Air Quality, Health & Advocacy
Hello

I am Rachel McIntosh-Kastrinsky, MSPH
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A little bit about MAHA...

Clean Air Carolina Mission

Ensure cleaner air quality for all North Carolinians through education and advocacy and by working with our partners to reduce source pollution.

MAHA is a program within Clean Air Carolina that consists of a statewide network of medical and health professionals leading the call for cleaner air through education and advocacy.

www.cleanaircarolina.org/MAHA
Tell me about yourself...
What to take away from today

- Identify common air pollutants
- List impacts of air quality on health
- Advise patients on limiting exposure to pollution
- Making a greater impact in your community
Children are uniquely vulnerable to environmental contaminants, from increasing air pollution to the effects of climate change. AAP is undertaking federal advocacy efforts to ensure children are safe where they live, learn and play.

- American Academy of Pediatrics
Air pollution is the world’s biggest killer

Absolute number of deaths by country attributed to ambient (outdoor) air pollution of particulate matter (PM) and ozone (O₃) in 2016.

Ambient air pollution is estimated to be the cause of 4.3 million premature deaths every year.

*Institution of Health Metrics and Evaluation (IHME)
Where are air pollution levels high?

Industrial areas & areas that produce smoke

Near busy roads

Urban areas
And also when weather is calm and in all seasons
What are some key air pollutants?

- Ground Level Ozone ($O_3$)
- Particulate Matter ($PM_{10}$, $PM_{2.5}$)
- Greenhouse Gases - Carbon ($CO_2$)
Ground-Level Ozone

Nitrogen oxides are emitted by automobiles, power plants, and other combustion processes.

Hydrocarbons are emitted from automobiles, gasoline stations, paint, degreasers, cleaning fluids, and many other sources.
Airborne particles such as smoke, dust, dirt, soot, and salt. The sources of these particles include vehicles, factories, fires, and other natural or human activity resulting in the addition of particles into the air.
The Greenhouse Effect

Composition includes Carbon Dioxide, Methane, & Nitrous Oxide

1. The sun’s radiation travels toward the earth.
2. About half is reflected or absorbed by clouds and the atmosphere.
3. The rest reaches the earth, where it is absorbed by oceans and land.
4. The earth also releases heat back toward space.
5. Some of this heat passes directly through the atmosphere.
6. But most of it is captured and retained by greenhouse gases.
Air pollution affects people throughout their lifetime

**Pregnancy**
- low birth weight

**Children**
- asthma
- slower development of lung function
- development problems
- more wheezing and coughs
- start of atherosclerosis

**Adults**
- asthma
- coronary heart disease
- stroke
- lung cancer
- chronic obstructive pulmonary disease (as chronic bronchitis)
- diabetes

**Elderly**
- asthma
- accelerated decline
- lung function
- lung cancer
- diabetes
- dementia
- heart attack, heart failure and strokes

Infographic Source: Public Health England
Let’s measure lung capacity!

- Stretch the balloon several times

- Take as deep a breath as possible. Then **exhale all the air you can into the balloon** and pinch the balloon closed to prevent air from escaping

- Measure and record the diameter of the balloon
Risk groups to poor air quality

**Children**
- Lungs & brain are still developing
- Breathe at faster rates than adults
- Spend more time outdoors
- More vulnerable to heat impacts & dehydration
- More likely to have asthma

**African Americans & Minorities**
- Often have less access to healthcare, well-insulated housing, air conditioning, or transportation
- Experience higher rates of diseases & poor birth outcomes
Asthma Facts

107,135
Chronic Health Conditions Related to Asthma Reported to School Nurses in NC, 2017-18

19,762
Emergency Room Visits for Asthma for Ages 0-14 in NC, 2014-15

17.9%
Prevalence of Asthma Among NC Resident Children
Breathing challenge

- Put the straw in your mouth and breathe normally for a few seconds
- Start to pinch the straw slightly, pinching more as you continue breathing
- Describe the difference in your ability to breathe with and without pinching the straw
Air pollution is a leading cause of death

<table>
<thead>
<tr>
<th>Rank</th>
<th>Cause</th>
<th>Deaths, 2016</th>
<th>Deaths, 2017</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Cancer</td>
<td>19,523</td>
<td>19,474</td>
</tr>
<tr>
<td>2</td>
<td>Heart Disease*</td>
<td>18,266</td>
<td>18,808</td>
</tr>
<tr>
<td>3</td>
<td>Accidents</td>
<td>5,476</td>
<td>5,985</td>
</tr>
<tr>
<td>4</td>
<td>Chronic Lower Respiratory Disease*</td>
<td>5,311</td>
<td>5,540</td>
</tr>
<tr>
<td>5</td>
<td>Stroke*</td>
<td>4,940</td>
<td>5,098</td>
</tr>
</tbody>
</table>

Source: Centers for Disease Control & Prevention
Increased wildfires

Increased drought

Increased flooding
Climate Change Impacts in NC

- Poorer air quality
- Increased heat
- Shorter winters
Climate Change Impacts in NC

- Poorer air quality
- Increased heat
- Shorter winters

- More potent allergens
- Increased respiratory problems
- Heat related illnesses
- More infectious disease vectors
Poorer air quality
Increased heat
Shorter winters
Climate Change Impacts in NC
More potent allergens
More potent allergens
Increased respiratory problems
Heat related illnesses
Increased heat
Shorter winters
More infectious disease vectors
More infectious disease vectors
Guidance on advising patients

**Discuss...**
with patients whether they live, work, or study near sources of pollution

**Follow...**
the Air Quality Index to know when it is safe for high level outdoor activity

**Avoid...**
wood-burning on wood stoves & air furnaces around vulnerable patients

**Close...**
air vents in cars when sitting in traffic

**Suggest...**
HEPA air purifiers to vulnerable patients

**Reduce...**
carbon footprint with healthier transportation and diet
<table>
<thead>
<tr>
<th>Air Quality Index</th>
<th>Who Needs to Be Concerned?</th>
<th>What Should I Do?</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Good 0-50</strong></td>
<td>It is a great day to be active outside</td>
<td><a href="https://www.airnow.gov/index.cfm?action=aqibasics.aqi">https://www.airnow.gov/index.cfm?action=aqibasics.aqi</a></td>
</tr>
<tr>
<td><strong>Moderate 51-100</strong></td>
<td>Some people who may be unusually sensitive to particle pollution</td>
<td><strong>Unusually sensitive people</strong>: Considering reducing longer or heavy exertion. Watch for symptoms such as coughing or shortness of breath. These are signs to take it easier.</td>
</tr>
<tr>
<td><strong>Unhealthy for Sensitive Groups 101-150</strong></td>
<td><strong>Sensitive Groups</strong> include people with heart or lung disease, older adults, children and teenagers</td>
<td><strong>Sensitive groups</strong>: Reduce prolonged or heavy exertion. It is OK to be active outside, but take more breaks and do less intense activities. <strong>People with asthma</strong> should follow their asthma action plans and keep their quick relief medicine handy. <strong>If you have Heart Disease</strong>: Symptoms such as palpitations, shortness of breath, or unusual fatigue may indicate a serious problem. If you have any of these issues, contact your health care provider.</td>
</tr>
<tr>
<td><strong>Unhealthy 151-200</strong></td>
<td>Everyone</td>
<td><strong>Sensitive groups</strong>: Avoid prolonged or heavy exertion. Move activities indoors or reschedule to a time when the air quality is better. <strong>Everyone else</strong>: Reduce prolonged or heavy exertion. Take more breaks during all outdoor activities.</td>
</tr>
<tr>
<td><strong>Very Unhealthy 201-300</strong></td>
<td>Everyone</td>
<td><strong>Sensitive groups</strong>: Avoid all physical activity outdoors. Move activities indoors or reschedule to a time when the air quality is better. <strong>Everyone else</strong>: Avoid prolonged or heavy exertion. Move activities indoors or reschedule to a time when the air quality is better.</td>
</tr>
<tr>
<td><strong>Hazardous 301-500</strong></td>
<td>Everyone</td>
<td><strong>Everyone</strong>: Avoid all physical activity outdoors. <strong>Sensitive groups</strong>: Remain indoors and keep activity levels low. Follow tips for keeping particle levels low indoors.</td>
</tr>
</tbody>
</table>
What to do with kids on poor air quality days?

Limit time outdoors
- Limit the time of your outdoor workout
- Avoid exercising near high traffic areas
- Limit spending time outdoors between 2–7 PM

Suggest indoor activities
- Exercise in your local gym or community center
- Visit your local library
- Try a STEM indoor learning activity
- Go to a museum
- Play board games
- Play indoor bowling
- Start an indoor garden
Other ways to make an impact

- Educational materials
- Policies
- Advocacy actions
Why is it important for you to advocate?

Gallup Poll: Americans’ Ratings of Honesty and Ethical Standards in Professions (2017)

<table>
<thead>
<tr>
<th>Rank</th>
<th>Professions</th>
<th>% High</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Nurses*</td>
<td>82</td>
</tr>
<tr>
<td>2</td>
<td>Military officers</td>
<td>71</td>
</tr>
<tr>
<td>3</td>
<td>Grade school teachers</td>
<td>66</td>
</tr>
<tr>
<td>4</td>
<td>Medical doctors*</td>
<td>65</td>
</tr>
<tr>
<td>5</td>
<td>Pharmacists*</td>
<td>62</td>
</tr>
</tbody>
</table>
Making a wider impact through MAHA

MAHA helps members...

- Talk to colleagues and family
- Visit elected officials and testify at public hearings
- Speak at events
- Serve on boards and commissions

MAHA provides members with...

- Research updates and summaries
- Action alerts, sign-on letters, and talking points
- Factsheets and tools about air quality and climate change
- Advocacy manual and training sessions

U.S. CALL TO ACTION ON CLIMATE, HEALTH, AND EQUITY: A POLICY ACTION AGENDA
MAHA has over 700 members across North Carolina, with board members representing Charlotte, Raleigh, Asheville, Jamesville, Greenville, Kernersville, and Wilmington.
MAHA partners with various health and policy organizations across the state to achieve its mission of education, advocacy, and training.
MAHA Involvement

Become involved with MAHA initiatives and programs, including:

- Clean Construction Partnership
- AirKeeper Program
- NC BREATHE event
- Other educational and advocacy opportunities
Join MAHA today

www.cleanaircarolina.org/MAHA

& help us improve with feedback by filling out this quick survey.

https://docs.google.com/forms/d/e/1FAIpQLSfjOAaNBR2ePwrTuJSjUltCydK-bJBxWI3nWATYJzHqyar8vg/viewform

THANK YOU!