

Integrating Asthma Environmental Education Into the Electronic Health Record Case Study: Children's Hospital of Philadelphia CARE Network

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Objectives

- ▶ Discuss Primary Care Provider Education—barriers and facilitators
- ▶ Discuss Clinical Decision Support
 - Definition
 - How CDS influences care
 - Electronic Health Record integration
- ▶ Describe Asthma Care Assistant
- ▶ Describe Asthma Environmental Education module project
- ▶ Demonstrate EHR tool and outcomes

The State of Asthma Care by Primary Care Providers

- ▶ Over a 9 year period, visits for asthma to generalists increased whereas those to specialists decreased. (*Freed.Jped.s.2005*)
- ▶ Multiple studies show care provided by specialists is more likely to be consistent with guidelines than when provided by generalists. (*Diette.Pediatrics.2001*)
- ▶ Asthma-experienced generalists have patients with better outcomes than generalists:
 - Less cancelled activities
 - Less emergency or hospital visits
 - Less missed work days
 - (*Wu et al. Arch Intern Med.2001*)

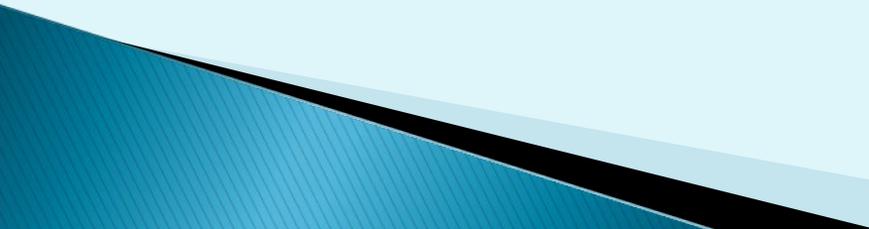
Barriers to physician adherence to practice guidelines

- ▶ Knowledge
 - Lack of familiarity
 - Volume of information
 - Time needed to stay informed
 - Guideline accessibility
- ▶ Attitudes
 - Lack of agreement with specific guidelines– interpretation, applicability, cost–beneficial, lack of confidence in guideline developer
 - Lack of self–efficacy (don't have time to perform it)
 - Lack of motivation (it's too hard and I'm too busy)
 - Lack of outcome expectancy (my patients will do what they want)

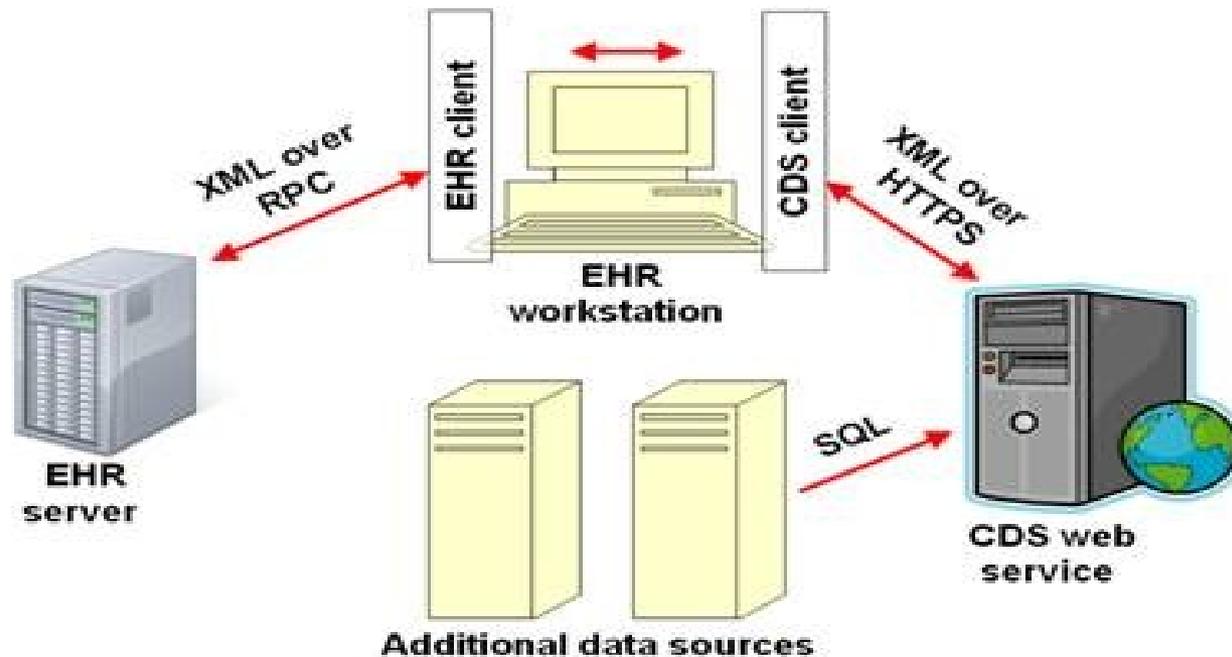
Why Clinical Decision Support?

- ▶ It takes an average of five years for guidelines to be adopted into routine practice for primary care physicians
- ▶ Specialists usually have quicker uptake of guidelines
- ▶ Clinical Decision Support can improve performance of guidelines
 - not always effectively integrated into care

Clinical Decision Support System (CDSS)

- ▶ Active knowledge systems which use two or more patient specific data points to generate case specific advice
 - ▶ Main purpose is to assist clinicians at point of care
 - ▶ Most likely to improve outcomes if it is matched to the model of decision-making favored by clinicians and families in a particular situation.
- 

CDS Data Flow. Data flow between components in the web-service framework for the clinician-based decision support. Connection between the electronic health record (EHR) and CDS occurs on the EHR workstation rather than a server-to-server interface.



Challenges for CDSS

- ▶ Raising awareness for need of test or procedure
- ▶ Delivering adequate information to address decision making needs
- ▶ Effectively sharing knowledge based on preferences and goals of clinician and patient
 - Varies across health conditions, decisions and contexts

Ten commandments for effective clinical decision support

- ▶ Speed is everything
- ▶ Anticipate needs and deliver in real time
- ▶ Fit into the user's workflow
- ▶ Little things can make a big difference
- ▶ Recognize that physicians will strongly resist stopping
- ▶ Changing directions is easier than stopping
- ▶ Simple Interventions work best
- ▶ Ask for additional information only when you really need it
- ▶ Monitor impact, get feedback and respond
- ▶ Manage and Maintain your knowledge-based systems

CHOP CARE Network

Characteristics



- ▶ Has 29 primary care practices, four which serve inner-city disadvantaged populations primarily
- ▶ Within the four sites there are ~ 40,000 patients
 - ~ 20% children have been diagnosed with asthma= 8000 potential patients
- ▶ Each practice has a physician and nurse asthma champion- monthly meetings
- ▶ Has an electronic health record(EHR) for which asthma has been the “prototype” disease which has resulted in the asthma care assistant- a one-stop shop for asthma information and management for physicians and nurse practitioners

Asthma Environmental Education Program

▶ Objective

- To improve environmental education for asthma control in inner city primary care practices

▶ Methodology

- 1) Pcp training through lecture series
- 2) Creation of education module in EHR
- 3) Promote utilization of EHR with monitoring and feedback

▶ Outcomes

- Utilization of EHR measured at baseline (6 months after education module goes live) and at completion (12 months) after education module goes live
- Enroll caregivers to determine whether education changes behaviors at enrollment and 12 months post enrollment

Intervention Design



Lecture Content

- ▶ Adapted from NEEFA and national asthma guidelines
- ▶ Used case studies – completed over two large meetings and two practice meetings
- ▶ Impact on asthma of:
 - Indoor allergens
 - Indoor irritants/pollutants
 - Outdoor allergens
 - Outdoor pollutants
- ▶ Avoidance and mitigation techniques
- ▶ Communication techniques for discussing environmental triggers
- ▶ Utilization of education module in electronic health record

Example Case Study

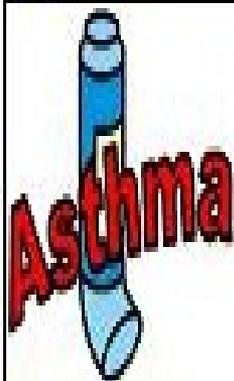
- ▶ Mary Z is a 16 yo female who has history of persistent asthma. She is here for her f/u visit after being hospitalized.
- ▶ You complete her asthma control tool. Mary coughs at least 2x/wk at night. She also has symptoms with exercise and she has missed school
- ▶ She is taking her controller medicine daily but still needs to use her rescue medicine twice a week.
- ▶ What else do you need to know?

Electronic Health Record and asthma care assistant modifications



No immunizations are due

Manually review immunization history and guidelines to determine if a second dose of **Influenza** vaccine is required



[Office Neb](#)

[Billing](#)

[Asthma PFE](#)

 **Control Tool:** [10/20/2010 \(click to file new form\)](#)

 **Severity:** Intermittent ([problem list noted 11/15/2006](#))

 **Tests:** [Spirometry: not on file](#)

 **ED/Hospital:** Last 6 months: Emergency: 0 ([last: 11/07/2009](#))

 **Medication:** [On treatment step #3: medium-dose ICS \(click for Asthma SmartSet\)](#)

 **Care Plan:** [04/24/2010 \(click to access form\)](#)

 **Education:** [not on file \(click to file new form\)](#)

Asthma Control Tool

[Epic](#)
[Home](#)
[Test, Andrew](#)

Test, Andrew 4 year old Male MRN: 31002206 Allergies/Rxn: Egg, Milk (cow's), Chocolate* PCP: GRUNDMEIER, ROBERT INSURANCE: (None)

Care Assistant

Asthma Control Tool						
Over the past month:	0	1x	2x	3x	4x	5 or more
How many asthma flares did your child have? <i>An asthma flare is an increase in symptoms of asthma for more than a day.</i>	<input checked="" type="radio"/>	<input type="radio"/>				
How often did your child have asthma symptoms causing your child to miss school or daycare?	<input checked="" type="radio"/>	<input type="radio"/>				

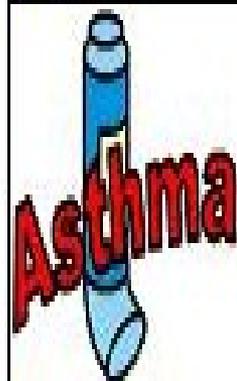
Over the past month:	Never	1 or 2 times per month	1 or 2 times per week	Every other day	Every day	More than once a day
How often did your child have asthma symptoms with activity (play, exercise, running, sports)?	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
How often did your child have asthma symptoms while asleep at night?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
How often did your child need to take their albuterol (quick relief medicine) for asthma symptoms?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>

Over the past month:	Excellent	Good	Fair	Poor
How would you rate your child's asthma control?	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
How would you rate your comfort level with managing your child's asthma?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Over the past year:	0	1x	2x	3x	4x	5 or more
How many times did your child require visits to an Emergency Room or an Urgent Care Center for asthma?	<input type="radio"/>					
How many times did your child require a Hospital admission for asthma?	<input type="radio"/>					
How many times did your child start a steroid medicine by mouth for asthma? <i>(such as - Prednisone, Prelone, Orapred, or Pediapred)</i>	<input type="radio"/>					

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Manually review immunization history and guidelines to determine if a second dose of **Influenza** vaccine is required



[Office Neb](#)

[Billing](#)

[Asthma PFE](#)

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⊕ **Medication:** [On treatment step #3: medium-dose ICS \(click for Asthma SmartSet\)](#)

⊕ **Care Plan:** [04/24/2010 \(click to access form\)](#)

⊖ **Education:** [not on file \(click to file new form\)](#)

Asthma Care Plan

GREEN ZONE

Give these medicines everyday:



Give these controller (anti-inflammatory) medicines everyday, to prevent problems. Even when you/your child is well!

Medicine	How much?	How often?
Flovent Inhaler 110 mcg with a spacer	1 puff inhaled	2 times a day
<ul style="list-style-type: none"> • Rinse mouth after giving inhaled medications. Give a sip of water, swish it out or brush teeth. • Make sure to refill control medications before they run out, usually they last one month. 		

Give these medicines if you have trouble breathing with exercise:

Medicine	How much?	How often?
Albuterol inhaler with a spacer	2 puffs inhaled	15-30 minutes before exercise

YELLOW ZONE

Give these medicines when symptoms start:



For cough, wheeze, shortness of breath, chest tightness or chest pain use a quick-relief (bronchodilator) medicine:

Medicine	How much?	How often?
Albuterol inhaler with a spacer	4 puffs inhaled	up to every 4 hours as needed

- If symptoms **are not better** after 20 minutes, give the quick relief medicine once more. If symptoms are STILL not better go immediately to the RED ZONE
- IF QUICK RELIEF MEDICINE IS NEEDED MORE THAN ONCE A DAY YOU ARE HAVING

You can now print out your asthma care plan with the graphics! Yes!

Documenting Using Care Assistant

Care Assistant

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- ⊖ **Education:** [not on file \(click to file new form\)](#)

- Snapshot
- Chart Review
- Flowsheets
- Doc Flowsheets
- Problem List
- History
- Letters
- Demographics
- Growth Chart
- Results Review
- Medications
- Allergies/Rxn
- Enter/Edit Resul...
- Audiogram
- Patient Files
- Order Entry
- Immunizations
- Visit Navigator

Care Assistant

Care Assistant ? Close X

<p>EDUCATION MODULES</p> <p><input type="checkbox"/> basic asthma facts (PFE English Spanish) <input type="text"/></p> <p><input type="checkbox"/> roles of controller medications <input type="text"/></p> <p><input type="checkbox"/> roles of quick-relief medications <input type="text"/></p> <p><input type="checkbox"/> school, sports and physical activity issues <input type="text"/></p> <p>SKILLS CHECK</p> <p><input type="checkbox"/> inhaler use (spacer & mask PFE English Spanish) <input type="text"/> (spacer & mouthpiece PFE English Spanish) (diskus PFE English Spanish)</p> <p><input type="checkbox"/> spacer use <input type="text"/></p> <p><input type="checkbox"/> symptom monitoring <input type="text"/></p> <p><input type="checkbox"/> peak flow monitoring (PFE English Spanish) <input type="text"/></p> <p><input type="checkbox"/> recognizing early signs of deterioration <input type="text"/></p> <p><input type="checkbox"/> when and where to seek care <input type="text"/></p> <p><input type="checkbox"/> when and how to take rescue actions <input type="text"/></p> <p><input type="checkbox"/> use of asthma care plan (PFE English Spanish) <input type="text"/></p> <p>COCKROACH/PEST AVOIDANCE (PFE English Spanish)</p> <p><input checked="" type="checkbox"/> keep trash closed <input type="text" value="11/16/2011"/></p> <p><input checked="" type="checkbox"/> keep food in closed containers <input type="text" value="11/16/2011"/></p> <p><input checked="" type="checkbox"/> use roach/mice bait-keep out of child's reach <input type="text" value="11/16/2011"/></p>	<p>ENVIRONMENTAL CONTROL (PFE English Spanish)</p> <p>Pet Avoidance Measures (PFE English)</p> <p><input checked="" type="checkbox"/> give furry pet or bird to family member/friend who does not live in your home <input type="text" value="11/16/2011"/></p> <p><input checked="" type="checkbox"/> keep pets off furniture, wipe furniture with wet cloth every week <input type="text" value="11/16/2011"/></p> <p><input checked="" type="checkbox"/> keep pets out of child's bedroom <input type="text" value="11/16/2011"/></p> <p>Dust Avoidance Measures (PFE English)</p> <p><input checked="" type="checkbox"/> place dust mite covers on mattress/pillows <input type="text" value="11/16/2011"/></p> <p><input checked="" type="checkbox"/> remove fabric window coverings, feather or wool bedding <input type="text" value="11/16/2011"/></p> <p><input checked="" type="checkbox"/> vacuum at least once a week <input type="text" value="11/16/2011"/></p> <p><input type="checkbox"/> dust with damp cloth <input type="text"/></p> <p>Mold Avoidance Measures (PFE English)</p> <p><input checked="" type="checkbox"/> fix leaks <input type="text" value="11/16/2011"/></p> <p><input checked="" type="checkbox"/> remove visible mold from home <input type="text" value="11/16/2011"/></p> <p><input checked="" type="checkbox"/> use air conditioner and dehumidifier if possible <input type="text" value="11/16/2011"/></p> <p><input checked="" type="checkbox"/> remove indoor plants <input type="text" value="11/16/2011"/></p> <p>Secondhand Smoke Avoidance (PFE English)</p> <p><input checked="" type="checkbox"/> don't allow smoking in the house <input type="text" value="11/16/2011"/></p> <p><input checked="" type="checkbox"/> don't allow smoking in the car <input type="text" value="11/16/2011"/></p>
-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

COCKROACHES



Cockroaches are one of the most common and allergenic of indoor pests. Recent studies have found a strong association between the presence of cockroaches and increases in the severity of asthma symptoms in individuals who are sensitive to cockroach allergens. These pests are common even in the cleanest of crowded urban areas and older dwellings. They are found in all types of neighborhoods. The proteins found in cockroach saliva are particularly allergenic but the body and droppings of cockroaches also contain allergenic proteins.

Preventive Strategies

- Limit the spread of food around the house and especially keep food out of bedrooms.
- Keep food and garbage in closed, tight-lidded containers. Never leave food out in the kitchen.
- Do not leave out pet food or dirty food bowls.
- Mop the kitchen floor and wash countertops at least once a week.
- Eliminate water sources that attract these pests, such as leaky faucets and drain pipes.
- Plug up crevices around the house through which cockroaches can enter.
- Use bait stations and other environmentally safe pesticides to reduce cockroach infestation.

Zzzepicare, Bravo

16 year old MRN: 00951343 Allergies/Rxn MDRQ PCP INSURANCE My Chart
 Male DOB 1/2/1995 Bananas, Strawberry, Pollen * (None) (None) Inactive

SnapShot

11/16/2011 visit with Tyra Bryant-Stephens, MD for Office Visit

? Resize

Chart Review

Images Admin Asthma CP Open Orders Print AVS Preview AVS FYI Scans Benefits Inquiry Media Manager Change PCP Questionnaires

Flowsheets

Doc Flowsheets

Problem List

History

Letters

Demographics

Growth Chart

Results Review

Medications

Allergies/Rxn

Enter/Edit Resul...

Audiogram

Patient Files

Order Entry

Immunizations

Visit Navigator

Care Assistant

Charting

Care Assistant

BestPractice

Care Assistant

Allergy Script

Allergies/Rxn

Chief Complaint

Vitals

Rev Flowsheet

Nursing Notes

Order Reconciliation

Progress Notes

History

SmartSets

Dx and Orders

Pt. Instructions

LOS

Follow-up

Close Encounter

Immunizations are due: [click here to order](#)

1. [Influenza \(36+ mo\)](#)

Influenza risk: UNSPECIFIED ASTHMA, WITH EXACERBATION, do not give FluMist

Immunization resources

1. [ACIP immunization schedule](#)
2. [VIS in multiple languages](#)



[Office Web](#)
[Billing](#)
[Asthma PFE](#)

- ✔ **Control Tool:** [Filed today \(click to access form\)](#) Asthma Assessment: symptoms are **POORLY CONTROLLED** based on: **asthma symptoms while asleep at night 1 OR 2 TIMES PER WEEK TWO oral steroid courses consider reassessing asthma severity**
- ✔ **Severity:** Mild-Persistent ([problem list noted 07/19/2006](#))
- ⊖ **Tests:** [Spirometry; not on file](#)
- ✔ **Medication:** [On treatment step #3: medium-dose ICS \(click for Asthma SmartSet\)](#)
- ✔ **Care Plan:** [Filed today \(click to access form\)](#)
- ✔ **Education:** [Filed today \(click to access form\)](#)

Asthma topics were reviewed:

Environmental control measures: give furry pet or bird to a family member of friend who does not live in your home; keep pets off furniture, wipe furniture with wet cloth every week; keep pets out of child's bedroom; place dust mite covers on mattress/pillows; remove fabric window coverings, feather or wool bedding; vacuum at least once a week; dust with damp cloth; fix leaks; remove visible mold from home; use air conditioner and dehumidifier if possible; remove indoor plants; don't allow anyone to smoke in the house; don't allow anyone to smoke in the car; keep trash closed; keep food in closed containers; use roach and mice bait.

[Hotkey List](#)

Exit Workspace

? Navigator Hotkeys

Zzzepicare, Bravo 16 year old MRN: 00951343 Allergies/Rxn MDRO PCP INSURANCE My Chart
Male DOB 1/2/1995 Bananas, Strawberry, Polk * (None) (None) Inactive

Snapshot 11/16/2011 visit with Tyra Bryant-Stephens, MD for Office Visit ? Resize

Chart Review Images Admin Asthma CP Open Orders Print AVS Preview AVS FYI Scans Benefits Inquiry Media Manager Change PCP Questionnaires

Allergies: Bananas, Strawberry, Pollen, Amoxicillin, Zyrtec Reviewed on 11/16/2011: Assessed/Confirmed
BMI: , BSA:
BP: P: T: T Src: Resp: W: H:

- Charting
- BestPractice**
- Care Assistant
- Allergy Script
- Allergies/Rxn
- Chief Complaint
- Vitals
- Rev Flowsheet
- Nursing Notes
- Order Reconciliation
- Progress Notes**
- History
- SmartSets**
- Dx and Orders
- Pt. Instructions
- LOS
- Follow-up
- Close Encounter

- Visit Navigator
- Care Assistant
- Hotkey List
- Exit Workspace
- Navigator Hotkeys

Progress Notes (F3 to enlarge)

100% [Clipboard] [Print] [List] [More] [Arial] [11] [B] [I] [U] [S] [A]

[Undo] [Redo] [Find] [Insert] [Bold] [Italic] [Underline] [Strikethrough] [Text Color] [Background Color]

CARDIOVASCULAR: PPP normal S1 and S2, no murmurs, rubs, or gallops

Abbrev	Expansion
M	ASSOCDXORDS Encounter Diagnoses and Associated Orders
S	ASSOCORDS Encounter Diagnoses and Associated Orders
O	ASTALL Common indoor allergens in the patient's home inc...
	ASTAS ASSESSMENT/PLAN: See orders and patient instru...
	ASTFLA The last asthma flare was characterized by {sympt...
A	ASTHMACAREPLAN Asthma Care Plan
B	ASTHMAEDUCATION Education: Persons Taught: {guardian:61} Teachin...
D	ASTHMAINFO Last wheeze: Last use of albuterol: How often uses...
	ASTHMAPLAN Asthma control and teaching summary
	ASTHMA RECOVERY Give ventolin with spacer 4 puffs every four hours fo...
	ASTHMA SYMPTOMS Last wheeze: Yesterday Last use of albuterol: Last...
	ASTHXBR Javoun is a(n) 9 year old male who presents for an ...
	ASTPE PHYSICAL EXAMINATION GENERAL: {general:100...
	ASTPMH IED visits:11331::There were no emergency room v...

ery 4 hours as needed for Wheezing.
es daily. Use with spacer.

Note status: Sign at closing of section Sign at closing of encounter Sensitive

Zzzepicare, Bravo 16 year old MRN: 00951343 Allergies/Rxn MDRQ PCP INSURANCE My Chart
 Male DOB 1/2/1995 Bananas, Strawberry, Poll* (None) (None) Inactive

Snapshot 11/16/2011 visit with Tyra Bryant-Stephens, MD for Office Visit

Images Admin Asthma CP Open Orders Print AVS Preview AVS FYI Scans Benefits Inquiry Media Manager Change PCP Questionnaires

Allergies: Bananas, Strawberry, Pollen, Amoxicillin, Zyrtec Reviewed on 11/16/2011: Assessed/Confirmed
 BMI: , BSA:
 BP: P: T: T Src: Resp: W: H:

Progress Notes (F3 to enlarge)

100% [Clipboard] [Print] [More] Arial 11 B I U S A

•asthma symptoms while asleep at night 1 OR 2 TIMES PER WEEK•TWO oral steroid courses

Asthma topics were reviewed:
Environmental control measures

- give furry pet or bird to a family member of friend who does not live in your home
- keep pets off furniture, wipe furniture with wet cloth every week
- keep pets out of child's bedroom
- place dust mite covers on mattress/pillows
- remove fabric window coverings, feather or wool bedding
- vacuum at least once a week
- dust with damp cloth
- fix leaks
- remove visible mold from home
- use air conditioner and dehumidifier if possible
- remove indoor plants
- don't allow anyone to smoke in the house
- don't allow anyone to smoke in the car
- keep trash closed

Note status: Sign at closing of section Sign at closing of encounter
 Sensitive

- Charting
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- Allergy Script
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- Dx and Orders
- Pt. Instructions
- LOS
- Follow-up
- Close Encounter

Finishing Documenting Teaching

In NURSING NOTE, type in .asthmaeducation and a drop down menu will appear. Simply put in the Education Topic covered and use F2 to fill in the rest of the drop downs!

Education:

Persons Taught: {guardian:61}

Teaching Method: {VERBALWRITTEN:13324}

Patient-Parent Readiness to Learning: {readiness to learn:13325}

Patient-Parent Barriers to Learning: {barriers:11035::"none"}

Patient-Parent Outcome: {outcome:13326}

Dot-asthmaeducation

|

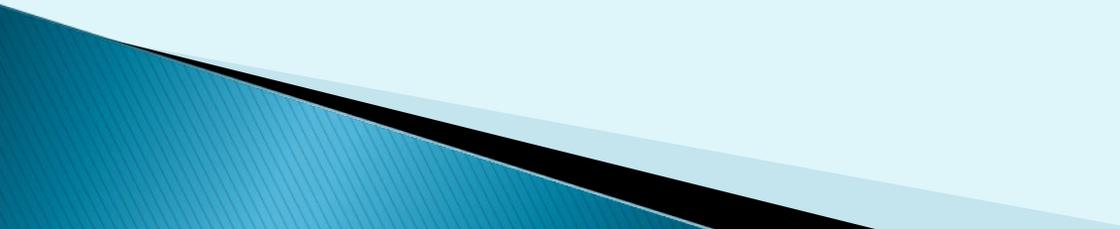
Ten commandments for effective clinical decision support

- Speed is everything ✓
- Anticipate needs and deliver in real time ✓
- Fit into the user's workflow ✓
- Little things can make a big difference ✓
- Recognize that physicians will strongly resist stopping
- Changing directions is easier than stopping
- Simple Interventions work best ✓
- Ask for additional information only when you really need it
- Monitor impact, get feedback and respond ✓
- Manage and Maintain your knowledge-based systems ✓

Results



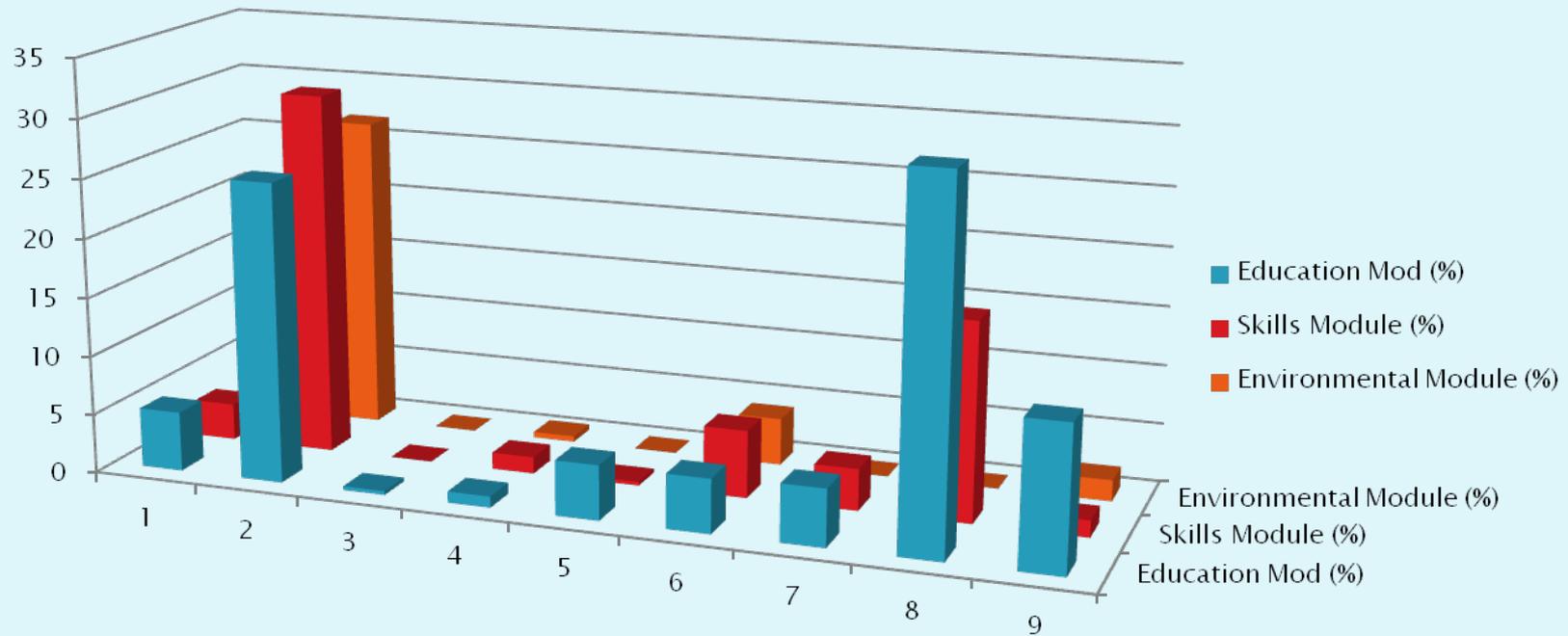
Baseline Results

- ▶ 50 providers received asthma environmental education in four sites
 - ▶ 40 residents received asthma environmental education in four sites
 - ▶ 120 caregivers enrolled
- 

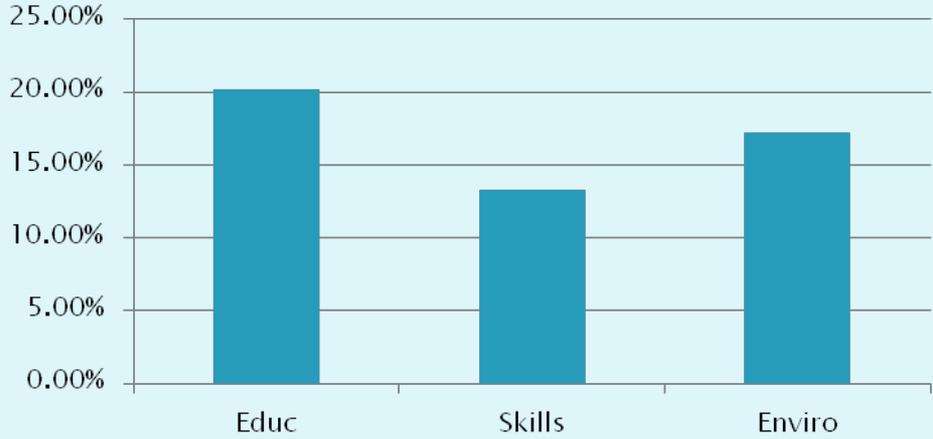
% Providers Utilizing Education Modules during Clinic Visits with Patients



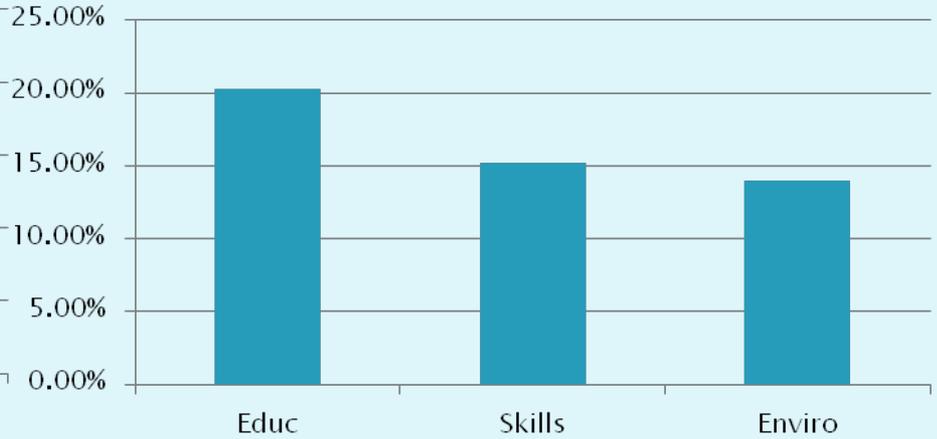
Baseline Intervention Provider Use



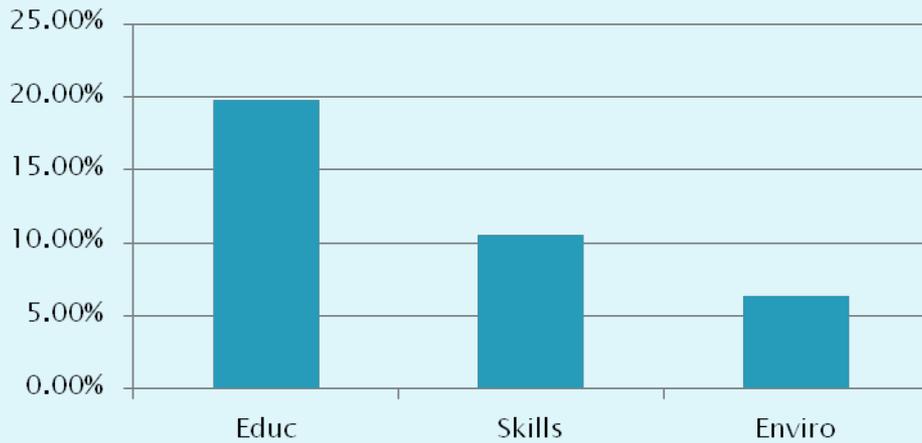
Site 1



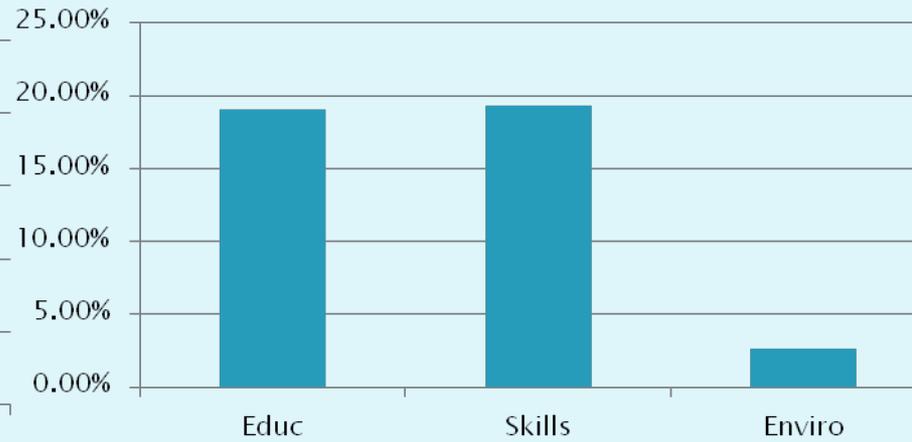
Site 3



Site 2



Site 4

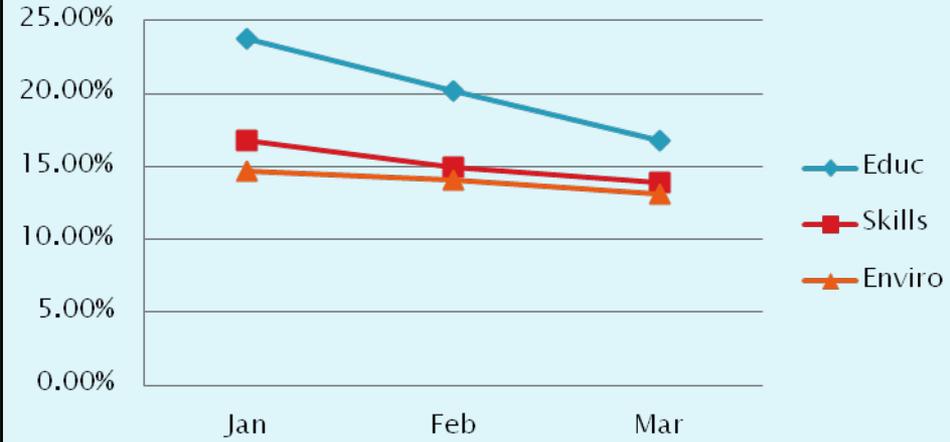


Intervention Sites Average use of modules at 6 months

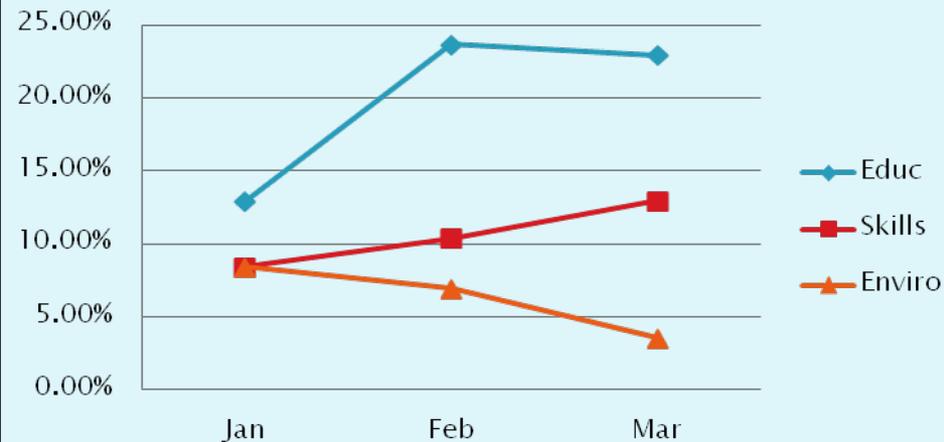
Site 1



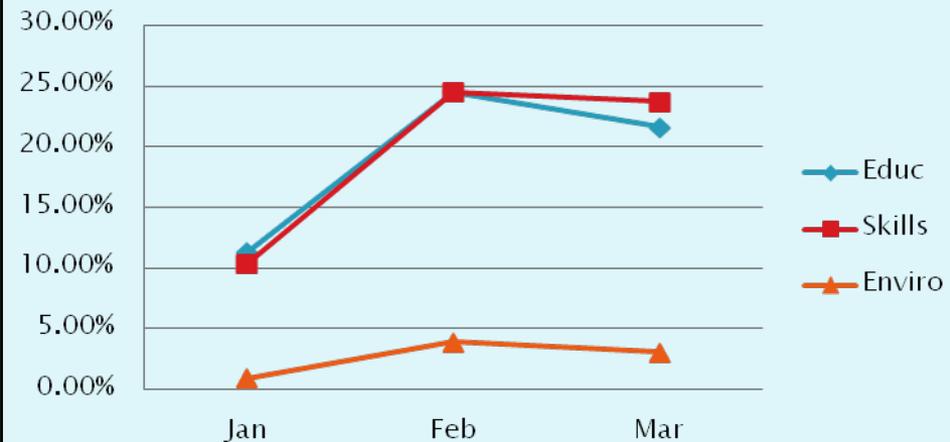
Site 3



Site 2

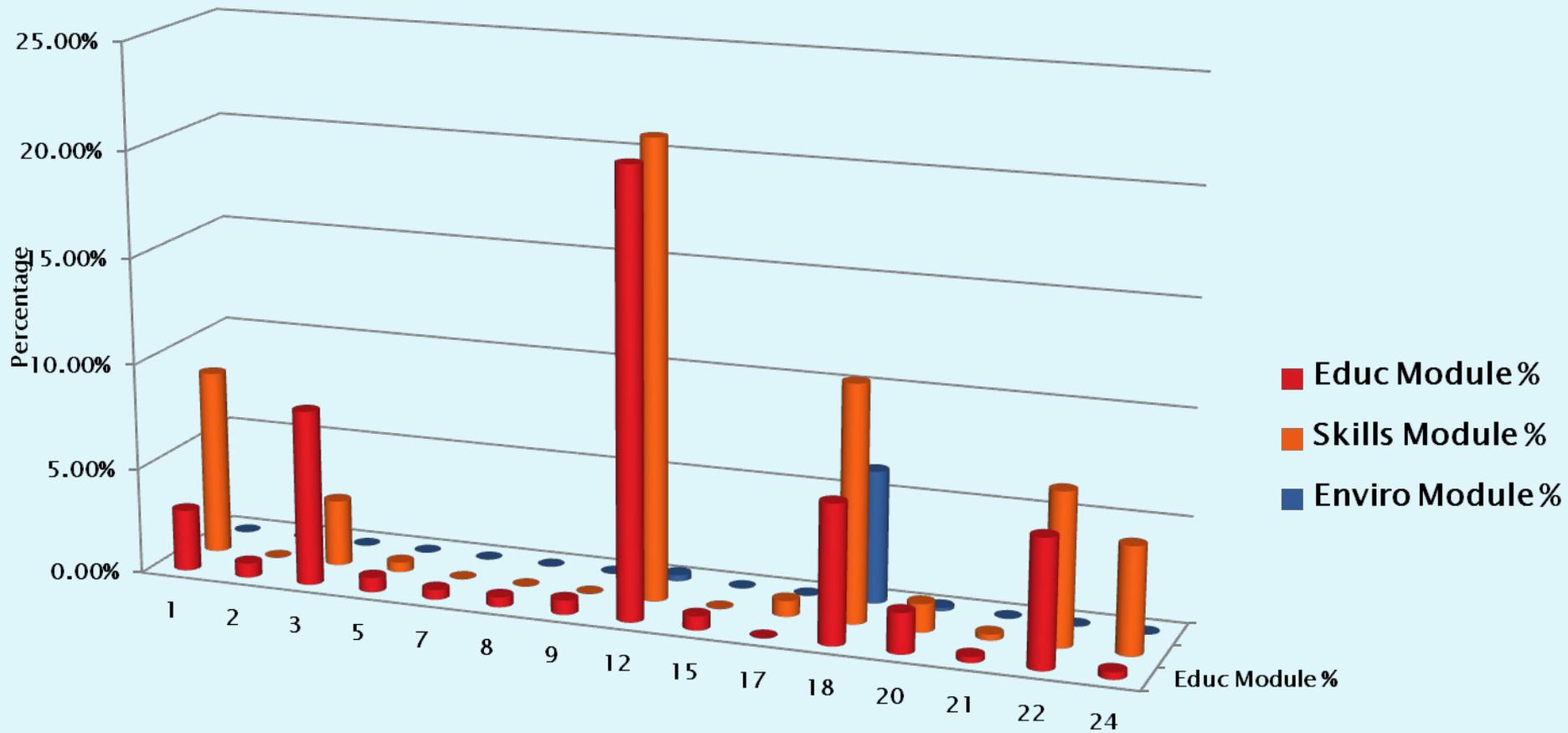


Site 4

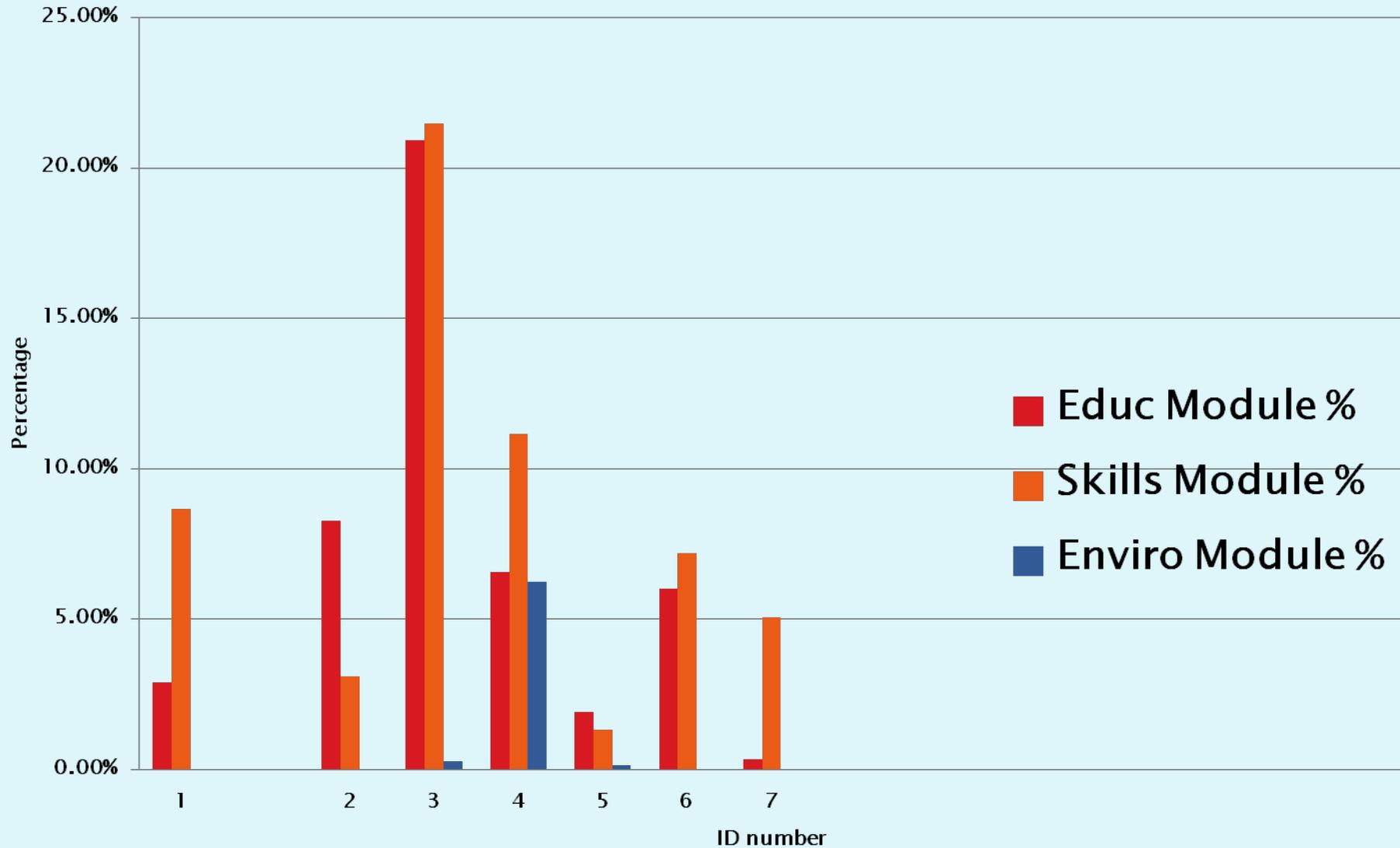


Intervention Sites use of Modules over 3 months

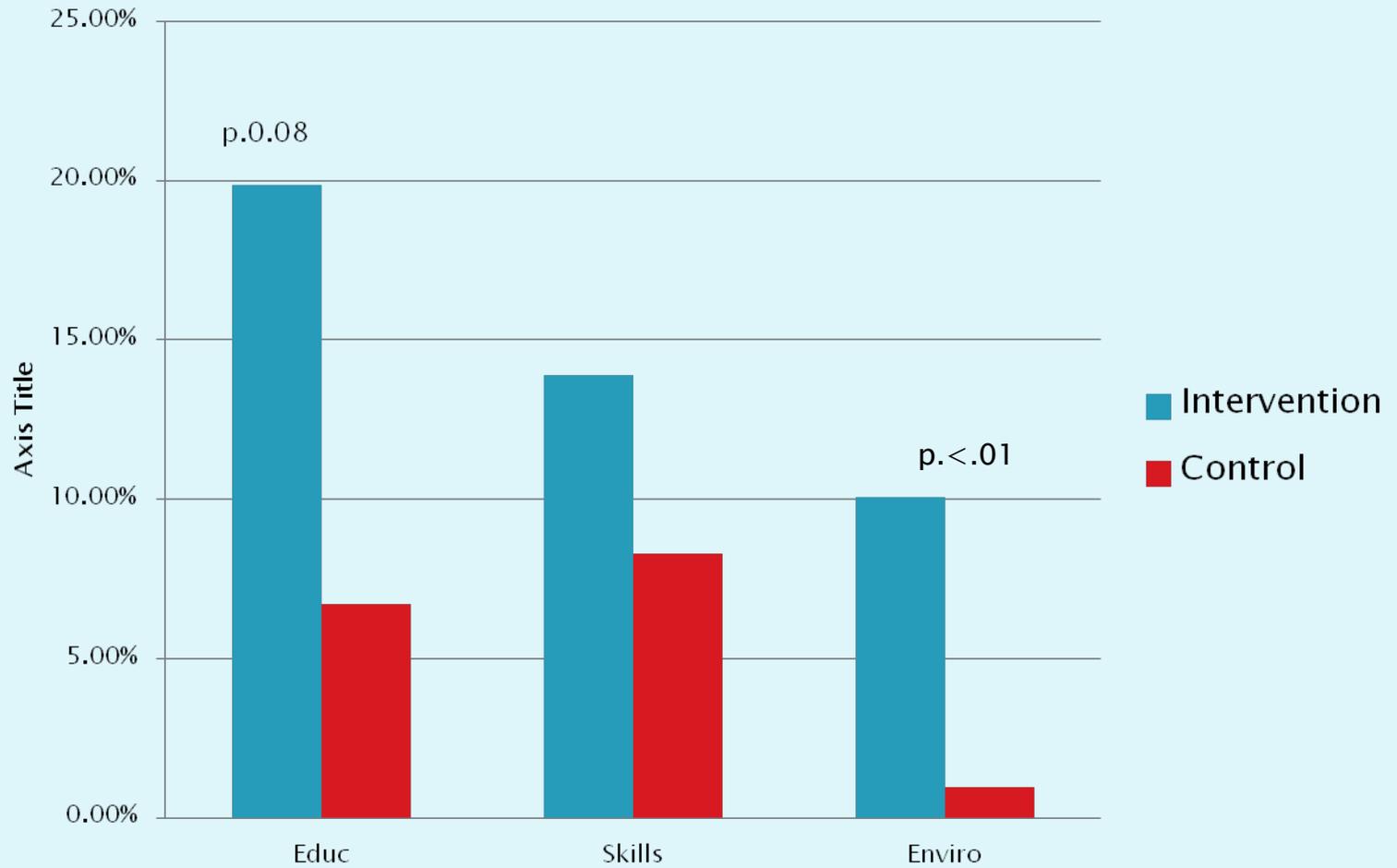
Control Sites – Average Utilization of Education Modules



Control Sites with Most Frequent Utilization



Intervention vs Control Utilization of Asthma Education Modules



Next Steps

- ▶ Monthly feedback written data supplied to group practices regarding individual provider use of environmental module through physician asthma champions
- ▶ Based on feedback from pcp– Education module will be programmed to automatically populate note
- ▶ Asthma champions demonstrate use for practice
- ▶ Nursing staff attended webinar training and now being taught to use education module in practice
- ▶ Implementing CEASE program to promote smoking cessation counseling in the office
- ▶ Evaluating whether AEE in office promotes changes in caregiver behavior

Summary

- ▶ PCP Asthma Environmental Education + EHR Clinical Decision Support promotes asthma environmental education more than CDSS alone
- ▶ Any change in pcp office education requires frequent booster sessions
- ▶ There are early and late adopters in all practices
- ▶ Feedback to practices must be ongoing

Acknowledgements

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- ▶ Lucia Patullo, CAPP Research Assistant
- ▶ Charmane Braxton, CAPP Community Health Worker
- ▶ Carmen Perez, CAPP Community Health Worker

Questions??

Children's Health & The Environment



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Environment

MACCHE

www.childrensnational.org/MACCHE/

Introduction to PEHSUs



<http://www.aoec.org/pehsu.htm>

<http://www.pehsu.net>



Environmental Health: Definition

Pew Environmental Health Commission

Environmental health comprises those aspects of human health, including quality of life, that are determined by interactions with physical, chemical, biological and social factors in the environment. It also refers to the theory and practice of assessing, correcting, controlling, and preventing those factors in the environment that may adversely affect the health of present and future generations.

<http://pewenvirohealth.jhsph.edu/html/home/home.html>

Environmental Health: Challenge

Pediatric Environmental Health is complex...

- **We live in a polluted world**
- **Children are vulnerable to their environment**
- **Sadly, we don't yet understand the impact of most chemicals in the environment on children**

Our Polluted World

Chemical Abstracts Service:

<http://www.cas.org/cgi-bin/cas/regreport.pl>

- > 62 million chemicals
- ~ 48 million are commercially available
- ~ 280,000 (<1%) “regulated”

Ingestion and inhalation of
“poisons” is a daily occurrence!



Our Polluted World

We see stories in the news every day...

philly.com 66° May 11, 7:04 AM | Traffic Clear

Home News Sports Entertainment Business Restaurants & Food Living South Jersey Weather Nation World Lottery Politics Religion Weird News Blogs Edit



Opinion

EMAIL PRINT FONT SIZE 12 COMMENTS

Posted on Tue, May, 10, 2011

Strong evidence that shale drilling is risky

Water pollution should give gas enthusiasts pause.

By Rob Jackson and Avner Vengosh



"Would you drink the water?" Somebody asked us that question after hearing about our team's study showing high levels of methane in well

Greenspace

ENVIRONMENTAL NEWS FROM CALIFORNIA AND BEYOND

< Previous | Greenspace Home | Next >

Study finds a link between plastics chemical BPA and childhood asthma

February 4, 2010 | 2:02 pm

(1) (26) Comments (2)



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HealthCheck

Docs find lead in ceramics from Philly's Chinatown

Tuesday, March 01, 2011



00:00 / 00:00 SHARE

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At the Orange County Sanitation District, a settling basin is used to filter water as part of the advanced secondary treatment, before the water is diverted into the ocean, in Fountain Valley, Calif. Pharmaceuticals in waterways are damaging wildlife across the nation and around the globe, research shows.

By Ric Francis, AP

AP: Drugs found in drinking water

Updated 9/12/2009 2:02 PM | Comments 161 | Recommend 92

By Jeff Donn, Martha Mendoza and Justin Pritchard, Associated Press



A vast array of pharmaceuticals — including antibiotics, anti-convulsants, mood stabilizers and sex hormones — have been found in the drinking water supplies of at least 41 million Americans, an Associated Press investigation shows.

To be sure, the concentrations of these pharmaceuticals are tiny, measured in

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Increased Childhood Susceptibility

Increased Vulnerability to Env. Influences

Preconception→Fetus→Childhood

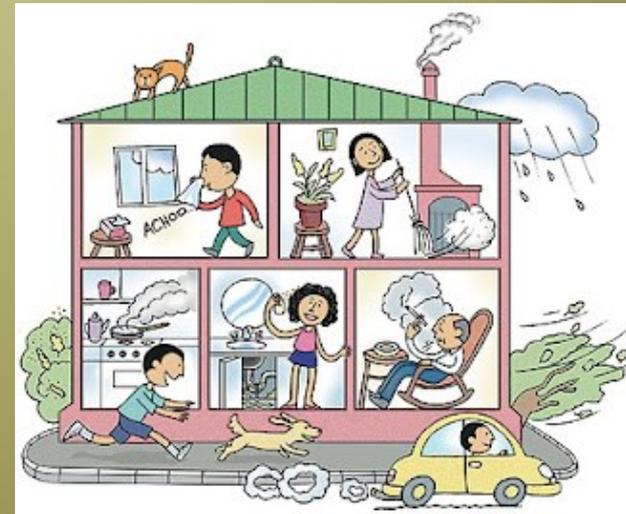
- Exposure pathways
- Cellular differentiation
- Metabolic rate
- Neuronal development
- Endocrine maturation
- Lung development
- Etc.

Asthma and the Environment

The focus of Dr. Bryant-Stephens' presentation.

Asthma is a leading cause of illness and death in childhood.

There are a number of environmental influences.



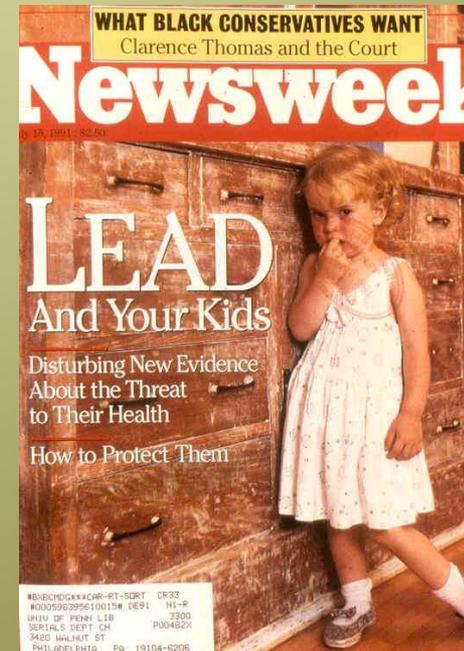
Environmental Health

**Environmental influences on health go
beyond asthma...**

Environmental Health

Environmental influences on health go beyond asthma...

The environment can affect brain development.



Environmental Health

Environmental influences on health go beyond asthma...

“Endocrine disrupting” chemicals can affect hormonal development

- Increasing rates of hypospadias**
- Early sexual maturation**
- Etc**

Environmental Health

Environmental influences on health go beyond asthma...

Environmental chemicals termed “obesogens” have been associated with childhood obesity.



The screenshot shows a webpage from 'THE DR. OZ SHOW'. At the top right, there is a banner for 'everybody's moving to metro' with a Samsung Freeform III phone. Below the banner is a navigation menu with links for Home, Videos & More, Ask Oz, Episodes, and Recipes. A secondary menu lists 'HOT TOPICS' such as 'Drink Away Bloat', 'Trim Fat in 10 Days', and 'All Topics'. The main content area features a 'Back to Videos & More' link and 'Print | Favorite' options. The article title is 'Understanding Obesogens'. The text below the title reads: 'There's a new group of secret saboteurs in the war against weight gain. They're called obesogens, and they are all around us. Here's how to track down the enemies to win the battle of the bulge.' Below the text is an image of three silver water bottles and a 'Pin it' button.

Pediatric Environmental Health

Conundrum: **So Many Environmental Exposures**
 So Many Health Effects

**Environmental health may be underrepresented in
medical school curricula.**

**When confronted with an environmental health
issue regarding a child, where does one
turn?**

PEHSU

What is a PEHSU?

- A resource for health care providers, public health officials, school personnel, parents and others to get questions answered about children's health and the environment.
- A collaboration between an AOEC clinic and an academic pediatric program.

PEHSU History

1996 – ATSDR Child Health Initiative

Emphasis on environmental hazards.

1998 – PEHSU programs in Seattle and Boston

Current – Expansion to national coverage via EPA region

PEHSU Regions



Exposures Relevant to PEHSUs

Lead

Arsenic

Mercury

Air Pollutants

Water Pollutants

Carbon Monoxide

Pesticides

Volatile Organic Compounds
“Sick Buildings”

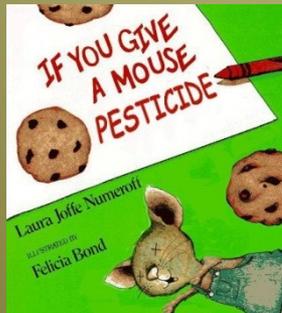
Hazardous Waste Sites

Agricultural Pollutants

Solvents

Work Sites

“Built Environments”



What Does Your PEHSU Do?

Consultation

For clinicians regarding children's env health

Education / Outreach

Public, professional, and train-the-trainer

Referral

To appropriate resources within the community.

Advisory

Information to help shape public policy.

PEHSU Funding



The Association of Occupational and Environmental Clinics is responsible for programmatic and financial management.



PEHSU Disclaimer

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- The U.S. Environmental Protection Agency (EPA) supports the PEHSU by providing funds to ATSDR under Inter-Agency Agreement # DW-75-923301301-0. Neither EPA nor ATSDR endorse the purchase of any commercial products or services mentioned in PEHSU publications.



Academic Disclaimer

Dr. O is employed at The Children's Hospital of Philadelphia where he directs the poison control center, and is a member of the faculty of the Perelman School of Medicine of The University of Pennsylvania

- **The Poison Control Center is partially supported by a Poison Control Center Support and Enhancement grant from the U.S. Health Resources and Services Administration (HRSA).**
- **This presentation is the sole work of Dr. Osterhoudt and has not been vetted nor endorsed by The Children's Hospital of Philadelphia, the University of Pennsylvania, or by the HRSA.**
- **Dr. O has no commercial conflicts of interest related to this presentation.**

