Epidemic of Asthma in Pittsburgh

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Childhood Asthma: A Disease of Epidemic Proportions

- Most serious, chronic disabling disease of childhood
- Growing at alarming rate
- Affects ~1 out of 13
- Annual cost of $20 billion

www.americanasthmafoundation.org
Living with Asthma is Frightening

- Severity varies
- Attacks may begin without warning
- Airways constrict and swell
- Muscles in the lungs automatically tighten
- Wheezing, coughing or panting begins
- Mucus is produced
- Suddenly the asthmatic is gasping for breath

www.americanasthmafoundation.org
American Allergy and Asthma Foundation 2012
Most Challenging Places to Live with Asthma:

Pittsburgh Ranks 4th

- **Components:**
  - Prevalence
  - Risk factors
  - Medical factors

- **Assessments:**
  - Air pollution
  - Ozone days
  - Pollen counts
  - Medication use
  - Poverty rates
  - Smoking laws
Potential Factors Influencing Racial Disparities in Asthma

- Gene-environment interactions
- Socioeconomic status
- Psychological and social factors
- Stress at individual and community level
- Physician-patient miscommunication

Environmental Exposures Influencing Asthma Development/Progression

- Allergens
- Ozone & Particulates
- Tobacco Smoke

Hereditary tendency toward atopy
- Respiratory Viruses
- Psychological Stress
- Obesity & Nutrition

Asthma
Pittsburgh Continues to Rank Among Most Polluted Cities

American Lung Association State of the Air 2013

2013 Ranks

- 24th: ozone
- 8th: year round particle pollution
- 7th: short term particle pollution
Pittsburgh Did Improve But Still Received Failing Grades

American Lung Association State of the Air 2013

<table>
<thead>
<tr>
<th>Category</th>
<th>Change Since 1996</th>
<th>Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>High Ozone Days</td>
<td>30 less days</td>
<td>F</td>
</tr>
<tr>
<td>Particle Pollution Days</td>
<td>41.3 less days</td>
<td>F</td>
</tr>
<tr>
<td>Annual Particle Pollution Level</td>
<td>-6.4 ug/m³</td>
<td>F</td>
</tr>
</tbody>
</table>

Bottom Line: Continued improvement but more work still needs to be done!
Role of ETS in the Epidemic of Childhood Asthma

Data Comparison
- National Health Interview Survey of 4,500 children
- ALA data on cigarette consumption during last century

Parallel increase in adult smoking and childhood asthma

US Cigarette Consumption

ETS During Infancy/Early Childhood in Pittsburgh

Prevalence in Study 1
(37 Infants)

33%

Prevalence in Study 2
(67 Preschoolers)

32%

Patel A. JACI 2007;119:S45.
Impact of Environmental Tobacco Smoke (ETS) on Childhood Asthma

- 1/3 of children < 7 yrs exposed in home daily
- ETS is risk factor for onset and trigger of asthma
- Association between prenatal ETS and childhood asthma (OR = 1.87)
- Prenatal exposure specific for asthma
- 26% children reporting ETS as a trigger have at least one parent who smoke

Parallel Increase in Prevalence of Overweight/Obesity

Association Between Obesity and Asthma

- Elevated BMI is associated with a dose-dependent increase in asthma incidence and severity.
- Elevated BMI is associated with differential responses to asthma therapies.
- Obesity is associated with increased atopy in children.

Beuther DA, Sutherland ER. AJRCCM 2007;175:661.
Epidemic of Childhood Obesity and Asthma in Pittsburgh’s Inner-City

Cohort 1 (n=61):

Possible Asthma (%): 31%

BP Distribution (%):
- Normal: 38%
- Overweight: 26%
- Obese: 36%

Epidemic of Childhood Obesity and Asthma in Pittsburgh’s Inner-City

Cohort 2 (n=70):

Failed ACT (%)

BMI Distribution (%)

Marcotullio N. Presented AAAAI 2011.
Improved Asthma Outcomes in a Sports-Oriented Education Model

- 23 participants in day-long camp
  - Asthma control/education
  - Basketball skills
- Asthma outcomes assessed by survey at baseline and 2 and 6 months later

Koershen JM et al. JACI 2010;125:AB52.
Positive Outcomes in A Sports-Oriented Model of Asthma Education

**Missed School Days**

**Acute Visits**

**Prednisone Bursts**

**ER Visits**

**Major challenge is tailoring program to needs of population!**

Koershen JM et al. JACI 2010;125:AB52.
Summary of Asthma and Its Triggers

- Asthma is an epidemic
- Pittsburgh ranks 4th
- Causes are multifactorial
- ETS and outdoor air pollution continue to be issues
- Obesity is also at epidemic proportions
- Community involvement is vital