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Expanding Awareness of Air Quality and Health Impacts in the Clinical Setting

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Expanding Awareness of Air Quality and Health Impacts in the Clinical Setting

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Hinesburg Family Medicine
July - August 2023
Mentored by Dr. Michelle Cangiano
Problem Identification

- **Wildfire activity has been increasing over the past several decades** and is likely to continue to do so as climate change progresses, leading to a continued decrease in air quality. Negative health impacts of wildfire smoke and is likely to grow in the future. (Liu, 2015 and Reid, 2019)

- Poor air quality has a higher risk of affecting people with **heart or lung disease**, **older adults**, and **children**. (Asthma - CDC, 2023)

- Throughout this summer, Hinesburg Clinic staff members have had a huge increase in patients calling in with **asthma exacerbation** or for **inhaler refills**.

### AHEC Focus Areas: Current and Emerging Health Issues and Medical Practice Transformation

- Vermont has had multiple days this summer with moderate to unhealthy air quality due to wildfire smoke, which is impacting Vermonters’ health.
- Guidance for providers on wildfire smoke and air quality is limited making it difficult for them to pass information along to patients.

#### Average Daily Air Quality from 6/1-8/1/2023 For Chittenden County, VT*

<table>
<thead>
<tr>
<th>Air Quality</th>
<th>Number of Days</th>
</tr>
</thead>
<tbody>
<tr>
<td>Good</td>
<td>43</td>
</tr>
<tr>
<td>Moderate</td>
<td>15</td>
</tr>
<tr>
<td>Unhealthy for Sensitive Groups</td>
<td>2</td>
</tr>
<tr>
<td>Unhealthy</td>
<td>2</td>
</tr>
<tr>
<td>Very Unhealthy</td>
<td>0</td>
</tr>
<tr>
<td>Hazardous</td>
<td>0</td>
</tr>
</tbody>
</table>

Public Health Cost

Poor air quality leads to exacerbations of existing lung and cardiovascular disease, causing an increase in healthcare utilization.

According to Vermont Asthma Surveillance Data Published in 2022 (Asthma Data Pages - VDH, 2022):

- 1 in 8 adults and 1 in 12 children have asthma
- Vermonters with a lower socioeconomic status, those unable to work, and those insured by Medicaid are more likely to have asthma than Vermonters in General.
- In 2015, hospitalizations and ED visits for asthma cost $6.4 million dollars.

- U.S. health care spending on respiratory diseases totaled $170.8 billion in 2016, representing 6.3% of total U.S. health care spending that year. Spending was highest for asthma, COPD, and the aggregate category of other chronic respiratory diseases. (Duan, 2023)

- While the impact of the current air quality on health care cost is being monitored, exacerbations of asthma, other lung diseases, and cardiovascular disease is likely to have a large financial impact in 2023, particularly because of historical spending trends both in Vermont and nationally.
“Air quality is a health equity issue, not everyone can go inside and breathe clean air from their air purifiers. People who work outside such as farmers, individuals without homes, and individuals without the financial means to invest money into air conditioners or purifiers will be impacted the most.”

David Grass, PhD.
Senior Environmental Health Program Manager for the Vermont Department of Health

“"I am very concerned we will continue to have more low air quality days in the future. The amount of fuel for Canadian wildfires is growing. This year we have had multiple days with air quality in the unhealthy range. We need to be prepared that these days will be around in the future."

David Grass, PhD.
Senior Environmental Health Program Manager for the Vermont Department of Health

“We have seen a substantial increase in patients calling in to refill their inhalers and more moms calling in with concerns about what to do with their children who have asthma that has gotten worse. Patients are also presenting with more inflammatory symptoms other than just shortness of breath, including swollen/sore throats, headaches, sinus pressure, and others. Finding resources on what guidance to provide is difficult right now.”

Michelle Cangiano, MD
Hinesburg Family Medicine
Intervention: Patient Education Posters

At the clinic, there was no information about air quality and health impacts visible to patients.

Research was completed to find educational poster that can inform patients of the health impacts of air quality in a clear, colorful, and concise way.

Posters were selected to spark discussion with providers and to display links to additional resources that patient can follow-up with.

Expanding Awareness of Air Quality and Health Impacts in the Clinical Setting

The following public health recommendations are to protect children and youth (0-19 years) from fine particle air pollution (PM2.5) for example, wildfire smoke. Apply this guide to school, child care, athletic programs and camps, before and after school programs, camps, field trips, and other outdoor programming and activities. Air quality forecasts for the following day can be found at AirNow.gov or by 4:00 pm. As conditions can change quickly, be sure to check back for updates.

### Vermont Children and Youth Activities Guide for Air Quality

**Outside Air Quality Index (AQI): PM2.5**

<table>
<thead>
<tr>
<th>Activity Duration</th>
<th>Good (0-59)</th>
<th>Moderate (60-150)</th>
<th>Unhealthy for Sensitive Groups (151-300)</th>
<th>Unhealthy (301-500)</th>
<th>Very Unhealthy or Hazardous (501-999)</th>
</tr>
</thead>
<tbody>
<tr>
<td>15 mins to 1 hour</td>
<td>No restrictions. Allow children and youth with heart or lung disease to stay indoors or when outside, if needed. Limit intensity of activities.</td>
<td>No restrictions. Allow children and youth with heart or lung disease to stay indoors or when outside, if needed. Limit intensity of activities.</td>
<td>Limit to moderate intensity activities indoors. For children with heart or lung disease, further restrictions may be necessary to protect health. Limit to light intensity activities outdoors or in a different location.</td>
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</tr>
<tr>
<td>1-4 hours (for example, school or work)</td>
<td>No restrictions. Allow children and youth with heart or lung disease to stay indoors or when outside, if needed. Limit intensity of activities.</td>
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</tr>
<tr>
<td>4 hours (for example, school or work programming, day camp, overnight camp)</td>
<td>No restrictions. Allow children and youth with heart or lung disease to stay outdoors or when outside, if needed. Limit intensity of activities.</td>
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</tbody>
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**Activity Examples:**
- **Light Intensity Activities:** walking, biking, golf, hunting, cycling, playing catch.
- **Moderate Intensity Activities:** softball, volleyball, climbing on playground.
- **Vigorous Intensity Activities:** swimming, soccer.

**Additional Considerations:**

- Close windows and doors when activities are moved indoors. Pay attention to local outdoor air quality alerts.
- Consider purifying air with a HEPA filter and air conditioning to recirculate indoor air.

- All children and youth body and age are considered a sensitive group. Health conditions include but are not limited to allergies, asthma, any chronic lung disease, heart disease, diabetes, and respiratory infections (for example, PIV and pneumonias).
Results

Posters were distributed to patient rooms throughout the clinic

- Started discussions on air quality health impacts, particularly on vulnerable populations
- Encouraged rooming staff to have patients look over the education boards while they are waiting for their provider

After a longer time of the posters being seen in the clinic, we hope:

- Patients will be more likely to ask about precautions they could take on poor air quality days
- Increased communication regarding the need for refills during scheduled appointments
- Improved symptom awareness and outreach to providers
Effectiveness and Limitations

Proposed Evaluation of Effectiveness:

• Monitor patient engagement with the material through **assessing** the number of **patient visits** were asthma or lung disease was discussed.

• Survey **patients’ attitudes** towards discussing air quality with clinic staff.

• **Record the number of medication refills** for asthma or lung disease during scheduled appointments.

Limitations:

• **Engagement**: Patients must engage with the materials in the posters for the intervention to be successful.

• **Time**: Patient visits are often directed on a specific concern and limited on time so patients may not have time for questions.

• **Information Gaps**: There is still limited data on the health impacts of long-term wildfire smoke inhalation, and this is a new problem in Vermont. It will take more time for additional information and guidelines to become available.
Recommendations

Continue communication between the Vermont Department of Health and primary care clinics to help with information dissemination as new guidance is determined.

Consider linking a handout or creating a resource for patients that can be a part of their after-visit summary to help provide information for patients outside of the clinical setting.

Provide education to primary care providers on the health impacts of air quality that they will be able to relay to patients when asked.

Consider prompting providers to ask all patients with asthma or other lung diseases if they have had any changes or increases in symptoms, regardless of the topic of the appointment.


• Title Slide Photo: Jenn Jarecki / Vermont Public https://www.vermontpublic.org/local-news/2023-07-03/a-vermonters-guide-to-wildfire-smoke-and-air-quality

• Poster Sources: