectrum primary care for an underserved, diverse community at Wingra Family Medical Center in Madison, Wisconsin. In 2015, he completed his tenure as chair of the U.S. Advisory Committee on Immunization Practices (ACIP), being the first family physician to serve in this capacity. From 2004-2008, he served as AAFP liaison to the ACIP. He was appointed twice to a four-year term as a voting member of the ACIP and chaired ACIP working groups on MMRV safety, evidence-based recommendations, and the MMR vaccine. Dr. Temte represented the AAFP at the Centers for Disease Control and Prevention’s (CDC’s) Measles Elimination Meeting in 2000 and the Rubella and CRS Elimination Meeting in 2004, and he chaired the AAFP Commission on Science in 2008. He currently chairs the Wisconsin Council on Immunization Practices (WCIP) and is the principal investigator for the Wisconsin Acute Respiratory Infection Epidemiology and Surveillance (ARIES) project; the Oregon Child Absenteeism due to Respiratory Disease Study (ORCHARDS); and the Rapid Assessment of and Prophylaxis for Influenza in Dwellers of Long-Term Care Facilities (RAPID-LTCF) project. In addition, he has participated on pandemic influenza and bioterrorism working groups for the state of Wisconsin. His current research interests include viral disease surveillance in primary care and communities, seasonality and epidemiology of influenza, and attitudes toward immunization.
Learning Objectives

1. Recognize the causes and impacts of climate change and their implications for health.

2. Implement clinical strategies to prevent and treat morbidities caused, or exacerbated by climate change-related conditions.

3. Implement ameliorative strategies at the patient, practice and policy level.

Audience Engagement System

Step 1

Step 2

Step 3
Six Americas Quiz

- Go to shorturl.at/lKOU3
- Once you have answered the 4 questions, you will be entered into one of 6 categories. Remember your category for later in this presentation! You will be asked to enter your category in a poll question.

Climate change is one of the greatest threats to health America has ever faced—it is a true public health emergency.

--U.S. Call to Action on Climate, Health and Equity: A Policy Action Agenda
Section 1 What is climate change?

Recognize the causes and impacts of climate change and their implications for health

It was a very hot day
So what? What does this have to do with climate change?

Athletes are a population vulnerable to heat

- Logan: “August of 2010 proved to be a record-setting summer of heat”
- Richard: “heat and blistering sun on race day”
- Mark: “I was not prepared for 70+ minutes of burning sunshine”

Many causes: dehydration, lack of conditioning, coaching culture

But: without hot days, no heat injury

Individual Impact: Heat Exhaustion and Heat Stroke

- Exhaustion (37-40C)
  - Symptoms: nausea, headache, dizziness, weakness, anorexia
  - Signs: anxiety, confusion cutaneous flushing, oliguria, tachycardia, vomiting

- Stroke (40C+) Symptoms: (same)
  - Signs: mental status changes, arrhythmia, pulmonary edema, hepatic failure, DIC, hyperventilation

System impacts: heat has broad reach

- Air pollution
- Increased energy consumption
- Water quality; impact on aquatic life
- Warming oceans
- Ice melt
- Adverse effects on agriculture
- Drought
- Extreme weather events

Individual health to climate health: connecting the dots

Individual factors, contextual factors, environmental factors
  - Individual: vulnerable (and even healthy) persons
  - Contextual: where you live, how many resources you have
  - Environmental: the changing climate

Climate-related illnesses: can’t tease out from other factors, BUT…
Hot days are coming to a reality near you


Poll Question 1

Most planetary warming has occurred during our lifetime.
A. True
B. False
True!

Should we be worried?

Heat Wave Season Length in 50 Large U.S. Cities, 1961-2017

Change in length of season, in days

Adapted from: https://www.globalchange.gov/browse/indicators/us-heat-waves
Heat Wave Frequency in 50 Large U.S. Cities, 1961-2017

Change in number of heat waves per year

Adapted from: https://www.globalchange.gov/browse/indicators/us-heat-waves

10 Hottest Years since 1880

Adapted from: http://www.climatecentral.org/gallery/graphics/the-10-hottest-global-years-on-record (accessed 6/17/19)
Global temperature change 1880-2018

We Just Breached the 415 PPM Threshold for CO2

- [https://climate.nasa.gov/vital-signs/carbon-dioxide/](https://climate.nasa.gov/vital-signs/carbon-dioxide/)

--

![CO2 graph](image)

Data source: Reconstruction from ice cores. Credit: NOAA

![CO2 graph](image)

Data source: Monthly measurements (average seasonal cycle removed). Credit: NOAA
Greenhouse effect: CO2 & other gases

Greenhouse gases trap heat. More GHG=more heat

Separating Human and Natural Influences on Climate

- Observations
- Natural and Human Factors
- Natural Factors Only

Global Temperature Change (°F)
US Greenhouse Gases 2017

• CO2—82%
• Methane 10%
• Nitrous oxide 6%
• Fluorinated gases 3%


• Largest source of emissions comes from burning fossil fuels for:
  • Transportation
  • Electricity
  • Heat

Health Care Emissions per Expenditure Category (2013)

Top 5 Categories:
1. Hospital Care
2. Physician and Clinical Services
3. Prescription Drugs
4. Structures and Equipment
5. Nursing Care Facilities & Continuing Care


Emissions in the clinical workplace

• **Health care contributed 9-10% of the total greenhouse gas emissions in the US in 2013 (Eckelman and Sherman 2018)**

• A majority of the emissions are from suppliers of energy, goods, and services (Eckelman and Sherman 2016)
  - Hospital care(36%)
  - Physician and clinical services services (12%)
  - Prescription drugs (not including anesthetic gases) (10%)

Thinking outside of the box

Everything is connected but complex!
The role of the (family) physician

• Citizen: climate change includes health sector but also many other disciplinary dimensions
• Advocate: trusted individual
• Expert: can address intensified respiratory, allergic, mental health and preventive strategies
• Healer: Focus on well-being and healthy communities

Section 2 Human Health Harms of a Changing Climate: What Family Physicians Should Know
Learning Objectives

• Recognize the causes and impacts of climate change and their implications for health
• Implement clinical strategies to prevent and treat morbidities caused, or exacerbated by climate change-related conditions

Human Health Harms

• Climate is changing NOW
• Negative impacts for human health
• Few positive ones
• Effects are disproportionately felt by the vulnerable (children, elderly, sick, poor)
Respiratory/Allergy


Spring Coming Sooner (everywhere)
Air Quality

Air pollution is a major threat to human health, posing immediate and delayed effects on the respiratory, cardiac and other systems.

- In 1948, 28 people died outside Pittsburgh from a 5 days smog event requiring the shutdown of the local plant (albeit for 1 day)
- In 1952, 4,000 people died in the London Fog, a combination of fossil fuel burning and meteorological conditions. 8,000 more would die in the subsequent months

Asthma Rates

Source: CDC (accessed 6/9/19): [https://www.cdc.gov/vitalsigns/asthma/index.html](https://www.cdc.gov/vitalsigns/asthma/index.html)
Air Quality

• Investigations of the Donora smog lead to the Clean Air Act (1963) a precursor to the formation the EPA in 1970.
  Regulatory authority given over
  • Carbon dioxide
  • Ozone
  • Lead
  • Nitrogen dioxide
  • Sulfur dioxide
  • Other particulates

• By 2020, EPA estimates suggest $65B cost to industry but save $2T in health costs

Air Quality

• CO2 is harmless to human health (at atmospheric concentrations) but is not the only gas produced by fossil fuel burning

• Nitrous oxide, sulfur based chemical and ozone are all direct irritants to human respiratory epithelium

• Particulate Matter directly affects cardiopulmonary systems

Source: Circulation, AHA, 2004
Air Quality- Ozone

• Ozone is a powerful oxidizing agent, combines with a host of particulate and organic gases to cause respiratory damage (mediated through inflammatory responses)
  • Exacerbated during warm weather
  • Asthmatics, elderly and preexisting pulmonary disease are risk factors

Clinical Intervention

• Be aware of high risk patients advise outdoor exposure and exertion on high risk days
• Have action plans for all asthmatics
• Empower patients with up to date air quality information
• AFP has articles with great resources

Source: CDC, EPH Tracking Data, 2014
Poll Question 2

• Climate Change threatens to worsen the impacts of all of the following natural disasters EXCEPT:
  • a. Earthquakes
  • b. Coastal flooding
  • c. Hurricane strength
  • d. Both increased drought and precipitation
Natural Disasters

- Highly destructive, difficult to fully prepare for (though effects can be mitigated)
- Flooding more common with changes in precipitation\(^1\)
- Hurricanes more powerful with warming waters, more destructive with sea rise\(^2\)
- Earthquakes unaffected
- Tornadoes are possibly affected but link unclear\(^3\)
- Wildfires

Advisory: Patients to have disaster plans, especially if in prone areas\(^4\)

2. NASA. [https://earthobservatory.nasa.gov/Features/RisingCost/rising_cost5.php](https://earthobservatory.nasa.gov/Features/RisingCost/rising_cost5.php)
3. Center for Climate and Energy Solutions. [https://www.c2es.org/content/tornadoes-and-climate-change/](https://www.c2es.org/content/tornadoes-and-climate-change/)

Infectious Disease
Arthropod Borne Disease

- Expansion of mosquito borne disease
  - Yellow Fever
  - Dengue
  - Zika
  - West Nile
  - Malaria
- Expansion of tick borne disease
  - Lyme
  - Rickettsial disease


Water Borne Disease

Many water borne disease are temperature and salinity dependent, factors that will be exacerbated with warming climate (Vibrio sp, salmonella, campylobacter, etc.)

Clinical Intervention

- Have a heightened sense of suspicion about previously rare infectious diseases
- Be familiar with lab processes for ordering tests, testing parameters (e.g., Lyme)
- Recommend common sense measures
  - Long sleeves
  - Avoid outdoor exposure at dusk/dawn
  - Remove standing water sources around the home

Agriculture
Agriculture

• But CO2 is plant food, right?
• $400 billion in productivity annually in US1
• C4 to C3 exchange happens (corn would get edged out by less nutritious grasses)
• Reduced total biomass
• Studies show a -10% precipitation results from 1.5-2.5°C temp increase, causing -30-40% crop yield2
  • Plants grow faster but are less nutritious (lower protein contents)
• Drought, flood are perturbations from natural cycles that alter or retard plant growth
• Food shortages exacerbated by low crop yields have been implicated as a contributor to the Arab Spring (and political turmoil across an entire region of the globe)
• Plant based diets are increasingly linked to longevity and smaller carbon footprints


Psychologic
Psychologic

• Climate change has the potential for increasing frequency and severity of depression and anxiety

• Univ. of AZ study has categorized domains of psychogenic stress
  • Egoistic: concern for self (worsening asthma, home lost in flood)
  • Altruistic: concern for others (grandparent in a heat wave, refugees)
  • Biospheric: concern for planet, other species (loss of biodiversity)


Psychologic

• Numerous studies link heat to violent crime and intergroup violence

• Increased heat and reduced precipitation have been implicated in numerous major world events (Mongol raids, fall of Ming dynasty, Arab Spring, ISIS expansion in sub Saharan Africa)

• 1°C temp rise linked to 0.7% (US) and 2.1% (Mexico) rise in suicide rate

• 1SD +/- in rainfall resulted in 6.1/9.2% violent events in African study

• Regularly screen patients for depression and anxiety

• Empower individuals to take action to combat climate change - collective action offers optimistic vision of future

2. Journal of Peace Research (49)1, 2012
Section 3 Clinical Responses to Climate Change Health Effects

Jonathan L. Temte, MD/PhD
Associate Dean for Public Health and Community Engagement
Professor of Family Medicine and Community Health
University of Wisconsin School of Medicine and Public Health

Learning Objectives

• Implement clinical strategies to prevent and treat morbidities caused, or exacerbated by climate change-related conditions
Subjective: XXXXXXX is a 34 year old male who presents today for follow-up on weight loss medications, skin eruptions, and chronic pain issues. Please refer to our previous visit from 4/15/2016 for additional details. At our last visit, we discussed lichen simplex chronicus and continued on phentermine.

Today, XXXXXXX reports that he is starting to lose weight again and that the phentermine helps in this. He is consuming less salt and fat, and despite fatigue, is getting activity.

His skin is doing better after seeing a Native American medicine man. He is using a combination of aloe vera and activated charcoal on his skin and the lesions are all healing. There are still lesions to the buttocks and to a lesser extent, on his forehead. He uses 90% rubbing alcohol, then washes with tea tree oil body wash daily. He dries his skin carefully and uses gauze in gluteal cleft. He also tries to have a lot of exposure to open air.

He expresses significant stresses: (1) girlfriend’s illness, (2) his parents are moving into his house in XXXXXXX, (3) recent flooding in SW Wisconsin

Assessment:
(1) Anxiety with depression
   Family, business, social, climate change
(2) Low WBCs and platelets
(3) Colon cancer screening

Clinic Note: 9/27/2016 – J. Temte
Clinic Note: 5/28/2019 – J. Temte
First and Foremost:
Be a Family Doctor

• Acute Care
• Chronic Disease Management
• Preventive Care
• Maternal Care
• Child and Adolescent Care
• Geriatric Care
• Behavioral Health
• Education
• Community and Public Health
• Advocacy


Capitalize in Trust

• 2001 Study
• Evaluating family practice patient attitudes toward environmental issues
• HIGH Trust in Doctor
• LOW Utilization of Doctor

Capitalize in Trust

• 2017 Study
• Evaluating family practice patient attitudes toward climate change
• HIGH Trust in Doctor
• LOW Utilization of Doctor

Boland TM, Temte JL. Family medicine patient and physician attitudes toward climate change and health in Wisconsin. Wilderness and Environmental Medicine 2019 [in revision]

Poll Question 3

• Compared to walking, how much more CO2 is produced by driving a typical car?
  a. 2 times more
  b. 4 times more
  c. 10 times more
  d. 20 times more
Transportation

- Driving 1 mile: 404-440 gms of CO₂

- Walking 1 mile: 20 gm CO₂

- Biking 1 mile: 9 gm CO₂

Benefits from Movement

- Reliance on private motorized vehicles can also be a major contributor to sedentary lifestyles, obesity and an 3.2 million deaths a year

- Increased active travel could reduce CO₂ emissions and reduce:
  - ischemic heart disease
  - cerebrovascular disease
  - depression
  - Alzheimer’s disease
  - Diabetes
  - breast cancer
  - colon cancer


Poll question 4

- The elimination of which dietary products most significantly LOWERS your carbon footprint:
  - a. Dairy
  - b. Poultry
  - c. Red Meat
  - d. Seafood
  - e. Vegetables

Consumption

- Eating all locally grown food for 1 year
  - saves the equivalent of driving 1,000 miles
- Eating a vegetarian meal 1 day a week for 1 year
  - saves the equivalent of driving 1,160 miles
- Switching to less carbon intensive meats can major impacts
  - Replacing all beef consumption with chicken for one year reduces CO₂ by 882 lbs
- Organic food typically requires 30-50% less energy during production
  - one-third more hours of human labor, making it more expensive.

Choice of Foods

Data source: University of Michigan Center for Sustainable Systems – Carbon Footprint Factsheet: [http://css.umich.edu/factsheets/carbon-footprint-factsheet](http://css.umich.edu/factsheets/carbon-footprint-factsheet) Photo: Creative Commons

Food in the Anthropocene:

EAT–Lancet Commission on healthy diets from sustainable food systems

“The Commission’s definition of a healthy reference diet was calculated through analysis of food groups, with appropriate ranges proposed for essential daily intake that would lead to optimal health and wellbeing and to reducing premature deaths worldwide by 19–23%. The dietary shift that is needed requires a dramatic reduction of consumption of unhealthy foods, such as red meat, by at least 50%, with a recommended daily combined intake of 14 g (in a range that suggests total meat consumption of no more than 28 g/day), with variations in the change required according to region. At the same time, an overall increase in consumption of more than 100% is needed for legumes, nuts, fruit, and vegetables, with the changes needed again varying according to region.”

Benefits from Diet

- Livestock products are a source of saturated fat
  - a known risk factor for cardiovascular disease
- A 30% reduction in livestock production is needed
  - for 50% reduction in CO2 by 2030
- Modeling the potential benefits of reduced consumption of livestock products on the burden of ischemic heart disease
  - decreased by about 15% in the UK
  - decreased by about 16% in São Paulo city
- Although likely to yield health benefits
  - this will encounter cultural, political, and commercial resistance


Greening the Medical Practice

- Healthcare buildings are among the most energy intensive of facilities
  - LEED, or Leadership in Energy and Environmental Design, certification
  - Location near population centers / neighborhoods
    - Walking and biking
    - Alternative energy sources
- e-Visits
- Home visits
- School-based clinics

Twelve Actions for Family Physicians
(ranked by level of impact on climate)

• #4  Plant Rich Food
• #6  Educating Girls
• #7  Family Planning
• #37  Mass Transit
• #44  LED Commercial Lighting
• #45  Building Automation
• #54  Walkable Cities
• #56  Industrial Recycling
• #57  Smart Thermostats
• #59  Bike Infrastructure
• #70  Paper Recycling
• #75  Ridesharing

Section 4 Getting Involved: The big picture

Learning objectives

• Implement ameliorative strategies at the patient, practice and policy level

Part 1. Climate change communication: the challenge (Dr. Wellbery)

Climate change and partisanship
Economics
Threat to personal autonomy
Conspiracy theories
SASSY Quiz

• How important is the issue of Global Warming to you personally?
• How worried are you about GW?
• How much do you think GW will harm you personally?
• How much do you think GW will harm future generations?

https://climatecommunication.yale.edu/visualizations-data/sassy/

“Six americas”

• Alarmed=29%
• Concerned=30%
• Cautious=17%
• Disengaged=5%
• Doubtful=9%
• Dismissive9%
Top 10 Voter Priorities for 2010

Priority Topic

% Rating as a "Top Priority"

83 81 80 66 65 63 60 57 53 49 49 49 49 45 45 44 42 40 36 32 28

Data from 11 national surveys (n=13,103) from Dec. 2013 to Dec. 2018. Difference scores are calculated before rounding (example: 30.3% - 28.7% = 1.6% which, after rounding, would appear in the figure as 30% - 29% = 1%).
Who worries most about climate change?

- 61% registered voters
- 93% of liberal Democrats
- 81% of moderate/conservative Democrats
- 54% of liberal/moderate Republicans
- 21% conservative Republicans
Physician-scientists as communicators

- Physician surveys suggest higher degree of belief in climate change & concern about climate change health effects
- Medical students: higher belief, interest in learning more
- High rate of trust: trust in doctors higher than other sources

Finding the right words

<table>
<thead>
<tr>
<th>AVOID</th>
<th>Instead</th>
</tr>
</thead>
<tbody>
<tr>
<td>Climate change, climate crisis, climate risk, global warming</td>
<td>Damage to our environment</td>
</tr>
<tr>
<td>Renewable energy, green energy, domestic energy</td>
<td>Homegrown; renewable clean energy</td>
</tr>
<tr>
<td>Good for the country</td>
<td>Better for our families, our children</td>
</tr>
<tr>
<td>Today, we rely on fossil fuels/We have relied on dirty energy</td>
<td>Dirty fossil fuels; dirty energy We use...</td>
</tr>
<tr>
<td>Scientists agree</td>
<td>We need rules and fines</td>
</tr>
<tr>
<td>Don't endanger our health by burning fuel</td>
<td>Care for ourselves; care for our health</td>
</tr>
<tr>
<td>Stop/mitigate/slow down climate change</td>
<td>Our prosperity depends on [our action]</td>
</tr>
<tr>
<td>We can</td>
<td>We should</td>
</tr>
</tbody>
</table>
Telling the right story

• Minimal emphasis on all the dangers and threats (people will tune out)
• Major emphasis on patients and families in the here and now (make it personal)
• Positive messages outlining local solutions
• Use of trusted sources (such as respected health care organizations)

Messaging Building blocks

• Start with people stay with people
• Connect around common values
• Acknowledge ambivalence
• Make it real
• Emphasize solutions
• Inspire and empower
• End with advice/ask
Messaging Examples

• When the American Lung Association tells us that toxic pollution in the air we breathe is affecting the health of nearly half of all Americans, we need new solutions.
• We can walk or bike more often to improve our fitness while cutting down on pollution.
• Kids seem to carry inhalers almost as often as lunch boxes. We can use safe, clean energy, like wind and solar, that helps make every breath we take a healthy one.

Advocacy: from language to action

• It’s not all doom and gloom!
• Docs can recognize signs of these illnesses, be prepared for increased incidence and burden of disease
• Physicians have a strong voice, especially when advocating for patients and the public health

Part 2: Advocacy & Policy
US Renewable Energy (Dr. Burke)

US remains dependent on non-renewable sources at present

- 82,000 MW installed wind capacity (2.7% total, but more than ¼ of installed capacity in 2017)
- 50,000 MW installed solar capacity (1.7% total)

Ways to Get Involved with AAFP

• State academy lobby days
  • Propose action based on existing bills or make your own; focus on the public health benefit
• State Legislative Conference
  • Request to present successes achieved from above or through other work
• Influence national Advocacy Summit
  • Petition for more public health agenda items
• Join the new Climate Change and Environmental Health MIG
Family Medicine Interest Groups

• AAFP: Climate Members Interest Group
  • Building out the AAFP’s climate education materials
  • Prepping resolutions on:
    • divestment
    • expanding AAFP climate policy
• NAPCRG
  • Climate Change and Health Special Interest Group
    • Research agenda
• STFM
  • Primary Care and Public Health Integration Collaborative

“Health care systems are composed of numerous individuals, all of whom have the opportunity and perhaps the moral obligation to act.”

Outside Organizations

• Citizens Climate Lobby
  • Non partisan
  • Major goal currently to move to carbon dividends
  • Organized by local chapters
    • https://citizensclimatelobby.org/
• Physicians for Social Responsibility
  • DC based
  • Focused on nuclear weapons and climate change
  • “prevent what we cannot cure”
  • Also organized by local chapters
    • https://www.psr.org/issues/environment-health/
State Based Work

- Can come in many forms (AAFP, state AFP chapters, Citizens Climate Lobby, etc.)
- May be most fruitful given national political climate (several states have aggressive action currently in play)
- Often easier to get the ear of state officials with whom you may share a small/better known geography

Medical Society Consortium on Climate and Health

- Led by Dr. Mona Sarfaty, family physician from Bethesda, MD
- Based out of George Mason University in Fairfax, VA
- >20 signatory medical membership societies, incl. AAFP, AMA, ACP, AAP (>500,000 MDs)
- Promotes MD awareness of the public health threats of climate change; supports efforts to mitigate these health threats
  - https://medsocietiesforclimatehealth.org
Summary

- Climate change is real, it’s happening now and it’s affecting patients now
- It presents few novel clinical challenges, but is likely to exacerbate numerous conditions (heat related, infections, cardiopulmonary conditions and psychiatric concerns)
- Physicians should have heightened index of suspicion for these events, add to patient awareness (and thereby preparedness)
- Interested physicians would make great advocates for broader changes to enhance the public health

Practice Recommendations

Address climate change-related health impacts as citizen, clinician, advocate and healer

Educate patients on air pollution monitoring, disaster response, heat avoidance, new & emerging infections, allergic disease & advocacy

Use established communication tools in making clinical and community-based health recommendations

Counsel patients on health and environmental co-benefits of active transport/plant-based diets
Questions

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Resources

- The changing climate: Managing Health Impacts *American Family Physician*
- The medical society consortium on climate and health
- Practice Green Health: sustainability solutions for healthcare [https://practicegreenhealth.org/](https://practicegreenhealth.org/)
- Healthcare without harm [https://noharm.org/](https://noharm.org/)