Expanding Roles in Respiratory Therapy: RT’s Role in Patient Centered Outcomes Research

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Disclosure
I have no actual or potential conflict of interest in relation to this program and/or presentation.
Respiratory Therapy

Future Needs:

• **Leaders**: plan and deliver cost effective health care services
• **Faculty**: College and University based respiratory care education programs
• **Advanced Practice RT’s**: Advanced knowledge and skills
• **Research/Scientists**: Provide a link between basic science, clinical research, and practice.
  • Increase knowledge within our discipline
  • Publish: Acknowledgement
Research/Scientists

- Develop appropriate research questions
  - Fill a gap in our current knowledge
  - Have an impact on a specific population
- Formulate hypotheses
- Build a solid research design
- Conduct the study/intervention
- Collect and analyze the data
- Report your findings (Publish)

*Research Involving Interdisciplinary Collaboration*
Research: Interdisciplinary Collaboration?

Interdisciplinary collaboration:

• Preventive Medicine
• Cancer Survivors
• Sports Medicine
• Dietetics and Nutrition
• Pulmonary Medicine

** Respiratory Therapists can add expertise to the scientific community**
Real Life Example: Patient Centered Outcomes Research

Interdisciplinary Collaboration

Patient Centered Outcomes Research

Patient Centered Outcomes Research is Guided by:

a. Physicians
b. Scientists/Researchers
c. Caregivers
d. Community Stakeholders
e. Patients
Patient Centered Outcomes Research:

Mission

The Patient-Centered Outcomes Research Institute (PCORI) helps people make informed healthcare decisions, and improves healthcare delivery and outcomes, by producing and promoting high integrity, evidence-based information that comes from research guided by patients, caregivers and the broader healthcare community.

http://www.pcori.org

The Gap: Problem

- Approximately 25.9 million Americans (including 7.1 million children) had asthma in 2011.

- Annual economic cost of asthma in the U.S. was $56.0 billion; direct health care costs consisted of $50.1 billion with indirect costs (lost productivity) contributing an additional $5.9 billion. (ALA, 2012)

- In North America between 21-35% of asthma patients admitted to the hospital will relapse within 3 weeks.

National Health Interview Survey, National Center for Health Statistics, CDC. 2011
Asthma Burden in Kansas

- 8.4% (174,713) Adults
- 8.3% Children
- 300 Deaths annually
Asthma Burden in Kansas
Report from the Literature

- Rural Not less than urban:
  - Similar to previous study (Morrison et al)
- Morbidity higher in rural (Pesek et al)
  - Suggest that lack of access to care and poorer access to health care information (Ownby et al)


Rural Barriers

- Patients with asthma in rural areas and small towns:
  - More likely to visit ED or hospital due to uncontrolled asthma than their urban counterparts. (Valet et al)
  - Less likely to receive evidence based asthma care. (Valet et al)
  - Clinicians may not adhere to use of the evidence based guidelines for asthma care.
    - Programs to improve clinician adherence to these guidelines have focused on urban health care centers. (Cloutier et al)

Solution to the Problem

Even though we have evidence based guidelines for the diagnosis and treatment of asthma, it has been reported that there is poor adherence among both clinicians and patients.
Research Question: Fills a gap in the field

Example: Can we improve clinician and patient adherence to guidelines for asthma care?

Also, a need to:
~ Improve morbidity and mortality in rural populations
~ Decrease health care utilization

Aim #1: Determine the effectiveness of a CE intervention/program in rural Kansas PCP clinics.
Hypothesis: We can improve clinician adherence for the use of 3 key components of asthma diagnosis and treatment guidelines.

Aim #2: Determine the effectiveness of a web-based asthma self-management program on asthma patients in rural Kansas.
Hypothesis: We can improve asthma control, QoL, and health care utilization in patients with uncontrolled asthma.
Partnership in Asthma Care
Clinic Practices

Solution to the Problem

Aim #1: Determine the effectiveness of a CE intervention/program in rural Kansas PCP clinics.

Hypothesis: *We can improve clinician adherence for the use of 3 key components of asthma diagnosis and treatment guidelines.*
**Partnership in Asthma Care**

**Can it Work?**  
*(Primary Care Clinics)*

- High Plains Research Network (HPRN) ~ Clinicians in rural eastern Colorado significantly increased main components of evidence based-guidelines:
  - Spirometry use for diagnosis
  - Prescription of ICS for treatment
  - Use of Asthma Action Plan for self-management


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**Clinical Practice Behavior Change for use of Evidence Based Guidelines**

% of patients receiving:

1) ICS
2) Asthma Action Plan
3) Spirometry
Clinical Practice Behavior Change for use of Evidence Based Guidelines

<table>
<thead>
<tr>
<th></th>
<th>Before Intervention</th>
<th>After Intervention</th>
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<tbody>
<tr>
<td></td>
<td>Median</td>
<td>Interquartile Range</td>
<td>Median</td>
</tr>
<tr>
<td>Using inhaled corticosteroid (%)</td>
<td>25.0</td>
<td>70.0</td>
<td>50.0</td>
</tr>
<tr>
<td>Patients with an action plan (%)</td>
<td>0.0</td>
<td>10.0</td>
<td>20.0</td>
</tr>
<tr>
<td>Patients with Spironolactone (%)</td>
<td>0.0</td>
<td>0.5</td>
<td>40.0</td>
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Partnership in Asthma Care Patients
4 Key Components to the Diagnosis and Management of the Asthma Patient

- **Component 1:** Measures of Assessment and Monitoring
- **Component 2:** Control of Factors Contributing to Asthma Severity
- **Component 3:** Pharmacologic Therapy
- **Component 4:** Education for a Partnership in Asthma Care

Explain the two main types of asthma medications:
1) long-term control meds
2) short-acting quick relief meds

* Teach proper technique for taking inhaled meds with delivery device.

Review all asthma medications and proper use of inhaled medications and delivery device.

Self-monitoring skills for recognizing the intensity and frequency of symptoms. Teach proper use of peak flow monitor.

Cover all relevant environmental control/avoidance strategies - home and work exposures that can worsen asthma.

Make sure patient understands the written asthma action plan and can self-adjust treatment as needed.

Confirm that patient knows what to do if asthma gets worse and doesn’t respond to treatment.

<table>
<thead>
<tr>
<th>Education Visit #1</th>
<th>Education Visit #2</th>
<th>Education Visit #3</th>
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<tbody>
<tr>
<td>Explain asthma and its effect on airways.</td>
<td>Review proper use of a peak flow meter.</td>
<td>Review self-assessment of asthma control.</td>
</tr>
<tr>
<td>Definition of asthma control: controlling daytime and nighttime symptoms, ability to perform normal activities, and normal lung function.</td>
<td>Self-assessment of asthma control using symptoms and peak flow meter as a guide.</td>
<td>Review proper use of medications and delivery device.</td>
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<td>Review the use of the written asthma action plan and adjust as needed.</td>
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Partnership in Asthma Care
Asthma Self-management In Rural Kansas

- Must be able to disseminate evidence based guidelines to a large number of people with asthma in a vast geographical area
- Must be able to be highly accessible
- Must be affordable health care
- Health information must be appealing to rural residents

Aim #2: Determine the effectiveness of a web-based asthma self-management program on asthma patients in rural Kansas.

Hypothesis: We can improve asthma control, QoL, and health care utilization in patients with uncontrolled asthma.
Partnership in Asthma Care
Patient self-management
(Does it work with Patients)?

- Educational partnership between the clinician and the patient for delivering asthma self-management skills. (empowerment)

- A large review by Gibson et al. reported that RCT’s using patient self-management have shown to be effective at improving asthma control in adults. (36 studies; n = 4,593)

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Web-based Asthma Self-management:
Can it Work?
(Patients)

- Shown to be preferred over paper based. (Cruz-Correia et al.)

- Significantly greater improvement in asthma symptoms and QoL versus office based. (Rassmussen et al.)

More Advantages:

- Convenient (Travel, no repeated visits)
- Access to specialty care providers

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What is left to do?

Building a Rural Community Partnership

- **Objective**: Determine the effectiveness of CE/PD and a web-based Asthma Prevention Program aimed at improving asthma control within rural Kansas community settings.
- **Hypothesis**: (1) Rural Kansas PCP’s will increase adherence to evidence based guidelines for asthma care and (2) Patients with asthma, in rural Kansas communities, will experience clinically meaningful improvements in asthma control.
- **Rationale**: We can assess the impact of a rural community Asthma Prevention Program on reducing the burden of asthma in Kansas.
- **Long-term goal**: Develop an effective strategy for providing office-based education in PCP clinics and a web-based Asthma Prevention Program for asthma patients, while establishing rural community partnerships in order to have a positive impact on asthma patients throughout the state of Kansas.

[http://www.kumc.edu/school-of-medicine/asthma-center/outreach.html](http://www.kumc.edu/school-of-medicine/asthma-center/outreach.html)
Asthma Initiative: Stepwise Process

Asthma Registry

Feasibility and Effectiveness of Asthma Prevention Program in Clinical Practice

Asthma Prevention: Statewide Initiative
- Develop community advisory committee
- Expert panel: review educational content

Asthma Prevention: Statewide Initiative
- CME and CRCE in community hospitals and PCP offices
  - Adhere to Evidence Based Guidelines (EPR3)
  - Web-based patient asthma self-management tool

EPR-3 Guideline Adherence
Proportion of asthma patients who receive:
- Spirometry
- Asthma Action Plan
- Controller medications

Baseline: Collect from electronic survey of PCP’s

Post education: 3 months after final intensive teleconference
Baseline
After clinical practice completes all intensive training:
• Asthma Control Questionnaire
• Asthma Quality of Life Questionnaire
• Spirometry
• ED Visits
• Hospital Admits
• Unplanned Physician Appointments

RCT

Clinical Practice alone
Clinical Practice + Web-based Asthma COACH™

1 Year Repeated Measures
• Within Group
• Between Group Comparison

Asthma Self-management
EPR-3 Guidelines Statement:

Respiratory therapists provide asthma education in hospital, ED, and clinic settings and may direct clinical pathways and algorithms in hospital settings.

However, there are no published RCTs of asthma education programs delivered by respiratory therapists.

You Interested??
Another Area of Clinical Research Involving Interdisciplinary Collaboration.

Sooo Excited!!!!

Exercise Induced Bronchospasm

- EIB consists of airway narrowing occurring with exercise.
- Commonly occurs after exercise has ceased.
- EIB very common trigger in asthmatics.
  - occurs in 80-90% of those with asthma.
- Present in 10% of general population without known history of asthma.

EIB in Athletes

Prevalence
Olympic athletes have been reported to be as much as five times greater than that of the general population.

PARBONS, J. P., C. KAEDING, C. PHILLIPS, D. JARJOURA, C. WADLEY, and J. O.

OSU Study
College Athletes

• 107 athletes in 22 different sports
• 42 of 107 tested positive = 39% !!!
• Of the 42 testing positive 36 had NO known history of asthma
EIB Morbidity and Mortality

Marquan Johnson

Increased Morbidity and Mortality

Morbidity:
- Increased respiratory tract infections and airway remodeling.

Mortality (EIA and deaths)
- 7 year study revealed 61 deaths (93-2000)
  - 81% < 21 years old
  - 3% > 31 years old

What is the most likely cause of EIB?

A. Deconditioning  
B. Allergic response  
C. Airway drying and cooling  
D. Stress induced by exercise

Pathophysiology

- Airway drying and cooling (heat evaporation)  
- Mast cell mediators (immune response) 
  - histamine  
  - leukotrienes  
  - prostaglandins  
- Irritant receptors affecting the vagal nerve
You are seeing a 17 year old high school long distance runner who complains of unusual SOB, coughing, and chest tightness after exercise. A test to help you most likely establish a diagnosis is:

A. Methacholine challenge  
B. Pre/Post bronchodilator  
C. WPF in the field  
D. Treadmill exercise provocation test  
E. Eucapnic Voluntary hyperventilation
Methodology: Testing

Student Athletes

Questionnaire and Spirometry

Exclude:
< 70% FEV1

EIA TESTING

Methods

Questionnaire
(US Olympic Committee Sports Medicine Division)
- Respiratory symptoms during exercise
  - wheezing
  - dyspnea
  - chest pain

(compare symptoms to positive test)
Spirometry
Baseline Spirometry

ATS Standards:
• 3 acceptable efforts
• At least 2 efforts within 150ml of each other
• Exhalation > 6 seconds
• Volume plateau
• No variable flow or coughing
• No abrupt end of test

Must be greater than 70% of predicted

Test Protocol (General)

• Reach 80-90% of predicted HR (220-age)
• Want to see VE 40-60% of MVV
  - calculated by 35 x FEV1
• Do so within 2-4 minutes from start
• Continue exercise test for 4-6 minutes after reaching target HR and/or VE

• (If subject tolerates exercise in target range, intensity can increase to reach maximal effort. Goal is to have subject at target level at least 4 minutes total within 8 minutes from start of test).
Test Protocol (Spirometry)

- After EIB test perform spirometry:
  1. 2 minutes post exercise
  2. 5 minutes post
  3. 10 minutes post
  4. 15 minutes post
  5. 30 minutes post

Or if the FEV1 falls by ≥ 10%
Generally, who has the most experience and expertise with EIB diagnosis and treatment?

A. EMT  
B. Nurse  
C. PT  
D. OT  
E. RT
Even with Guidelines for the diagnosis and treatment of EIB: athletic trainers, clinicians and athletes are not adhering to the guidelines.

You tell me what the future direction for RT’s can be: To have an impact on this patient population?

QUESTIONS?

Asthma Care in:
Kansas City……

And KANSAS
Eucapnic Voluntary Hyperventilation

http://www.youtube.com/watch?v=3kkI0qG--7o