School-Based Directly Observed Asthma Therapy

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Preventive Care Program for Urban Children with Asthma

Learning Objectives

1. Describe gaps in care and the burden of asthma on school children
2. Present the benefits of school-based Directly Observed Therapy (DOT)
3. Outline steps for implementation of DOT in schools
4. Highlight next-steps for sustainability and dissemination of school-based programs

NOTE: Author has no conflicts of interest to disclose

Overview

- Background and Setting
- Gaps in Asthma Care and Inadequate Adherence
- Impact on Schools
- School-Based Asthma Care
- Directly Observed Therapy (DOT) Implementation
- Sustainability and Future Directions
**Background – Pediatric Asthma**

Asthma is common and disproportionately affects low income, urban, and minority children

- Nearly 10% of U.S. children
- Much higher prevalence in areas of concentrated poverty, such as City of Rochester neighborhoods
- Causes preventable morbidity from episodic recurring symptoms and wide ranging impairment
- Inhaled corticosteroids are the standard of care and recommended daily preventive treatment
- Disparities persist in medication use, health care utilization, and health outcomes for low income, urban, and minority children

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**Rochester, NY**

Residents of upstate NY cities struggle and Rochester is not faring well.

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**Poverty is Pervasive for Far Too Many**

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<td>12</td>
<td>Utica, NY</td>
<td>41.3</td>
<td>45.0</td>
<td>3.7</td>
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Could Asthma be a Symptom?

Of complex public health problems that contribute to significant health disparity, morbidity, and gaps in care provision and outcomes.

The Delivery of Preventive Asthma Care

Adherence
- Nationally and locally, young children receive inadequate therapy
- Parents underestimate their child’s symptoms
- Providers underestimate the severity of symptoms
- Many children experience poor symptom control despite use of preventive medications

What We (and Others) Have Found
Impact on Schools and Families

- Missed school days
- Inadequate restful sleep
- Activity limitation
- Impaired social interactions, play, and development
- Risk for poor school performance

Caregivers experience:
- Stress, depression, lower quality of life
- Missed work

Guiding Question:

How to improve the asthma care delivery system to help children receive and benefit from the guideline-based recommended standard of preventive care?

School-Based Programs Reach Children in Need

- Identify children suffering from asthma in the setting where they routinely spend much of their day
- Collaboration with schools provides the ability to proactively and preventively treat high-risk children
**Relationship with Rochester City School District**

Early on, Pre-K screening (Children’s Institute, PACE survey) followed by collaboration to prepare and test interventions within Rochester City School District (RCSD) once asthma prevalence was better understood

- HIPAA and FERPA compliant Memorandum of Understanding developed between RCSD legal and URMC IRB
- Allows Medi-Alert related asthma / breathing problems data to be shared
- Used for routine and systemic NHLBI guideline-based asthma severity / control screening

**Early Work with RCSD**

School-Based Asthma Therapy (SBAT), 2006-09

- Preventive medications administered at school (DOT)
- Symptom-based dose adjustments
- Home-based tobacco smoke reduction program

**Results:**
- 530 children (3-10yo) enrolled from 54 schools
- Collected symptom information, absenteeism, emergency visits, hospitalizations
- Measured smoke exposure and lung inflammation

**School-Based Care: Outcomes**

Children receiving school-based asthma care (Directly Observed Therapy) routinely experience less morbidity, fewer symptoms and improved breathing outcomes

- More symptom-free days
- Fewer nighttime symptoms
- Fewer limits on activity
- Less rescue medication use
- Less need for acute visits
- Reduced airway inflammation
Benefits of School Nurse Involvement

- Monitor child’s breathing / asthma symptoms daily
- Promote improved self-management
- Ensure proper administration technique
- Medication use clarification – rescue vs. controller
- Support child’s healthy habits and routines related to asthma self-care
- School nurse establishes a relationship with and gets to know child

DOT Primary Outcomes

Peer Reviewed Research Publications

- Benefits of a School-Based Asthma Treatment Program in the Absence of Secondhand Smoke Exposure: Results of a Randomized Clinical Trial. Archives of Pediatrics and Adolescent Medicine, 2004; 158:460-467
- Randomized Controlled Trial to Improve Care for Urban Children with Asthma. Archives of Pediatrics and Adolescent Medicine, 2011; 165:262-268
- The School-Based Preventive Asthma Care Trial: Results of a Pilot Study. Journal of Pediatrics, 2012; 160(1):119-125
- Effect of the School-Based Telemedicine Enhanced Asthma Management (SB-TEAM) Program on Asthma Morbidity: A Randomized Clinical Trial. JAMA Pediatrics, 2018; Epub 2018 Jan 08

2018-2019 School Year

<table>
<thead>
<tr>
<th>Program</th>
<th>Who is eligible</th>
<th>Ages</th>
<th>School referrals</th>
<th>Interventions</th>
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<tbody>
<tr>
<td>SB-ACT YR 5</td>
<td>Persistent asthma, Enrolled Fall/Winter, metro Rochester</td>
<td>12-16</td>
<td>YES</td>
<td>Asthma Education, School DOT, or MI and School DOT</td>
</tr>
<tr>
<td>TEAM-ED</td>
<td>Persistent asthma, Enrolled in ED, ongoing, metro Rochester</td>
<td>3-12</td>
<td>NO</td>
<td>Telemedicine visits (3) at school completed by Primary Care</td>
</tr>
<tr>
<td>TEAM-UP YR 1</td>
<td>Mod./Severe Persistent, Enrolled Fall/Winter, metro Rochester</td>
<td>4-12</td>
<td>YES</td>
<td>DOT and Telemedicine visits (3) at school completed by Asthma Specialist</td>
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Implementation: Identifying Children

NHLBI guidelines: Level of control is based on the single most severe component of Impairment or Risk

**Methods**
NHLBI pediatric control assessment criteria language adapted for screening

ANY single response in the BLUE indicates asthma that is poorly controlled

**Impairment Component of Control:**

<table>
<thead>
<tr>
<th>During the past month (4 weeks), how often did your child have coughing, wheezing, or shortness of breath during the day?</th>
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<tbody>
<tr>
<td>Never</td>
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<tr>
<td>1x/week or less</td>
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<tr>
<td>2x/week or more</td>
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<tr>
<td>Throughout the day</td>
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<table>
<thead>
<tr>
<th>During the past month (4 weeks), how often did your child wake up during the night because of asthma symptoms (wheezing, difficulty breathing)?</th>
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<tbody>
<tr>
<td>Never</td>
</tr>
<tr>
<td>1x/month or more</td>
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<tr>
<td>2x/month or more</td>
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<tr>
<td>2x/week or more</td>
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<tr>
<th>During the past month (4 weeks), how much did your child's asthma limit or interfere with normal activity, would you say your child has?</th>
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<tbody>
<tr>
<td>None, no limitation</td>
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<tr>
<td>Minor limitation</td>
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<tr>
<td>Some limitation</td>
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<tr>
<td>Extreme limitation</td>
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<tr>
<th>During the past month (4 weeks), how often has your child had to use a rescue medication (e.g. albuterol or Ventolin) to help relieve asthma symptoms?</th>
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<tbody>
<tr>
<td>Never</td>
</tr>
<tr>
<td>1x/2 days/week or less</td>
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<tr>
<td>&gt;2 days/week or more</td>
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<tr>
<td>Several times per day</td>
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**Risk Component of Control:**

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<thead>
<tr>
<th>Is the past year, how many times did your child have an asthma exacerbation that required oral systemic steroids?</th>
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<tbody>
<tr>
<td>None in the past year</td>
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<tr>
<td>1x/year</td>
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<tr>
<td>2-3x/year</td>
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<tr>
<td>&gt;3x/year</td>
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**Is the Child’s Asthma Well Controlled?**

National Association of School Nurses (NASN) assessment tool was adapted to be used by school nurses for program referrals
Clinical rationale provided to PCP to support enrollment and DOT referral

Provider Authorization request for the recommended ICS preventive medication administered as DOT at school

Home Delivery Checklist for initial DOT medication review and teaching
Adaptation, Process, and Willingness

To meet families where they are, without judgement, to best serve child health

Problem solving and creative work-arounds with each iteration of DOT implementation tested

How to intervene in the trigger rich environments (TSE, poor quality housing, etc.) our families live in?

What may make Rochester somewhat unique?

How school-based therapy could (and does) look elsewhere?

RCSD School Health Services

- 33,000 students in city of Rochester, NY
- Serving nearly 90 public, charter, and non-public schools
- Staff (FTE) includes: 40 RNs, 20 LPNs, and 42 unlicensed School Health Aides

Framework for 21st Century School Nursing Practice™
School Nurse Champions for Asthma Care

- Advocate for students/families with asthma
- Represent school nurses, health aides and schools
- Gather questions and concerns
- Promote school asthma research
- Outreach to identify and refer students
- Review key study communications
- Assist asthma study leadership with remaining current on RCSD school asthma policies, practices, and requirements

Sustainability and Future Directions

School-based therapy implementation nationally
Expanding the use / role of telemedicine
Enhanced specialist care
Funding mechanisms to consider
School Nurses with EMR access and functionality

School-Based Asthma Therapy Nationally
School-Based Asthma Therapy Initiatives

- New York City, NY, Dept. of Health
- Columbus, Ohio, Nationwide Children’s
- Denver, CO, public school system
- Washington, DC, metro schools
- Hartford, CT, public schools
- Buffalo, NY, school-based health clinics
- Philadelphia, PA, Children’s Hospital of Philadelphia
- Baltimore MD, Johns Hopkins and City Health Dept.
- National Association of School Nurses (NASN) - School Nurse

Evidence-Based Clinical Guidelines for Asthma

Summary

Despite the existence of guidelines to direct the standard of asthma care, treatment adherence is often suboptimal.

School-Based Directly Observed Therapy (DOT) for poorly controlled asthma improves morbidity outcomes for urban children across many measures.

DOT implementation as a public health intervention can be accomplished using available school and community resources.

Thank You to Our Partners / Collaborators!

- Rochester families and child participants
- Rochester City School District and School Health Services
- Children’s Institute
- Halcyon Hill Foundation
- Robert Wood Johnson Foundation
- National Association of School Nurses
- National Heart, Lung, and Blood Institute
- American Academy of Allergy Asthma and Immunology
Expanding Use of Telemedicine

Telemedicine allows for tailoring of care and improves access for chronic illness management

- Telemedicine allows clinicians to conduct assessment and provide consultation remotely
- Eliminates barriers to care by making it possible for a healthcare visit to be accomplished while child remains at school, parent remains at home/work and provider stays put
- Reimbursement for telemedicine and evidence supporting its utility increasingly makes this technology a sustainable system of care

SB-ACT | Final Year 5

School-Based Asthma Care for Teens, 2014-2019

Objective: To test the effectiveness of SB-ACT in improving daily preventive medication adherence and in reducing morbidity among urban teens with persistent or poorly controlled asthma.

Enroll 430 teens (12-16yo) over 5 school years; follow families for 12 months

Three group randomized controlled trial:
- SB-ACT (DOT + MI): trial of DOT of daily preventive medications with school-based administration for 6 to 8+ weeks plus 3 Motivational Interviewing (MI) behavior change counseling sessions to promote teens’ self-management and adherence to preventive medications
- DOT only: DOT for 6 to 8+ weeks (no counseling)
- Asthma Education (AE) only: American Lung Association’s Kickin’ Asthma curriculum adapted to individual sessions and matched to MI counseling for time/attention

TEAM-ED | Ongoing

Telemedicine Enhanced Asthma Management through the Emergency Department, 2016-20

Objective: To test whether using telemedicine to link children to guideline-based primary care after an asthma ED visit will help children reduce mortality and future acuity.

Enroll 430 children (3-12yo) over 4 years; follow families for 1 year

Randomized controlled trial:
- ED-based screening/enrollment: Direct school referrals are NOT possible
- Intervention: telemedicine visits (initial < 1 week after ED visit plus two follow-ups) for tailoring NHLBI guideline-based preventive asthma care
- Usual care comparison (Control) group
TEAM-UP | Year 1

Telemedicine Enhanced Asthma Management - Uniting Providers

Objective: To test whether primary care directed DOT plus specialist-supported asthma care using telemedicine will help children experience reduced morbidity and improve guideline-based care.

Enroll 360 children (4-12yo) over 4 school years; follow families for 1 year

Randomized controlled trial:
- Screening: School Nurse/PCP referrals, Med-Alerts
- Identify high risk children with moderate/severe persistent or difficult to control asthma
- PCPs of all enrolled children prompted to initiate school-based DOT of daily preventive medication and refer to an asthma specialist
- Intervention: Telemedicine specialist visits at school (initial 4 weeks after DOT begins, plus two follow-up visits)

Objective:
To test whether primary care directed DOT plus specialist-supported asthma care using telemedicine will help children experience reduced morbidity and improve guideline-based care.

Role of School Health Staff

Help students with their medications each day, monitor their breathing, teach about guided self-management and in turn improve asthma control for many.
- Help identify students with asthma symptoms
- Refer or screen students for eligibility
- Continue to allow us to complete assessments, to provide education/counseling and to prepare telemedicine
- Administer preventive medications each school day and monitor breathing
- Ensure good administration technique
- Teach students about early warning signs and avoiding triggers
- Communicate with parents to coordinate appropriate asthma care