

Health Impacts of Extreme Heat:

A Clinical & Administrative Perspective

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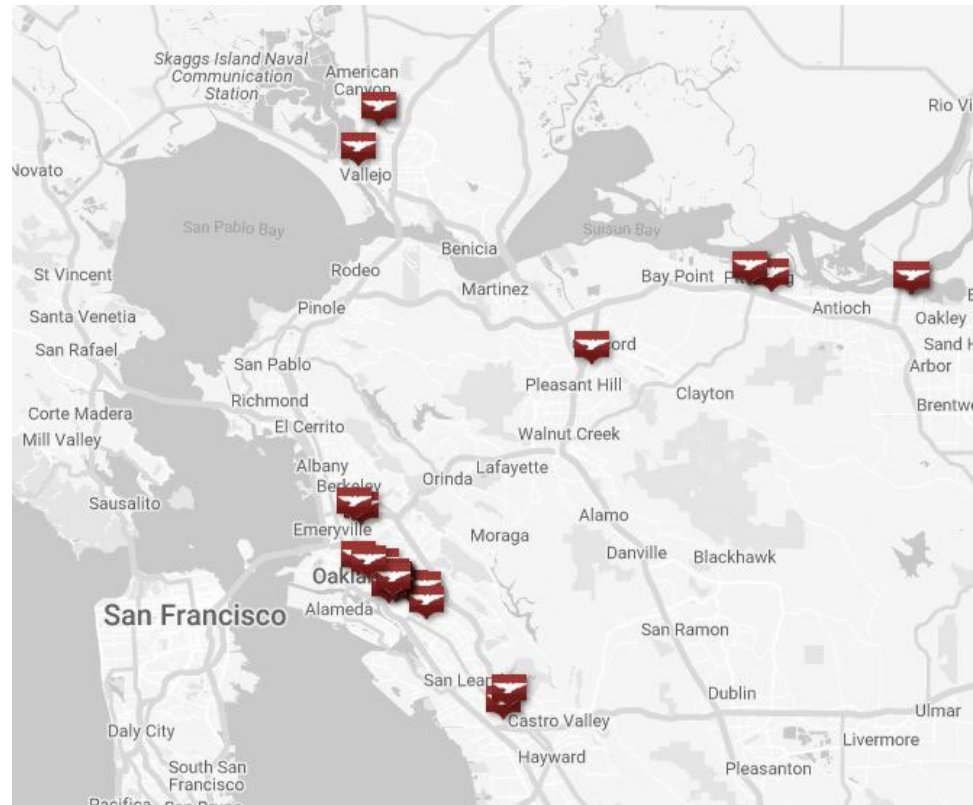


Agenda

- Extreme Heat: Prevalence, Clinical Implications & Interventions
- La Clinica's Climate and Health Working Group
- Advocacy and Networking

La Clinica's Background

- Founded in 1971
- 81,000 patients in 2023
- Services include Medical, Dental, Vision, Behavioral Health, Community Health Education
- 35 service locations in three counties in San Francisco Bay Area, including:
 - Stand-alone primary care facilities
 - Clustered campus settings
 - School-based health centers
 - Mixed-use complexes



La Clinica's Service Area: Heat Waves

SCI
AM

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JULY 1, 2023 | 10 MIN READ

Extreme Heat Is Deadlier Than Hurricanes, Floods and Tornadoes Combined

When dangerous heat waves hit cities, better risk communication could save lives

BY TERRI ADAMS-FULLER



WATCH LIVE

WEATHER

3.5 million Bay Area residents to be under Excessive Heat Watch this weekend, NWS says



By [Drew Tuma](#)

Wednesday, July 12, 2023



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CLIMATE

Extreme Heat Killed 14 People in the Bay Area Last Year. 11 Takeaways From Our Investigation

By [Molly Peterson](#) Oct 17, 2018 [Save Article](#)



Heat Advisory - Far Inland Areas

Tuesday 11 AM through Tuesday 8 PM

Dangerous Heat Inland

- Highs in the mid 90s to low/mid 100s
- Interior portions of the North Bay, East Bay, and Santa Clara county as well as San Benito County and interior Monterey County
- Tuesday late morning through Tuesday evening

Prepare!

- The elderly, sick, and homeless are most vulnerable. Have a way to check up on them!
- Shift/reschedule outdoor activities away from the hottest parts of the day (11am-6pm).

ISSUED: 1:10 PM - Monday, August 15, 2022

weather.gov/bayarea

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SFGATE

[Newsletters](#) [Sign in](#)

'Dangerous heat' forecast to bring temperatures up to 110 to the SF Bay Area

By [Amy Graff](#)
July 13, 2023



La Clinica's Service Area

- Hot inland, cool coasts
- Both present different risks – a population used to cooler temperatures may be less resilient
- Received a grant from CalEPA to send text message-based alerts to high-risk patients on days with extreme heat (2+ consecutive days of >95F) starting in 2022
- Signed up for heat alerts from Harvard C-CHANGE in 2023 which are tailored to be adjusted to the temperatures that the population is accustomed to most recently

Questions to consider:

- What can we do for patients at risk for health impacts from extreme heat?
- What resources exist? What additional resources are needed?
- How might your clinic prepare patients and clinic operations before and during extreme heat events?

Extreme Heat-associated clinical scenarios

- 56yo M with systolic heart failure, hypertension on furosemide (diuretic), losartan, metoprolol with baseline Cr 1.2, diagnosed with acute kidney injury with Cr 1.9 and BUN 45 on labs drawn during heat wave
- 26yo F with epilepsy, stable on levetiracetam with first seizure in 7 years during heat wave
- 47yo F with chronic migraines who works as dishwasher with increased frequency and severity of migraines during high heat days
- 23yo F with depression, anxiety, and volatile interpersonal relationship with increased cutting, citing stress from climate doom and despair over Palestine exacerbating relationship stress

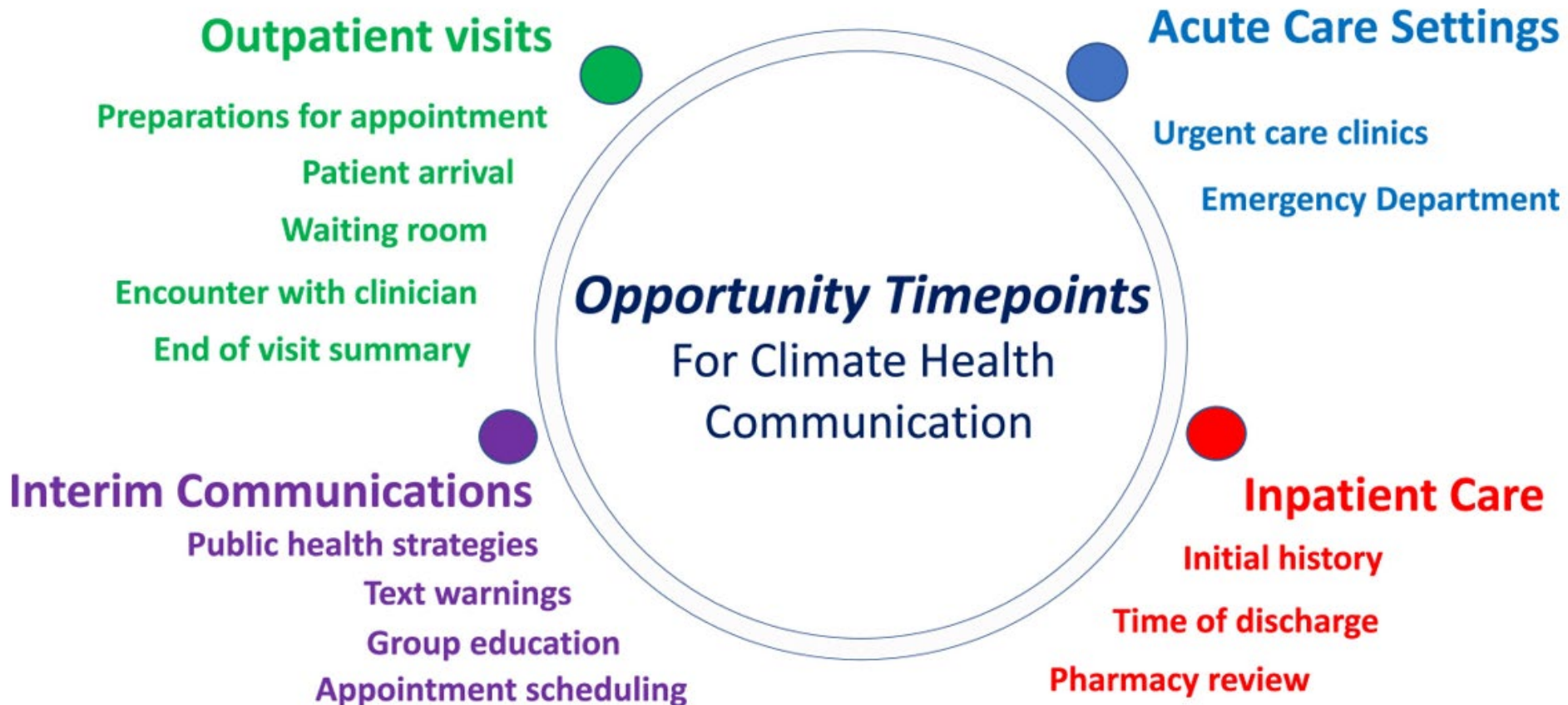
How to address Extreme Heat in clinic?



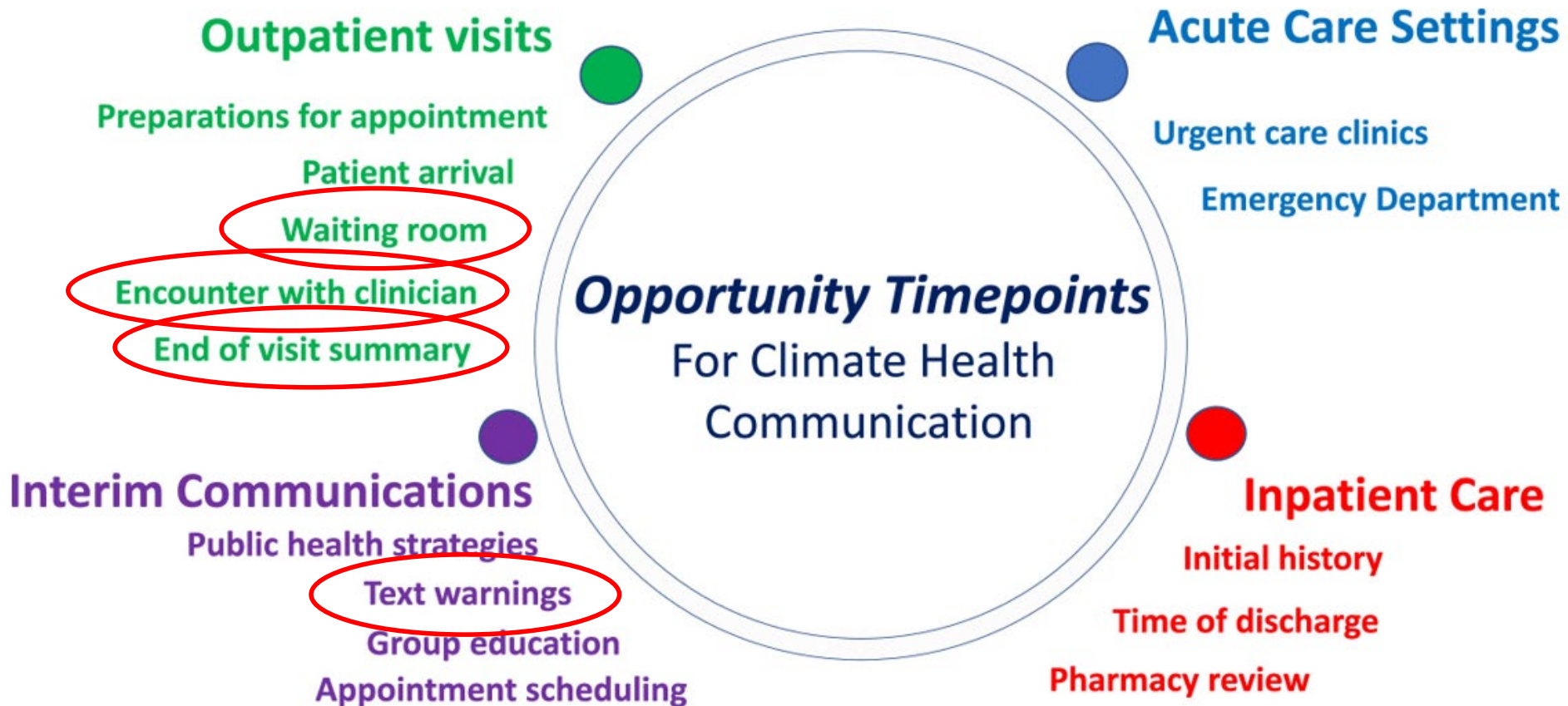
Barriers

- **Time constraints**
- Lack of knowledge of impacts of extreme heat on health for at risk populations by staff and providers
- Lack of streamlined implementation strategies and resources

It's not all on you!



It's not all on you!



Teamwork makes the dream work

- *Never doubt that a small group of thoughtful, committed citizens can change the world. It is the only thing that ever has.*
- Margaret Mead
- *If you want to go fast, go alone. If you want to go far, go together.* - African proverb

∴ La Clinica's climate
& health working group



Text Alerts for Extreme Heat & Poor Air Quality

- CalEPA grant to develop a system to send text alerts to medically high-risk patients on days with poor air quality and extreme heat
- Poor air quality and heat wave posters distributed to clinics
- Developed dotphrase and reminded providers to put into AVS

HOW TO PROTECT YOURSELF FROM POOR AIR QUALITY

Wildfires across California are creating hazardous and smoky conditions. Smoke from the fires may begin to drift into the Bay Area and rapidly reduce air quality. Protect yourself and your loved ones from harmful wildfire smoke:

- 1. Check air quality at www.airnow.gov to know the level of danger where you are.**
- 2. Limit going outside. Limit working and exercise outdoors.**
- 3. If you must work or go outdoors, wear an N95 mask OR doublemask with surgical mask under cloth mask.** Don't use N95 masks in children (under 3) since they may suffocate.
- 4. Don't add more particulate matter to the air by burning anything indoors or vacuuming.** Limit use of stoves, space heaters, or candles. Do not fry or broil meat. Do not smoke.
- 5. Keep windows and doors closed in your home and car.**
- 6. Use air filters in your home to clean the air.**
- 7. Learn how to build one cheaply here: <https://www.instagram.com/p/CFm0GmyWJ/>**

DIY Air Cleaner to Reduce Wildfire Smoke Indoors

Materials

- 20" x 20" x 1" or 4" air filter (High-efficiency HEPA filter)
- 20" x 20" box fan (Only one needed fan with 12 in. x 12 in. opening (200 model or more))
- Clamp
- Shut tape
- Bungee cords

Assembly

1. Attach the air filter to the back of the box fan using either clamps, duct tape or bungee cords.
2. Check the filter for the direction of the air flow (marked on the side of the filter).
3. Replace filters when dirty.

La Clínica.
a california health center

How to Survive a Heatwave

Keep Rooms Cool

- Lower shades to reduce heat
- Maintain cross air ventilation
- Avoid fans if room is >95 degrees as they no longer cool the air

Wear Loose Clothing and a Hat

- Loose cotton (non-synthetic) is best
- Wear a wide-brimmed hat outside

Cool Down with Showers

- Or cool, wet towels

Find Cool Shelter

- Don't heat out "the heat at home"
- Cool down in libraries, malls, movie theaters, and local cooling centers

Take Meds as Prescribed

- BEFORE heat waves, ask your health care provider about any changes to your medications during hot weather

Make a Plan for Help

- BEFORE heat strikes, ask a friend/neighbor to check on you 2x/day
- Seek health care if throbbing headache, dizziness, nausea, or feel confused
- Call 911 for emergencies

Drink Lots of Water

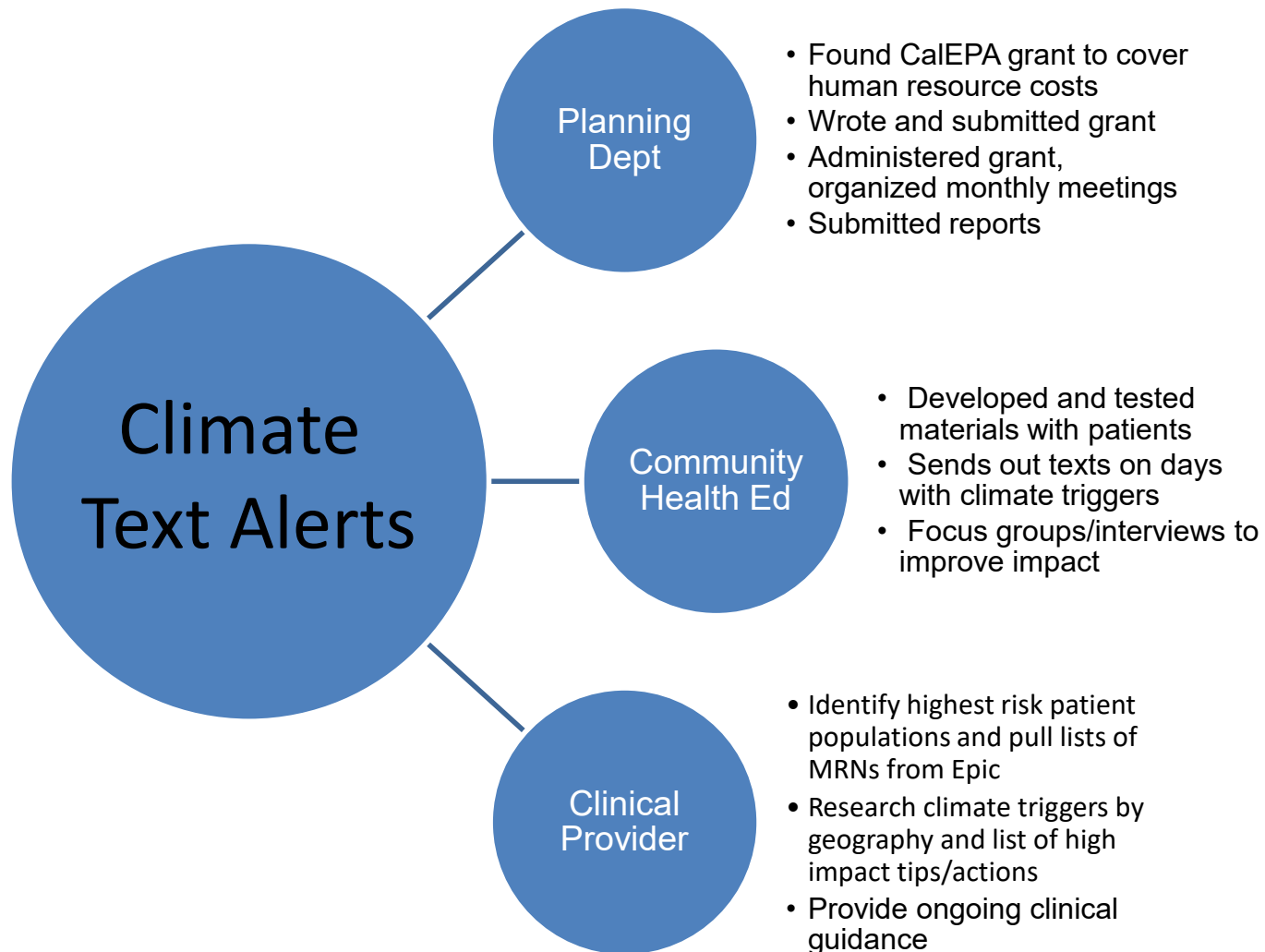
- Hydrate before you feel thirsty
- Avoid alcohol, caffeine, and sugary drinks

Never Leave Kids or Pets in Cars

- Not even for a quick minute
- Cars heat up fast and can kill children and pets

climate psychiatry alliance

To send out a simple text message...



Metrics to Define Extreme Heat Event

- Temperature: Daily maximum temperature is easiest to use practically, though also can measure mean and diurnal temperature difference
- Duration: The minimum number of consecutive days of extreme heat for most definitions varies from 2 to 4 days
- Threshold: Most definitions refer to exceedances above absolute thresholds such as 90°, 95°, 100°, or 105°F or exceedances above relative thresholds such as 95th, 97th, 98th, or 99th percentiles that vary according to the location

Source: Vaidyanathan A, et al. A Statistical Framework to Evaluate Extreme Weather Definitions from Health Perspective. Bull Am Meteorol Soc. 2016 Oct; 97(10): 1817–1830. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5584545>.

ICD Codes of High-Risk Conditions

| | Population | ICD code | ICD |
|------------------|---------------------------------|---|----------------|
| | age: 4y and under, 66y and over | | |
| Pregnancy | | Z34.9 | |
| CKD | | N18.9 | |
| | Stage I | N18.1 | |
| | Stage II | N18.2 | |
| | Stage III | N18.30 | N18.31, N18.32 |
| | Stage IV | N18.4 | |
| | Stage V | N18.5 | |
| | On dialysis | N18.6 | |
| | Due to diabetes | E11.22 | E10.22 |
| | with malignant HTN | I12.9 | I12.0 |
| | with benign HTN | I13.10 | |
| DM | Type 2 | 11.9 | |
| | in pregnancy | O24.919 | O24.911 |
| | Due to underlying condition | E08.9 | |
| | Type 1 | 10.9 | |
| | Type 1 w/complication | E10.59, E10.618, E10.65, E10.649, E10.10, E10.49, E10.39, | |
| | Type 1 w/kidney complication | E10.29 | |
| | Type 2 w/complication | E11.59, E11.618, E11.65, E11.649, E11.10, E11.49, E11.39 | |
| | Type 1 w/kidney complication | E11.29 | |
| | long-term use of insulin | Z79.4 | |
| Asthma | moderate persistent asthma | J45.909 | |
| | mild intermittent asthma | J45.20 | |
| | mild persistent asthma | J45.30 | |
| COPD | | J44.9 | |
| | Pulmonary emphysema | J43.9 | |
| | Centrilobular emphysema | J43.2 | |

Text Alert Examples

Different texts for high risk populations:

1. Patients with CKD, age 65+, DM, CHF, CAD, Hx MI, Hx of CVA: "Health Alert from La Clinica: Due to your medical condition, today's extreme heat increases your risk of dehydration and heat-related illness.

La Clinica recommends you drink plenty of water.

Avoid sugary beverages and alcohol.

Stay cool in an air-conditioned home or cooling shelter, and cover windows with curtains or reflective material."

2. Children < 5 years old: ...Do not bundle or sleep with fluffy or heavy blankets. If younger than 6 months, do NOT give your baby water. Ensure your baby drinks enough breastmilk or formula. Breastfeeding mothers should drink plenty of water. Keep your child cool with wet towels. Stay in an air-conditioned home or cooling shelter. You may also cover windows with curtains or reflective material.

3. Pregnant women: ...Due to being pregnant, today's high temperatures increase your risk of dehydration, preterm contractions, and heat-related illness. To protect you and your baby...

Text Alert Examples

Different text for subsequent days:

- Second consecutive day: "Today is another day of extreme heat. Look out for signs of heat exhaustion, which include: Heavy sweating, paleness, muscle cramps, dizziness, headache, fainting, nausea, vomiting. If you have signs of heat exhaustion, go to a cooler location. Cool down by removing excess clothing, taking sips of water, taking a cool bath or shower, or cooling with wet towels."

Sent out via Artera WELL texting app.

Language based on patient's preferred language as listed in Epic.

We have sent out texts 1-2 days prior to heat waves

A simplified version was also sent to staff via our internal emergency alert system, Everbridge

Outcomes

- Texts sent Summers 2022, 2023, and 2024
 - First summer - 2022: Eastern Contra Costa County (Antioch, Pittsburg)
 - 2608 recipients for extreme heat
 - Second summer - 2023: Contra Costa (Concord, Antioch, Pittsburg) and Solano counties
 - 5871 & 5664 recipients for extreme heat by county
 - Third summer - 2024: Contra Costa (Concord, Antioch, Pittsburg) and Solano counties
 - 9,507 recipients for extreme heat (so far)

Outcomes

- Advertised English and Spanish language focus groups with gift card compensation to get feedback from alert recipients, but in-person events were sparsely attended
 - Pivoted to phone calls to solicit feedback which has been more successful
 - Overall, the feedback has been very positive:
 - Trust La Clinica > government or other authorities
 - Language & reading level appropriate
 - Useful information recipients were unaware of

Opportunities and actions

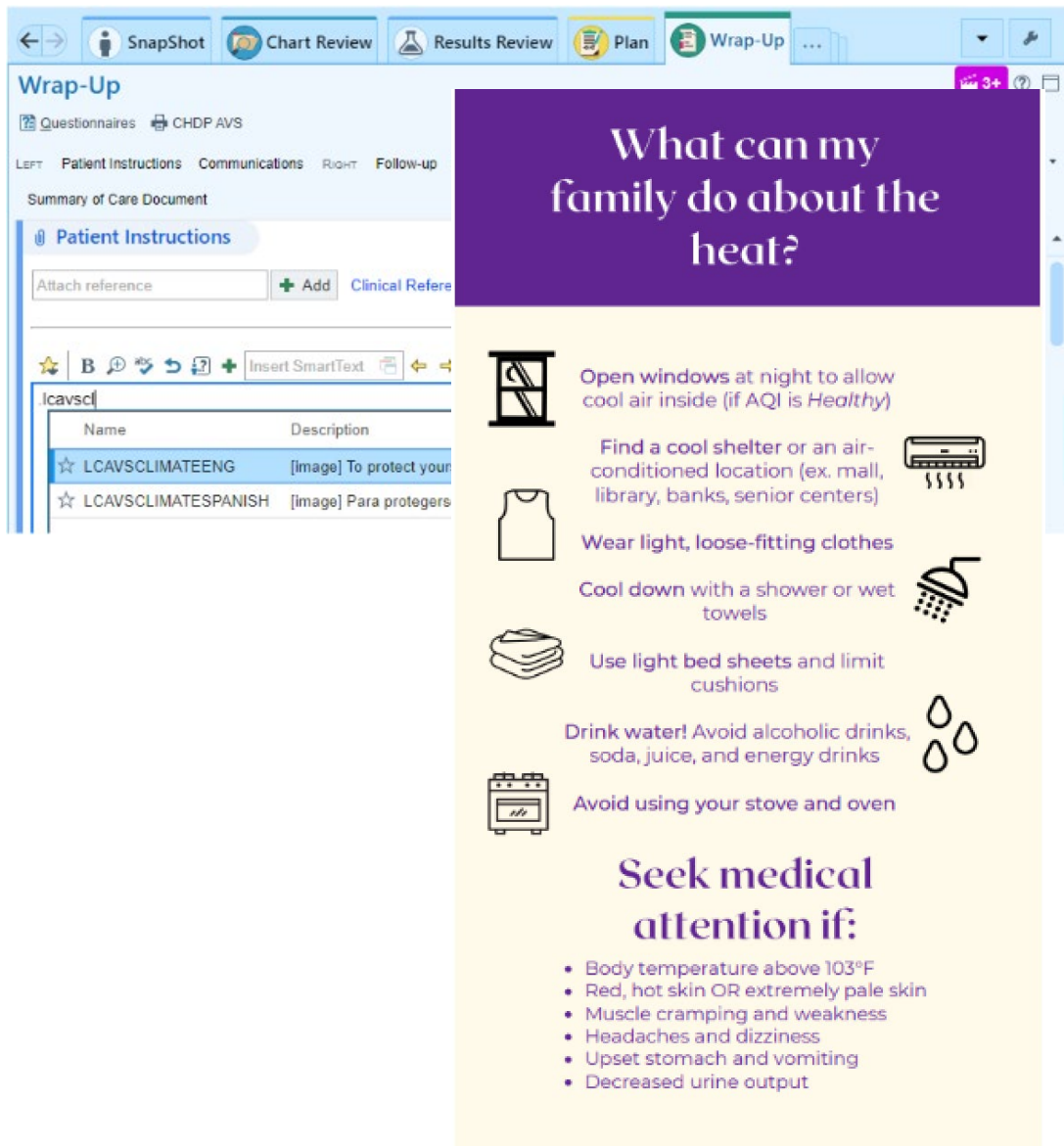
Proactive prevention

- Seasonal anticipatory guidance
 - Starting late spring, caution patients about upcoming summer extreme climate events and how to check AQI/weather, how to prepare their homes (e.g. air filters)
- "Climate shock" events: Opportunities to educate & develop action plans
 - Text alerts to general or specific populations
 - Inform patients about their individual health risks with regard to climate events: Behavior modifications, individualized action plans, red flag symptoms, medication adjustments and storage

Reactive prevention








- Individual "health shock" events: Opportunities for a teachable moment to motivate change in behavior
 - E.g., Explicitly linking the worsened kidney function to dehydration, which they are at greater risk of on days with extreme heat
- Equip and Empower
 - Text & clinic appts: "Drink water, not soda/juice. Use a wet towel to cool down. Continue to take diuretics. Avoid salt. If you feel dizzy or lightheaded AND have a measured low blood pressure below 100/60, do not take the "water pill" or diuretic that day"

Dotphrases with climate mitigation/adaptation information



The screenshot shows a medical software interface with a 'Wrap-Up' tab selected. The main content area displays a purple header with the text 'What can my family do about the heat?'. Below this, there are several icons and corresponding text instructions for heat mitigation. At the bottom, there is a section titled 'Seek medical attention if:' followed by a list of symptoms.

What can my family do about the heat?

-  Open windows at night to allow cool air inside (if AQI is Healthy)
-  Find a cool shelter or an air-conditioned location (ex. mall, library, banks, senior centers)
-  Wear light, loose-fitting clothes
-  Cool down with a shower or wet towels
-  Use light bed sheets and limit cushions
-  Drink water! Avoid alcoholic drinks, soda, juice, and energy drinks
-  Avoid using your stove and oven

Seek medical attention if:

- Body temperature above 103°F
- Red, hot skin OR extremely pale skin
- Muscle cramping and weakness
- Headaches and dizziness
- Upset stomach and vomiting
- Decreased urine output

To protect yourself and your family from extreme heat:

- Drink plenty of water, even if you don't feel thirsty, to decrease your risk of dehydration.
- Avoid sugary beverages and alcohol, because they can cause dehydration.
- Wear loose-fitting, light-colored clothes.
- Cool down with wet towels or a cool shower
- Stay in a cool, air-conditioned area. For available cooling centers, visit links below.
- Check in on neighbors, friends, and elderly family members to make sure they are cool and hydrated.
- Reschedule outdoor activities for later in the day when it is cooler.
- Avoid strenuous outdoor activity, such as exercise or manual labor, during the hottest parts of the day. If you must be outside, be sure to wear a hat and sunscreen, wear light & loose-fitting clothing, take frequent breaks in a shaded space
- If needing to work in a hot environment, adults should aim to drink 1 cup of water (8 oz) every 20 minutes, for a total of 24 oz every hour. If children are in a warm place or outdoors, they should drink 4 oz every 20 minutes.
- Never leave pets or children in a parked car, even if the windows are open.
- Avoid using your oven.
- Block the sun from entering your home by closing shades and curtains during the day, or using reflective material in the windows

For patients who are on diuretics:

Continue to take diuretics. Avoid salt. If you feel dizzy or lightheaded AND have a measured low blood pressure below 100/60, do not take the "water pill" or diuretic that day

For patients who are on dialysis:

Evaporative cooling is more important than drinking excess water. Cool down by using wet towels, taking cool showers, putting hands and feet in cool water.

For patients who use insulin or other medications that need to be refrigerated prior to opening:

If temperatures are above 100 degrees outdoors, we recommend keeping medication in the fridge alongside unopened medication.

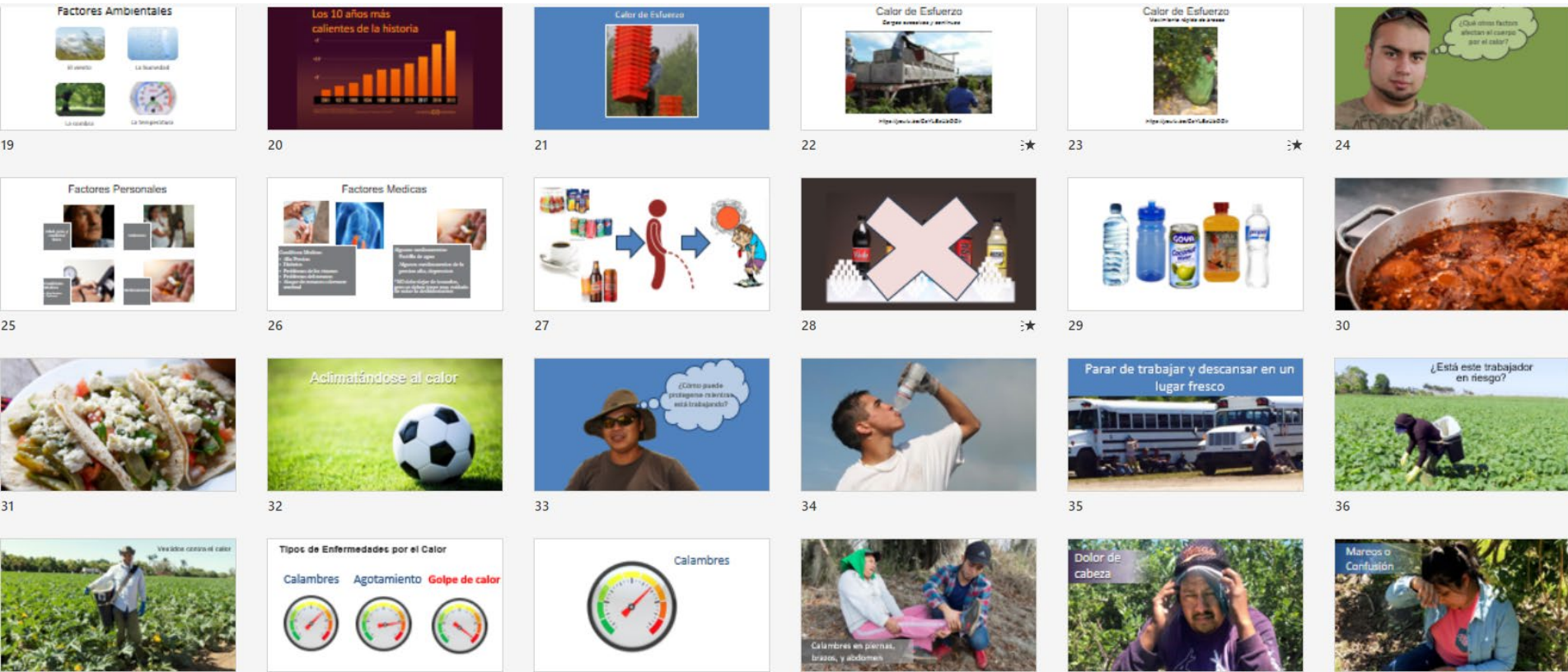
Where to find cooling centers in:

Alameda County- <https://veoci.com/v/p/dashboard/ewxv8granu>
 Contra Costa County- <https://www.contracosta.ca.gov/civicalerts.aspx?aid=3065>
 Solano County- https://www.solanocounty.com/depts/oes/cooling_centers.asp

| Diagnoses | | | |
|-----------|--|-------------|--|
| ID | Name | IMO Clin... | ICD-10 Codes |
| 3167... | Environmental allergies | | Z91.09- Other allergy status, other than to drugs and biolog... |
| 1145... | Environmental and seasonal allergies | | J30.89- Other allergic rhinitis |
| 1145... | Environmental asthma | | J45.909- Unspecified asthma, uncomplicated |
| 1685... | Environmental exposure | | T75.89XA- Other specified effects of external causes, initial e... |
| 3284... | Environmental exposure to algae bloom | | Z77.121- Contact with and (suspected) exposure to harmful ... |
| 3199... | Environmental exposure to blue-green algae bloom | | Z77.121- Contact with and (suspected) exposure to harmful ... |
| 3200... | Environmental exposure to brown tide | | Z77.121- Contact with and (suspected) exposure to harmful ... |
| 3199... | Environmental exposure to cyanobacteria bloom | | Z77.121- Contact with and (suspected) exposure to harmful ... |
| 3281... | Environmental exposure to Florida red tide | | Z77.121- Contact with and (suspected) exposure to harmful ... |
| 3585... | Environmental exposure to harmful algae and toxins | Preferred | Z77.121- Contact with and (suspected) exposure to harmful ... |
| 3284... | Environmental exposure to harmful algae bloom | | Z77.121- Contact with and (suspected) exposure to harmful ... |
| 3284... | Environmental exposure to Pfiesteria piscicida | | Z77.121- Contact with and (suspected) exposure to harmful ... |
| 3284... | Environmental exposure to Pfisteria piscicida | | Z77.121- Contact with and (suspected) exposure to harmful ... |
| 3281... | Environmental exposure to red tide | | Z77.121- Contact with and (suspected) exposure to harmful ... |
| 4622... | Environmental hyperthermia of newborn | Preferred | P81.0- Environmental hyperthermia of newborn |
| 2883... | Environmental illness | | R69- Illness, unspecified |
| 1696... | Environmental lung disease | | J98.4- Other disorders of lung |

Community Health Worker Training

- Presentation and discussion with ~15-20 La Clinica community health workers
- Collaborating with La Clinica prenatal health educators for patient education
- Adapted a presentation made by A Tovar Aguilar, et al., Florida State University (2018) with Migrant Clinicians Network presentation for CHWs workin with outdoor laborers



La Clinica's Climate Change Working Group

- In August-September of 2020, wildfire smoke caused extreme air pollution across the Bay Area region
- The wildfires were exacerbated by conditions caused by climate change
- Stanford University researchers estimate that over 1,200 people died from the smoke

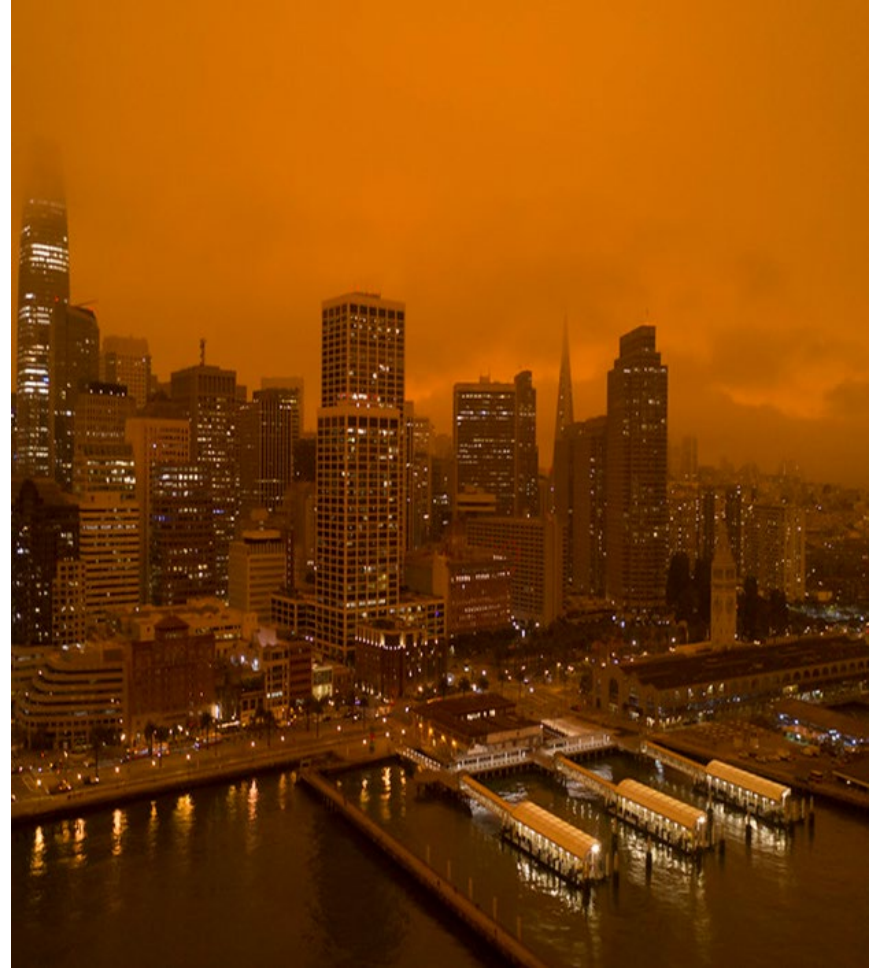


Photo Credit: Christopher Michel

La Clinica's Climate Change Working Group

- The Working Group's focus areas are:
- Helping our **patients prepare and adapt** to climate change, **particularly extreme heat and poor AQI**
- Encouraging connection to **nature** and environmental **stewardship** among patients and staff
- Participating in **advocacy** for climate change policy
- Reducing our own **emissions**



La Clinica's Climate Change Working Group

- Three staff members drafted an initial charter (contact me for a template)
- Host a **monthly lunch-hour meeting** and invited all interested staff via all-staff email
- Created a listserv and Teams page for the group that includes the charter, notes from each meeting, presentation slides, etc.
- Received a \$15,000 anonymous donation that has helped fund small projects over the years



La Clinica's Climate Change Working Group

- Attendance is ~5-15 per month at meetings, much is done by email
- Action items are identified in the meeting and followed up by relevant staff after the meeting
- Biggest challenge has been implementing changes at clinics
- **Mix of providers and managers/ administrative staff** from all levels of the organization and multiple sites and counties
- Chair of the meeting (me) provides notetaking, scheduling, administrative support for the group
- Fortunately, we have had executive sponsorship and support from day one!



La Clinica's Climate Change Working Group

- La Clinica participates in the Climate and Health Working Group hosted by CPCA as well as **NACHC's Environment and Health Office Hours**
- La Clinica also participates in the **Americares Climate Resilient Health Clinics** program, and the National Academy of Medicine's Climate Communities Network
- ***Connection Builds Power!***

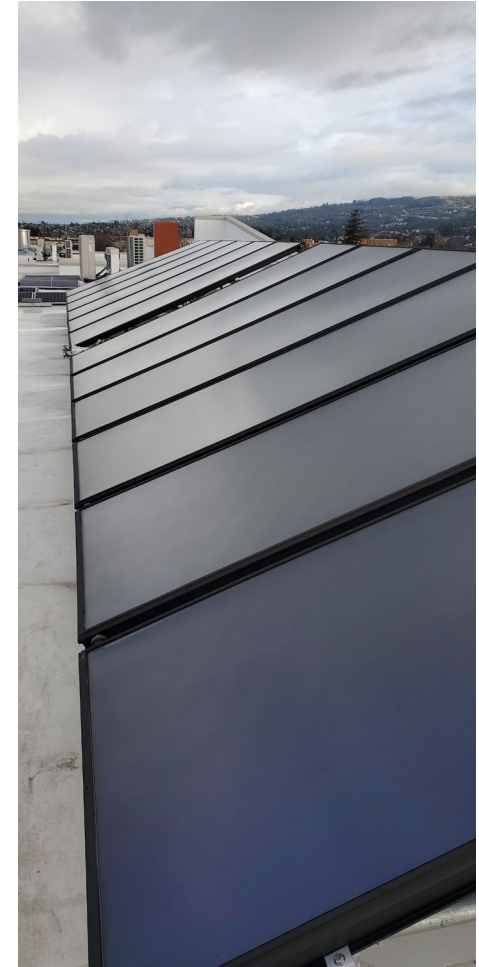


Emergency Preparedness

- La Clinica's Emergency Preparedness Specialist is very engaged with climate change preparations
 - Currently he is prospecting for grant funds to procure a "wish list" of equipment, including items like solar backup generators
- Vaccine management
 - Using new, better insulated refrigerators/freezers that are not affected by an electric outage for 72 hours
 - Using backup generators, and diverting/transferring vaccines to other sites/counties if needed.
 - Invested in a new updated HVAC system that is aimed at working more consistently at higher temperatures.

Current Activities and Next Steps

- Currently adding solar and battery backup in anticipation of brownouts during heat waves
 - Working with **Collective Energy** and **GRID Alternatives**
- Prospecting for grants to improve emergency preparedness for clinic resilience
- Reviewing guides and toolkits for weatherization and heat wave preparedness



Make Your Own Working Group!

- Form a Climate Change Working Group at your clinic or agency
- Set aside a regular time to meet and the rest will flow from there
- Contact Lily Kelly for templates - lkelly@laclinica.org
- Explore connecting patients and staff to nature and Indigenous ecological knowledge through outdoor activities



Additional Resources

- Posters available from:

<https://www.climatepsychiatry.org/heat-wave-toolkits-posters-and-handouts>
<https://climatehealthconnect.org/resources/posters/>

- City of Richmond Climate Action Plan:

<https://www.ci.richmond.ca.us/3313/Climate-Action-Plan>

- UCSF students created patient education pamphlets:

<https://climatehealth.ucsf.edu/wildfires-health-education-hub>

- AmeriCares Climate Toolkit

Mostly recommend the resources for administrators

<https://www.americares.org/what-we-do/community-health/climate-resilient-health-clinics/#toolkit>

- My Green Doctor to "green" clinics

<https://mygreendoctor.org>

- Case studies available from:

<https://www.medicineforachangingplanet.org/case-studies>

Thank you

E-V-E-R-Y-T-H-I-N-G—is connected.

*The soil needs rain, organic matter, air, worms and life in order to do what it needs
to do to give and receive life.*

Each element is an essential component.

*Organizing takes humility and selflessness and patience and rhythm while our
ultimate goal of liberation will take many expert components.*

*Some of us build and fight for land, healthy bodies, healthy relationships, clean air,
water, homes, safety, dignity, and humanizing education.*

*Others of us fight for food and political prisoners and abolition and environmental
justice. Our work is intersectional and multifaceted.*

Nature teaches us that our work has to be nuanced and steadfast.

*And more than anything, that we need each other—at our highest natural glory—
in order to get free.*

— adrienne maree brown
Emergent Strategy: Shaping Change, Changing Worlds