Heat Health

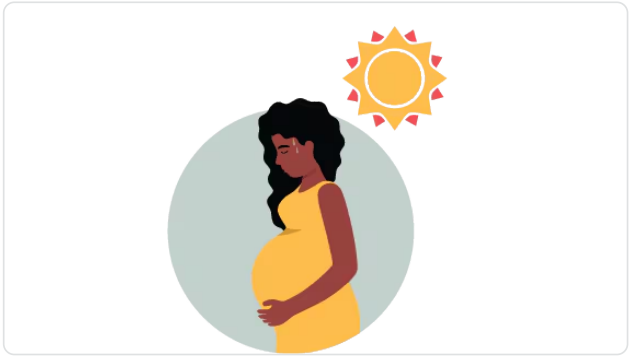
JUNE 18, 2024

CDC's website is being modified to comply with President Trump's Executive Orders.

Clinical Overview of Heat and Pregnancy

KEY POINTS

- Remind pregnant women to check the HeatRisk forecast daily during warm months and take protective action when HeatRisk is orange or higher, since heat can harm a pregnant woman's health during any trimester.
- There are several ways to stay healthy when it's hot outside. Create a Heat Action Plan with your pregnant patients.
- Exposure to heat can lead to health harms for pregnant women, including hypertensive disorders of pregnancy and pregnancy complications. As little as one day of high heat may increase risk.
- Encourage your pregnant patients to also check the air quality index (AQI) daily and take protective action when the AQI is >100, since hot days can worsen air quality. Breathing polluted air can harm pregnant women.
- Review commonly prescribed medications with your pregnant patients, such as antihistamines or antihypertensive medications for pregnant women, since they may increase heat sensitivity. Periodic review of medications, and patient education on risk reduction before and during the heat season, may prevent harm.



Background

This guidance document is intended to help support your conversations with pregnant women on the impact of heat on pregnancy. The information provided can empower them to take protective actions on hot days. While not everyone may be able to take all actions, each action can help a pregnant women stay healthy during hot days.

Risk factors

Pregnancy and heat exposure

Being outside can provide many health benefits. Exposure to heat, however, can lead to health harms for pregnant women including hypertensive disorders of pregnancy, and to pregnancy complications. Heat can place added stress on the heart and cardiovascular system, which is already undergoing normal physiologic changes during pregnancy, including increased blood volume, cardiovascular output, and heart rate.

Heat exposure in any trimester has been associated with adverse pregnancy outcomes including preterm births, stillbirths, and low birthweight infants. In addition, heat exposure during the first trimester of pregnancy may increase the risk of certain birth defects.

Risk for adverse pregnancy outcomes increases with increasing temperatures and longer heat exposure, although as little as one day of high heat, defined as above the 95^{th} percentile of mean temperature, may increase risk.

Heat, air quality, and pregnancy

Hot days can promote unhealthy levels of air pollutants, including ozone, fine particulate matter, and sulfur dioxide. Breathing polluted air causes inflammation and epigenetic changes that can interfere with placental blood flow and development, as well as promote blood clot formation. Exposure to both heat and air pollution together can increase the risk of adverse pregnancy outcomes, including preterm births, compared to either weather event alone.

Hot and dry weather can also increase the risk of wildfires. Wildfire smoke pollutants are known to be associated with adverse birth outcomes.

Breathing polluted air can be particularly unsafe for pregnant women with asthma. Asthma can contribute to pregnancy complications and adverse pregnancy outcomes such as preterm birth, low birth weight infants, and perinatal mortality, with a higher likelihood for these events for pregnant women with asthma who are exposed to poor air quality. Pregnant women with asthma may benefit from including steps to reduce heat and poor air quality exposure in both their Heat Action Plan and their Asthma Action Plans.

Pregnant women working in hot environments may be able to request reasonable accommodations in the workplace to reduce heat stress, such as increased breaks to cool down, hydrate, and use a bathroom.

Heat, medications, and pregnancy

Many medications, including over the counter medications, can impair heat tolerance and the body's ability to regulate its temperature. Medications can decrease the body's ability to sweat, and therefore to cool itself. That can predispose people to heat illness during hot days.

Commonly prescribed medications in pregnancy, including those use to treat high blood pressure, can amplify effects of heat exposure including electrolyte and fluid imbalance and dehydration. Dehydration and electrolyte imbalance can increase adverse events like syncope, arrhythmias, and blood clots. Dehydration can also contribute to kidney injury from nephrotoxic drugs and can also increase blood levels of medications which may result in adverse events. Lastly, many medications, including certain antibiotics, can increase sensitivity of the skin to the sun.

Attention to heat exposure as a component of careful medication selection during pregnancy may prevent harm to pregnant women. The Heat and Medications page provides more information on medications and heat that can inform patient guidance.

Patient management

Take these 5 steps to help your pregnant patients stay safe on hot days and document in them a Heat Action Plan with your patients.

1. **Assess risk factors that may make heat or poor air quality more likely to lead to pregnancy complications**.
    - **Ask about baseline status of underlying health conditions** that may increase the risk of heat harms during pregnancy, including asthma or hypertension.
    - **Use the CHILL'D-OUT questionnaire** to do a risk factor assessment**.** If your time is limited, ask the questions in bold.
        - **C – Cooling**
            - **Does your patient have working air conditioning?**
            - Can they check and control indoor temperatures where they live?
            - Do they have an electric fan?
            - Do they know how to locate a cooling center if needed?
        - **H – Housing**
            - **Does your patient have stable housing?**
            - Do they live on a higher floor of a multi-story building where they may be exposed to more heat?
            - Are they regularly exposed to indoor air pollutants such as secondhand smoke or mold?
            - Do they have a portable air purifier or a filter in their HVAC system?
        - **I – Isolation and mobility**
            - **Does your patient have a neighbor, friend, or family member who can check on them during hot days?**
            - Does their mobility limit their ability to seek cooling in their home or elsewhere?
        - **L – eLectricity**
            - **If heat leads to a power outage,** does your patient have a plan for refrigerated medications and/or electric medical devices, such as nebulizer machines, ventilators, or oxygen concentrators?
        - **L – Learning**
            - **Does your patient check the daily and hourly weather forecast to know the hottest time of the day? Can they access the HeatRisk tool?**
            - Where does your patient get information about how to protect their health from heat and what measures do they take to do so?
        - **D – Drugs**
            - **Does your patient take medications that increase risk from heat exposure?**

- **Out – Outside**
  - **How much time does your patient spend outdoors on hot days for work, sports, or recreation?**
  - Are they exposed to outdoor air pollution at home, work, or elsewhere, such as a major roadway, construction site, industrial facility, or frequent wildfire smoke?
  - Do they have allergies to grass, weeds, and tree pollens?

2. **Educate your patients on how to stay cool during hot days.**

- Review the HeatRisk Tool with your patients. The tool outlines how commonly each color HeatRisk level may occur and provides suggested actions people can take at each color level.
- Most patients can take action beginning when the HeatRisk is **orange**.
  - Some people will be sensitive to heat when HeatRisk is **yellow** and will need to take action at the yellow level. Ask your patients to monitor their symptoms at HeatRisk yellow and orange and let you know if this applies to them.
- Review the signs of heat-related illness and pregnancy warning signs with your patients. Heat symptoms include heavy sweating, muscle cramps, weakness, light headedness, headache, nausea, vomiting, and preterm contractions. Develop a plan with them for when to seek medical care.
- Advise your patients on how to stay cool outdoors at each level of the HeatRisk tool. In addition, when outside, everyone can:
  - Wear light, loose-fitting clothing that covers arms and legs, a hat with a brim that shades the face, ears, and back of the neck, and sunglasses.
  - Apply broad spectrum sunscreen that filters out UVA and UVB rays. The sunscreen should have an SPF of 30 or higher.
- Remind your patients to try to schedule their activities during the coolest time of the day or evening, if possible.
- Talk to your patients about how to stay cool indoors. They can:
  - Use an air conditioner if they have one or find a location that does. Even a few hours in a cool location can lower the risk for health problems from heat.
  - Use fans, but only if indoor temperatures are less than 90°F. In temperatures above 90°F, a fan can increase body temperature.
- Refer patients who need assistance with home energy costs to the Low-Income Heat Energy Assistance Program (LIHEAP).
- Direct your patients to information about public resources such as cooling centers, pools, and splash pads. The nearest cooling center locations can be located by calling 2-1-1, checking public resources, and/or contacting your local health department and emergency management agency.

3. **Educate your patient on how to stay hydrated.**

- Review signs and symptoms of dehydration, which include

Cold, clammy skin	Nausea
Dizziness or feeling lightheaded	Abdominal cramping
Rapid heart rate	Swelling in extremities
Excessive sweating or an inability to sweat	Darker color urine
Fatigue	Infrequent urination
Headache	Thirst
Muscle cramps or spasms	Preterm contractions

- Emphasize the importance of regular and consistent fluid and food intake throughout the day.
- Advise patients to consider limiting beverages higher in sugars, sodium, and caffeine, if possible, which may lead to dehydration. See Guideline 4 of the dietary guidelines PDF.
- Advise patients that water is usually the best choice, although sports drinks containing electrolytes may be necessary if sweating for several hours.
- Patients with nausea, vomiting, and diarrhea will need particular attention to avoiding dehydration and fluid and electrolyte imbalance, which heat exposure can compound.

4. **Educate your patient on air quality, since heat worsens air quality which impacts their health**.

- Review the Air Quality Index (AQI) with your patients at on the HeatRisk Dashboard, their phone's weather app, or at airnow.gov. Ensure they know how to access, understand, and use the information including which action steps they can take based on the specific air quality level.
- Review indoor air quality measures.
  - **Steps to Take for Good Indoor Air Quality**
    - Remind your patients that indoor air can be as polluted as outdoor air.
    - Educate patients that cigarette and e-cigarette smoke, candles and air fresheners are indoor sources of air pollution.
    - If possible, bring outdoor air in when cooking indoors.
    - Encourage patients to allow clean indoor air inside when the AQI is less than 100 (or <50 for sensitive individuals).
- **About Air Filters**
  - **Discuss air purifiers, also known as air sanitizers, air cleaners, and/or air filters used in HVAC systems**. While these devices cannot remove all air pollutants, they can improve indoor air quality for many pollutants when used properly. A list of portable cleaners can be found here.
  - Some homes have HVAC systems with replaceable filters. These filters have MERV (Minimum Efficiency Reporting Values) ratings or are designated as HEPA (high efficiency particulate air) filters. To effectively remove indoor air pollution, HEPA filters or filters with MERV of 13 or higher can be used.
  - Air filters should be replaced regularly. Replacement frequency depends on how much air pollution is present but can be done every 60-90 days.
  - Do-it-yourself (DIY) air cleaners may be a more affordable and accessible alternative to commercial versions to filter out smoke particles and can be constructed using a box fan and a high-efficiency home air filter.

Did you know?

About the Air Quality Index (AQI) and Actions to Consider at Each Level

The AQI reports air quality for common air pollutants such as ground-level ozone, particle pollution, carbon monoxide, sulfur dioxide, and nitrogen dioxide. Its value ranges from 1 to 500, with higher numbers corresponding to worse air quality and greater health concerns.

When the number is above 100, outdoor air is considered unhealthy for sensitive groups including pregnant women. **On days with an AQI > 100,** it is okay to be outside, **but they can consider taking more breaks and do less intense activities. If they have asthma**, they can follow their asthma action plan and keep quick relief medicine handy.

Some pregnant women may be sensitive to air pollution when the AQI is between 51 and 100. Ask your patient to use the AQI to assess whether they have more symptoms when the AQI is between 51 and 100. If so, refer them to actions to take for people sensitive to poor air quality.

Of note, **the Air Quality Index does not include pollen counts**. This means that on some days, the Air Quality Index may be low even though pollen levels in the air are high.

5. **Make a plan for medication management on HeatRisk orange, red, and magenta days.**

- Counsel your pregnant patients to take all medications as directed unless otherwise guided by you or another clinician.
- For a pregnant women with asthma, review the Asthma Action Plan and consider any necessary changes to asthma medications on hot days.
- Review your patient's medication list with them, highlighting medications that may reduce their heat tolerance, such as some antihistamines, or medications that may need to be adjusted because of interactions with higher heat. See the Heat and Medications page for more information.
- Provide guidance on proper medication storage, especially for medications that individuals may carry with them, such as inhalers, which can malfunction or burst from high heat. Counsel your patients not to leave medications in a car or other places that can get excessively hot. Remind patients that insulin can be degraded by heat and should be refrigerated.
- Counsel your patients to limit sun exposure if they take a medication that can cause sensitivity to the sun, such as certain antibiotics. To avoid sunburn which can promote dehydration, recommend applying sunscreen of SPF 30 or greater, using a sun-protective hat and clothing, and trying to stay indoors during the hottest part of the day.
- Plan for what to do in the event of a power outage for medications requiring refrigeration like insulin, for medication delivery devices like nebulizer machines, and for electrical medical devices, like ventilators and oxygen concentrators.

SOURCES

CONTENT SOURCE:

National Center for Environmental Health (NCEH)