ASTHMA HOME VISITS: THE NEED, THE VALUE, & TIME FOR FEE-FOR-SERVICE

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SCHOOL OF MEDICINE

CASE WESTERN RESERVE UNIVERSITY

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Hospitalization for Asthma is a Failure of Medical Care

MAJOR DIFFICULTIES:

- **COMPLIANCE (EDUCATION/CASE MANAGEMENT)**
- **ENVIRONMENTAL TRIGGERS (HOME)**

HOW LARGE IS THE PROBLEM?

	Asthma	
	Lifetime	Current
NATIONALLY (CDC, 2012)		
Children	13.6%	9.4%
Med expenses =$50.1 billion/yr; 479,300 hospitalizations/yr		
CUYAHOGA COUNTY (mid sch, YRBS, 2010)		
White	18.1%	9.9%
Black	24.5%	14.7%
Hispanic	28.0%	16.0%
City of CLEVELAND (high sch, YRBS, 2009)		
White	24.0%	16.7%
Black	24.6%	13.7%
Hispanic	31.1%	15.0%

ASTHMA HOSPITALIZATIONS

Rainbow Babies & Children's Hospital

	2011	3 years
Asthma hosp (0-19yr):		
Primary admit Dx	516	1512
Dx asthma included	1642	
Hosp including PICU	32.6%	
Re-admits within 30 d		3.44%
Ave length of stay	2.7 d	2.65 d

MetroHealth Medical Center

Asthma hosp (0-19yr):		550

ASTHMA HOSPITALIZATIONS
Rainbow Babies & Children's Hospital

PAYERS	2011
Asthma hosp (0-19yr):	
COMMERCIAL	6.4 % (33)
MANAGED CARE	12.8 % (66)
MEDICAID	78.7 % (406)
SELF PAY	2.1 % (11)

MEDICATION APPROACH

- Controller medications (e.g. aerosolized steroids)
- Rescue medications (e.g. albuterol)
- XOLAIR (omalizumab)
  - **Subcutaneous injection every 2-4 weeks**
  - **Costs (RB&C Asthma Center experience):**
    - **Transportation/parking for clinic (family burden)**
    - **25% effort for a nurse**
    - **$1500-$2200 /injection → $19,000 - $57,600 /year (Medicaid allowed charges; 72% high end)**

ENVIRONMENTAL APPROACH

NIH Expert Panel Report 3: Guidelines for the Diagnosis and Management of Asthma 2007

- For asthma management, essential to control relevant inhalant allergens and irritants—especially in the home
- Reducing exposure can reduce inflammation, symptoms, need for medication
- Multifaceted, in-home interventions effective; single steps generally not
- Determine inhalant sensitivity

http://www.nhlbi.nih.gov/guidelines/asthma/

RECOMMENDATIONS FOR ASTHMA HOME VISIT PROGRAMS

- National Asthma Education and Prevention Program (**NAEPP**) Expert Panel Report, "Guidelines for the Diagnosis and Management of Asthma" (**NHLBI**, 2007)
- Asthma Health Outcomes Project (AHOP) (**EPA, 2008**)
- Task Force on Community Prevention Services (the **Task Force: CDC, 2008**)
- The Global Initiative for Asthma (**GINA, 2010**)

HOME ENVIRONMENT APPROACH

- Smoke-free home policies for indoor areas;
- Multifaceted, tailored interventions for reducing asthma morbidity;
- Integrated pest management (IPM) to reduce cockroach allergen; and
- Combined elimination of moisture intrusion and leaks and removal of moldy items to reduce mold and respiratory symptoms.

Kreiger et al, J Public Hlth Management & Practice, 2010, 16(5 Suppl):S11-20.

CASE HEALTHY HOMES AND PATIENTS PROGRAM (CHHAP)

BASIC ASTHMA PROGRAM (RB&C Asthma Center):

1. Pediatric Pulmonary physician refers their patient for a home visit; a Home Health Inspector from Environmental Health Watch (often accompanied by a pulmonary fellow) goes to the patient's family's home for inspection/intervention.
2. Action Plan is devised
   - Pulmonary Fellow: Behavior education (HUD booklet)
   - HH Inspector: Home health & safety items provided, Home interventions provided / referred
3. Pulmonary Fellow tracks patient's health events

CHHAP- Three Year Outcomes

ASTHMATIC CHILDREN-

- Clinical Outcomes- Project patients (n = 27):
  - Compared hospitalizations for the year prior to home visit to the year after the visit

Previous Year:		#	annual rate	
	Hosp	50	1.85	
	PICU	19	0.38	
	30 d Re-Admit	6	0.12	
Year after home visit:				% decrease
	Hosp	21	0.78	58%
	PICU	7	0.33	63%
	30 d Re-Admit	0	0.0	100%

OPTIMAL HOME VISIT PROGRAM

- **TARGET ASTHMA POPULATION**
  - **Hospitalized**
  - **Prescribed Xolair**
- **PHYSICIAN REFERRAL**
  - **Written medical care plan**
  - **Allergen prick testing**
- **HOME VISIT STRUCTURE**
  - **Environmental triggers**
  - **Hands-on trigger education of family**
  - **Cont'd care plan education**
- **VISIT REPORT to Referring Physician**
- **SERVICE PROVIDERS (certified)**
  - **Supported by fee system**

EHW asthma home visit costs

- Trigger control equipment, materials & contractors:
  - Equipment & materials: $300-$550
  - Contractor work (IPM &/or cleaning): $150-$1,000
  - Combined: $300-$1550.
- Staffing costs (2-4 visits): $400-$800.
- Total costs: $700-$2,350.

HUD PILOT SUMMIT SUMMARY

- Three expert panels (NIH,EPA,CDC) plus GINA recommend inclusion of home environment in medical management of asthma.
- Asthma home visit should be closely tied to clinical care team and medical care plan.
- Asthma home visits should be dual purpose: home environment and case management.
- Cost-effectiveness more likely attained by targeting previously hospitalized patients
- Grant funding is insufficient to cover the need

Cost-Effectiveness

STUDY	PROGRAM COSTS[1]	MEDICAL COST SAVINGS[1]	BENEFIT/COST
Minnesota (Oatman,2007)[2]	$497	$2,637	5.3
Seattle (Krieger, 2005)[2]	$1316	$124-147	0.09-0.11
ICAS (Kattan, 2005)[2]	$1720	$555	0.32
Boston (Woods, 2012)[3]	$2529	$3827	1.4
Baltimore[4] (2012)+	$1386	$2217	1.6

1 Average values per participant per year
2 from, Nurmagambetov et al., Am J Prev Med 2011, 41:S33-S47
3 Woods, et al., Pediatrics 2012, 129:465
4 K Scott, P McLaine, M Shea, Baltimore City Health Department, kate.scott@bmsi.org

Health Impact Bonds: Fresno, CA pilot program

- 200 asthmatic children selected based on expense profiles with Medi/Cal
- HI Bond will pay for in-home inspections/interventions
  - Community health workers; environment & case management; monthly calls, quarterly home visits
- Project 30% reduction in ED, 50% decrease in hospitalizations --> net savings $5,000 per pt/yr
- Investors receive a portion of the savings

http://ehp.niehs.nih.gov/2013/02/121-a45/

ASTHMA HOME VISITS
Current Strategy

GOAL

- Fee-for-service funding for home visits

PROCESS

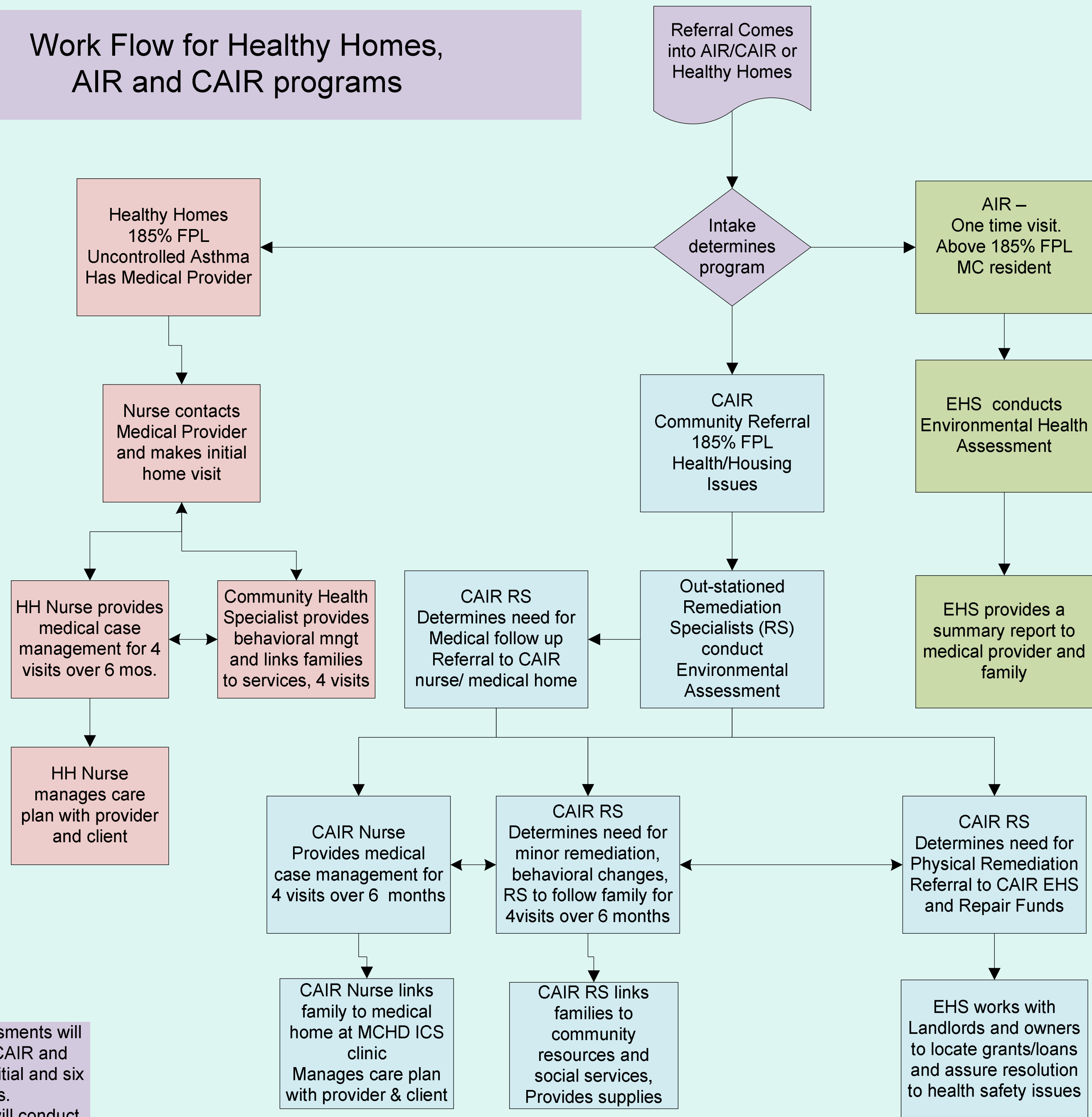
- Brought together Ohio Healthy Homes grantees to address complexities and uniformity→ consensus
- Obtain Ohio Medicaid endorsement/facilitation (not asking for funding)
- Educate and enlist medical insurers- MMCO's
- Institute pilot program in Cuyahoga County

Multnomah County Healthy Homes and Families Programs Investing in Best Practices

Kim Tierney, Program Supervisor, Healthy Homes and Families
Multnomah County Environmental Health,
Portland, Oregon

Healthy Homes and Families Programs

- ***2005 HUD Demonstration Grant - Healthy Homes Asthma Program*** - 6 month nursing case management program serving low income children with Asthma
- ***2009 Asthma Inspection and Referral Program (AIR)*** 2009 – One time visit by EHS with report to families and referring providers – General Fund
- ***2009 Housing Code/ Rental Inspections-General*** Fund
- ***2010 HUD Healthy Homes Demo Grant – CAIR*** – serving children with asthma and other environmentally caused health conditions
- ***Lead Poisoning Prevention Program*** – City/State Grants

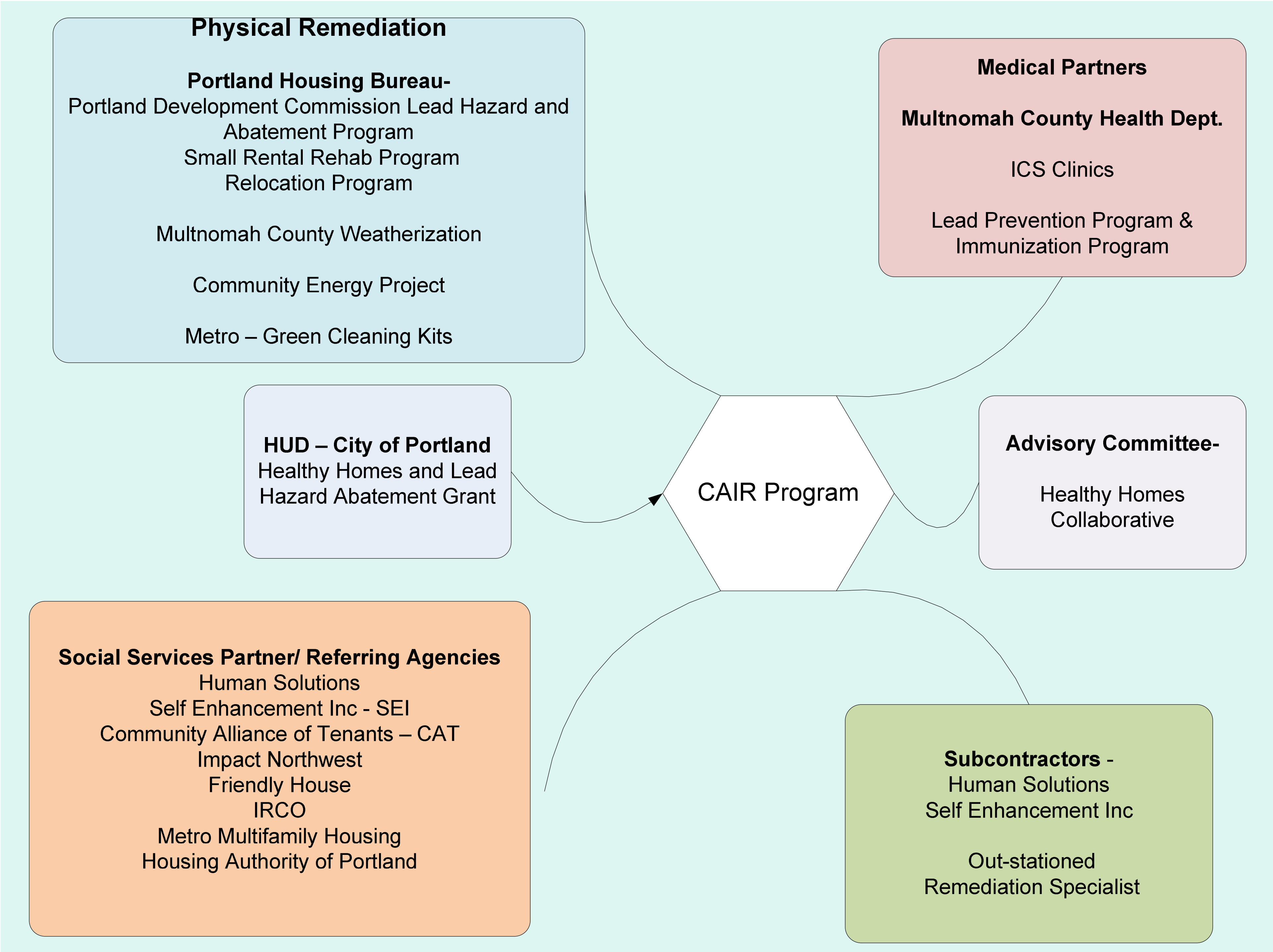

Work Flow for Healthy Homes, AIR and CAIR programs
Referral Comes into AIR/CAIR or Healthy Homes
Intake determines program
Healthy Homes 185% FPL Uncontrolled Asthma Has Medical Provider
AIR – One time visit. Above 185% FPL MC resident
Nurse contacts Medical Provider and makes initial home visit
CAIR Community Referral 185% FPL Health/Housing Issues
EHS conducts Environmental Health Assessment
HH Nurse provides medical case management for 4 visits over 6 mos.
Community Health Specialist provides behavioral mngt and links families to services, 4 visits
CAIR RS Determines need for Medical follow up Referral to CAIR nurse/ medical home
Out-stationed Remediation Specialists (RS) conduct Environmental Assessment
EHS provides a summary report to medical provider and family
HH Nurse manages care plan with provider and client
CAIR Nurse Provides medical case management for 4 visits over 6 months
CAIR RS Determines need for minor remediation, behavioral changes, RS to follow family for 4visits over 6 months
CAIR RS Determines need for Physical Remediation Referral to CAIR EHS and Repair Funds
CAIR Nurse links family to medical home at MCHD ICS clinic Manages care plan with provider & client
CAIR RS links families to community resources and social services, Provides supplies
EHS works with Landlords and owners to locate grants/loans and assure resolution to health safety issues
Pre and Post Assessments will be conducted for CAIR and Healthy Homes at initial and six month visits. Medical programs will conduct additional evaluations.

CAIR Program

- The CAIR Program is a three year HUD funded Healthy Homes Demonstration program designed to assist low income families with children experiencing health issues related to living in substandard housing conditions.

How is CAIR Unique?

- Out-stationed Staff at Community Agencies
- Web based referral and data system
- Partners to provide home repair
- Partners to provide medical homes
- Broader health issues than just asthma
- Team case management through web
- Expanded interventions – Air Quality, Safety, Hazards


Physical Remediation
Portland Housing Bureau-
Portland Development Commission Lead Hazard and Abatement Program
Small Rental Rehab Program
Relocation Program
Multnomah County Weatherization
Community Energy Project
Metro – Green Cleaning Kits
Medical Partners
Multnomah County Health Dept.
ICS Clinics
Lead Prevention Program & Immunization Program
HUD – City of Portland
Healthy Homes and Lead Hazard Abatement Grant
CAIR Program
Advisory Committee-
Healthy Homes Collaborative
Social Services Partner/ Referring Agencies
Human Solutions
Self Enhancement Inc - SEI
Community Alliance of Tenants – CAT
Impact Northwest
Friendly House
IRCO
Metro Multifamily Housing
Housing Authority of Portland
Subcontractors -
Human Solutions
Self Enhancement Inc
Out-stationed Remediation Specialist

Create Sustainable Funding for Healthy Homes Interventions

Goal: Amend the State Health Plan to provide Targeted Case Management reimbursement for Healthy Homes and opportunities for other Health Departments to provide this service

Phase I

- Educate yourself on “policy making basics”
- Research legislators and key issues
- Connect with your Government Relations Liaison
- Identify organizations that can be allies
- Engage Public Health colleagues
- Schedule meetings and listen, listen, listen

Phase II

- Set a clear policy goal
- Revise key points
- Directly advocate and educate
- Engage the media
- Tell the facts and personal testimony of success
- Carefully plan and hope for good luck

"New Program Highlights Household Asthma Triggers"

PORTLAND, OR 2006-08-10 The Multnomah County Health Department has started a new program to raise awareness about asthma and to help struggling families.

Asthma is becoming increasingly common in the U.S. It's a disease that leaves people wheezing and panting for breath. Those who live in cities are at higher risk, but asthma is growing even faster among minority populations, who often live in older homes and closer to large industrial areas.

Maribel Correa, who moved to the U.S. from Colombia 7 years ago, lives in Northeast Portland with her husband and four kids. Her two youngest have had problems with asthma. Last spring one got sick with a cold.

"It started to fill up his throat and she went to the hospital and they said he had bronchitis, and it had never happened before and she got scared," translates Correa's 11-year-old daughter, Melissa. "They gave her some medicine to give to the kids and in three days it got worse and so she took him to the hospital." Correa says eventually they found out it wasn't bronchitis - it was asthma. Doctors told her that her son's respiration was half the level it should be.

Media Engagement

Getting your message out to decision makers and the public.

My name is Wilma Ramirez I Am 15yrs
old, I live in SE. portland with my
mom and my six sisters. My family means
everything to me! Four of my sisters
have asthma. It is hard for me when
I see one of my sisters struggleing to
catch their breath when they are in an
enviornment where it is not clean.
The healthy home program is a program
that has helped us get out of an
enviornment like that. This program has
done so much for my family and me.
Throughout this program it has helped
us understand the medicines that can
help my sisters with the asthma and
also the proper way to use chemicals
around the house. The kind of chemicals
that are less dangerous. Also the underst
of indoor air quality. The last time I reme
being in the emergency room because of
one of my sisters was about 5yrs ago. It
all started when we were on our way to
the clinic for an appointment to my self.
When we arrived I realized my younger
sister had come down with a fever.
I remember I carried her into the clinic
because she had no strength to hold her
self up. When we were in they check me

Public Engagement

Building awareness and support

Investing in Best Practice for Asthma:

A Business Case for Education and Environmental Interventions

Original material written by Polly Hoppin and Molly Jacobs, University of Massachusetts Lowell and Laurie Stillman, Asthma Regional Council of New England. Additions from the Multnomah County Environmental Health Services Healthy Homes Program, Portland, Oregon.

Direct Advocacy

Educating and influencing decision makers on public policy.

Key steps to final policy goal

- Convene the Directors of Managed Care Plans,
- Politicians
- Communicate Return on Investment
- Identify a champion within DMAP to help carry our work forward
- Research national efforts
- Adapt core functions to Healthy Homes
- Identify key steps to implementing a TCM

Key steps to final policy goal

- Develop a plan and timeline and coordinate monthly meetings with DMAP staff.
- Submit a State Plan Amendment (SPA) waiver to Center for Medicaid Services
- Implement immediate time study
- Analyze policy to determine billable activities
- Negotiate rate with DMAP
- Begin TCM!

TCM Implementation

- Develop TCM Chart Forms/Standards
- Develop Billing System
- Develop Workflow
- Quarterly Time Studies
- Evaluate Program
- Audit Charting
- Revise Productivity down
- Revise Costs upward

TCM Healthy Home - Risk Criteria

Target group: Medicaid eligible children with poorly controlled asthma or a history of environmentally induced respiratory distress which can result in a life threatening asthma exacerbation or exacerbation of respiratory distress.

Risk factors could include, **but are not limited to**:

- (a) Unscheduled visits for emergency or urgent care;
- (b) One or more in-patient stays;
- (c) History of intubation or Intensive Care Unit care;
- (d) A medication ratio of less than or equal to .33;
- (e) Environmental or psychosocial concerns raised by medical home;

TCM Healthy Home – Description of services

Comprehensive assessment of individual needs:

- Taking client history;
- Evaluation of the extent and nature of recipient's needs (medical, social, educational, housing, environmental, including assessment for risk of lead exposure and existence of second hand smoke and other specified asthma triggers and irritants, and other services) and completing related documentation;
- Gathering information from other sources to complete assessment

Development of specific care plan

Monitoring and follow-up activities

Linking/Referral, etc

Reassessment

TCM Healthy Home – Provider Requirements

The case manager must be a licensed Registered Nurse, registered Environmental Health Specialist, Asthma Educator certified by the National Asthma Education and Prevention Program, Community Health Worker certified in the Stanford Chronic Disease Self-Management Program, or worker working under the supervision of a licensed Registered Nurse or a registered Environmental Health Specialist.

Demonstrate Return on Investment
Collect Data

- Emergency Room Visits
- Hospitalization
- Medication Ratio
- Change in Environmental Scores
- ACT or TRACK Scores
- Quality of Life questions
- Work or School Days lost

Lessons Learned

Resources for Home Repair CDBG

Medical Homes

Community Partners

Program Income

Underestimating the need

Out-stationed Staff

Difference between CAIR / Healthy Homes

Challenges

- New Technology
- Data Base development
- Enrollment
- Partner timelines
- Community Health Worker scope
- Charting
- Caseload Management
- Landlord Tenant Issues

ER Visits (Closed Cases)

- Healthy Homes – Asthma
- 61 clients total
- 56% No Change
- 5 % Increased
- 39% Decreased
- 2.5 visits saved in 6 months
- 5 visits saved per client/ per year X cost of ER visit
- 122 visits saved over 2 yrs

- CAIR –Asthma and other conditions
- 149 clients total
- 70% No Change
- 7 % Increased
- 22 % Decreased
- 2 visits saved in 6 months
- 4 visits saved per client/ per year X cost of ER visit
- 132 visits saved over 2 yrs

ACT Score Changes

Healthy Homes

- 83% of Cases showed an increase in ACT score
- Average ACT score change was 6.1 for all clients.
- Average ACT score change was 7.8 for all clients whose ACT score improved

CAIR

- 71% of Cases showed an increase in ACT score
- Average ACT score change was 3.7 for all clients.
- Average ACT score change was 6 for all clients whose ACT score improved

Qualitative Questions

	CAIR	HH		OR (CAIR)	CI
1. How would you rate the health of your family	100%	132%		2.3	[0.9-6.1]
2. Housing as the source of illness	-93%	-85%		**13.8**	[2.9-64.5]
3. Emergency room visits for household in the last 6 months (self reported)	-59%	-29%		2.1	[0.8-5.0]
4. Average number of visits in last 6 months	-2.5	-1.9		1.79	[0.7-4.1]
5. Household members had access to health care	61%	0%		**7.5**	[3.5-16.4]
6. Comfort with Landlord	-56%	-29%		**2.7**	[1.1-6.1]

OR is from logistic regression model predicting final scores from program type, controlling for pre scores.

Percents are relative changes from baseline.

In all cases, CAIR has superior results, with Questions 2, 4, and 5 being statistically significant

Questions and feedback:

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http://web.multco.us/health/healthy-housing

Healthy Homes In Seattle/King County

June Robinson, MPH

June 5, 2013

Healthy Homes I

Funding source: NIEHS

Healthy Homes I

- In-home environmental assessment and education by community health workers
- Comparison of single visit model to more intensive multi-visit model
- RCT of 274 low-income households with children with asthma
- Published in American Journal of Public Health, April 2005

Community Health Workers

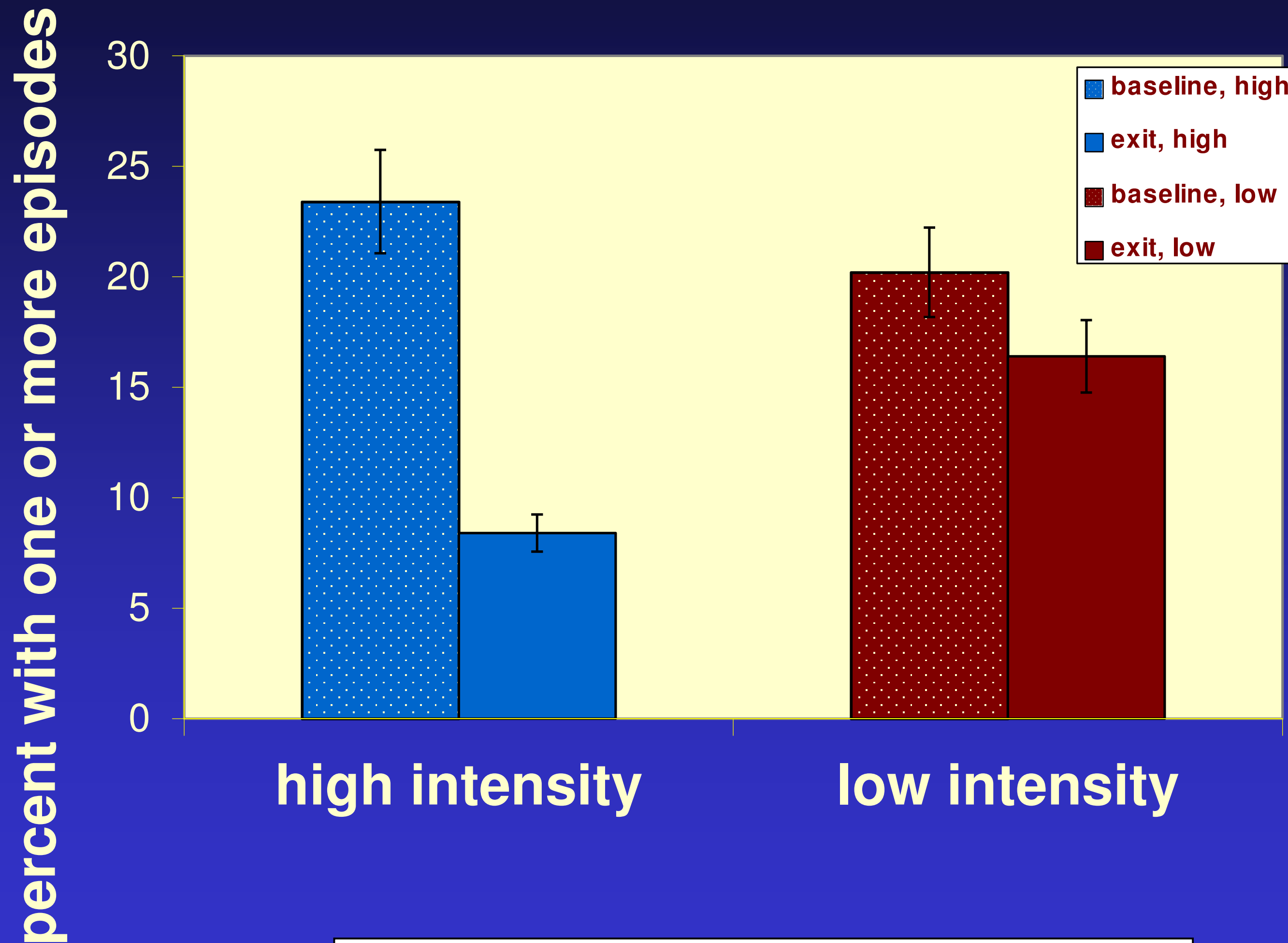
- Lay people from the community
- Share culture, language and life experiences with clients
- Personal experience with asthma

- Skilled at building trusting and supportive relationships with clients
- Bridge between community and service providers
- Receive rigorous and standardized training

Research Design

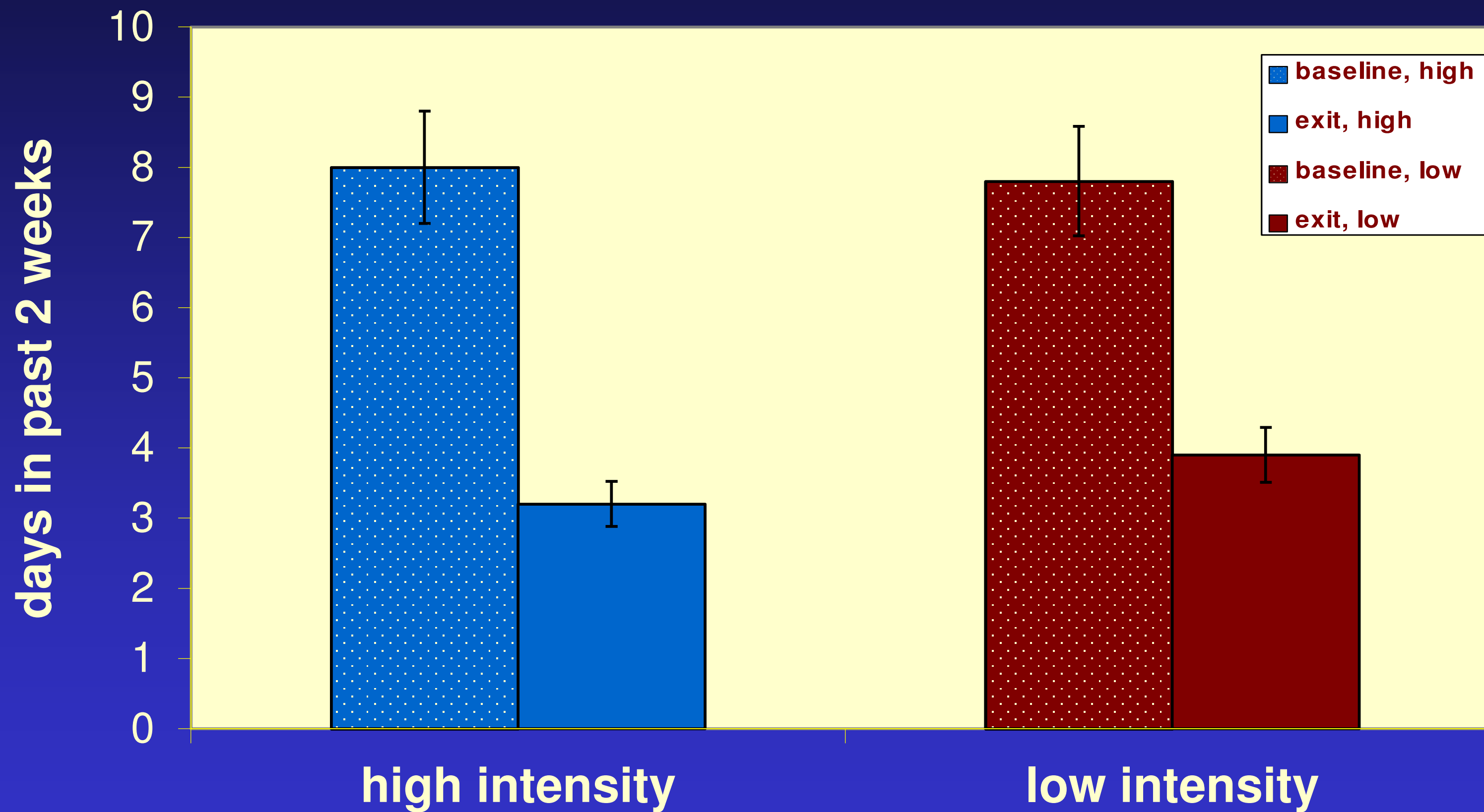
- Eligibility
  - Household income below 200% poverty
  - Child age 4-12 with asthma
- Randomized controlled design
- High intensity group
  - N = 138
  - full intervention
- Low intensity group
  - N = 136
  - One visit, follow-up call, bedding covers only

Outcome: Urgent Health Services



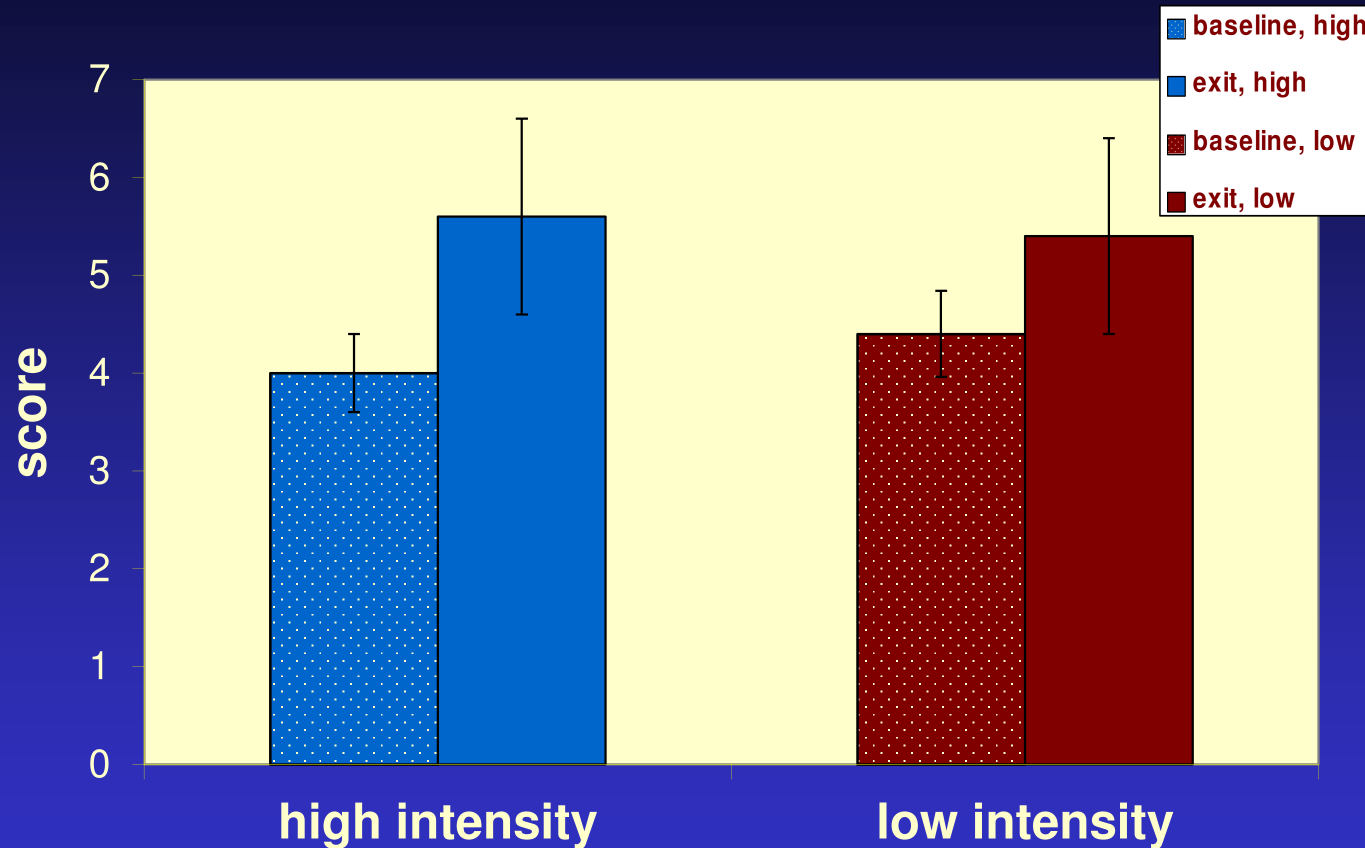
p-values:
0.000 (high intensity, baseline vs. exit, chi-square)
0.414 (low intensity, baseline vs. exit, chi-square)
0.041 (exit, low vs. high intensity, regression adjusted for baseline score)

Outcome: Symptom Days



p-values:
0.000 (high intensity, baseline vs. exit, chi-square)
0.000 (low intensity, baseline vs. exit, chi-square)
0.123 (exit, low vs. high intensity, regression adjusted for baseline score)

Outcome: Caregiver Quality of Life



p-values:
0.000 (high intensity, baseline vs. exit, chi-square)
0.006 (low intensity, baseline vs. exit, chi-square)
0.001 (exit, low vs. high intensity, regression adjusted for baseline score)

Healthy Homes II

Funding source: NIEHS

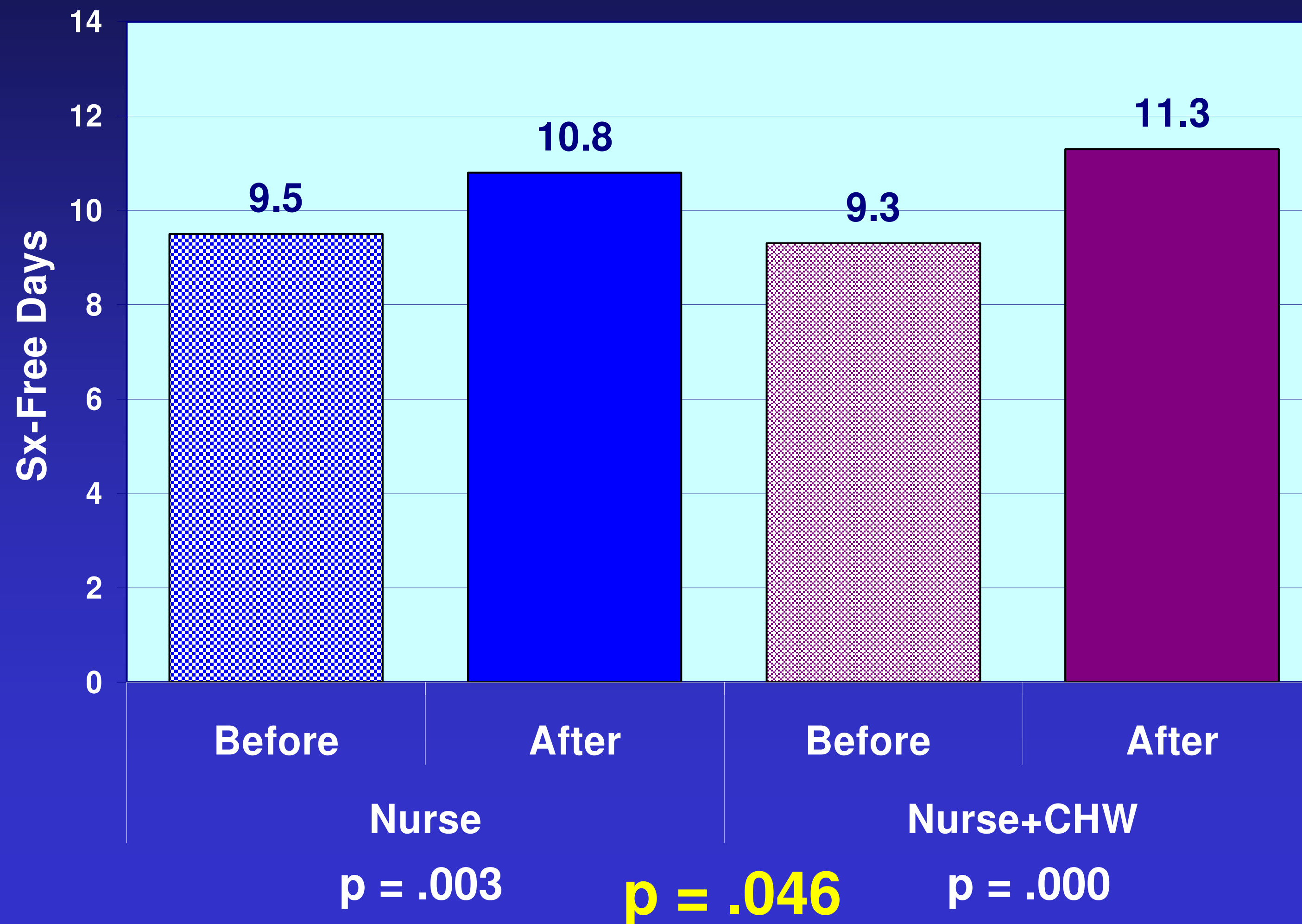
Overview

- Home visits by Community Health Workers
- Address reduction of indoor triggers <u>and</u> improving self-management skills
- Comparison of <u>addition</u> of CHW in-home asthma support to clinic-based nurse-provided education
- RCT of 309 low-income households with children age 3-13 with persistent/poorly controlled asthma
- Published in Archives of Peds and Adol Med 2009

Research Design

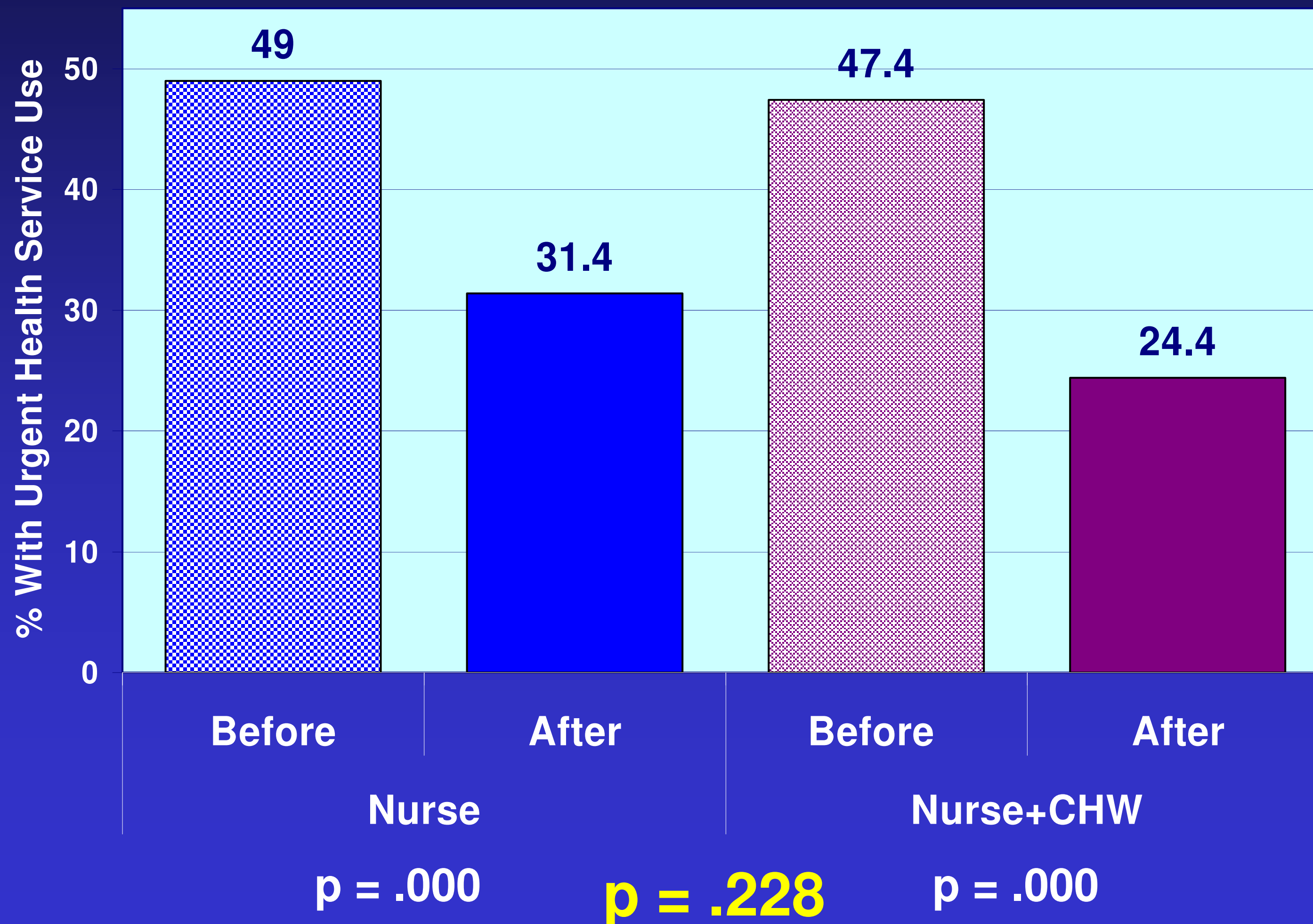
- Eligibility
  - Household income below 200% poverty
  - Child age 3-13 with asthma
- Randomized controlled design
  - Clinic asthma nurse only (153)
  - Clinic asthma nurse + CHW home visits (156)
- Compare outcomes at enrollment and one year later
- Community-based participatory research methods

Symptom-Free Days



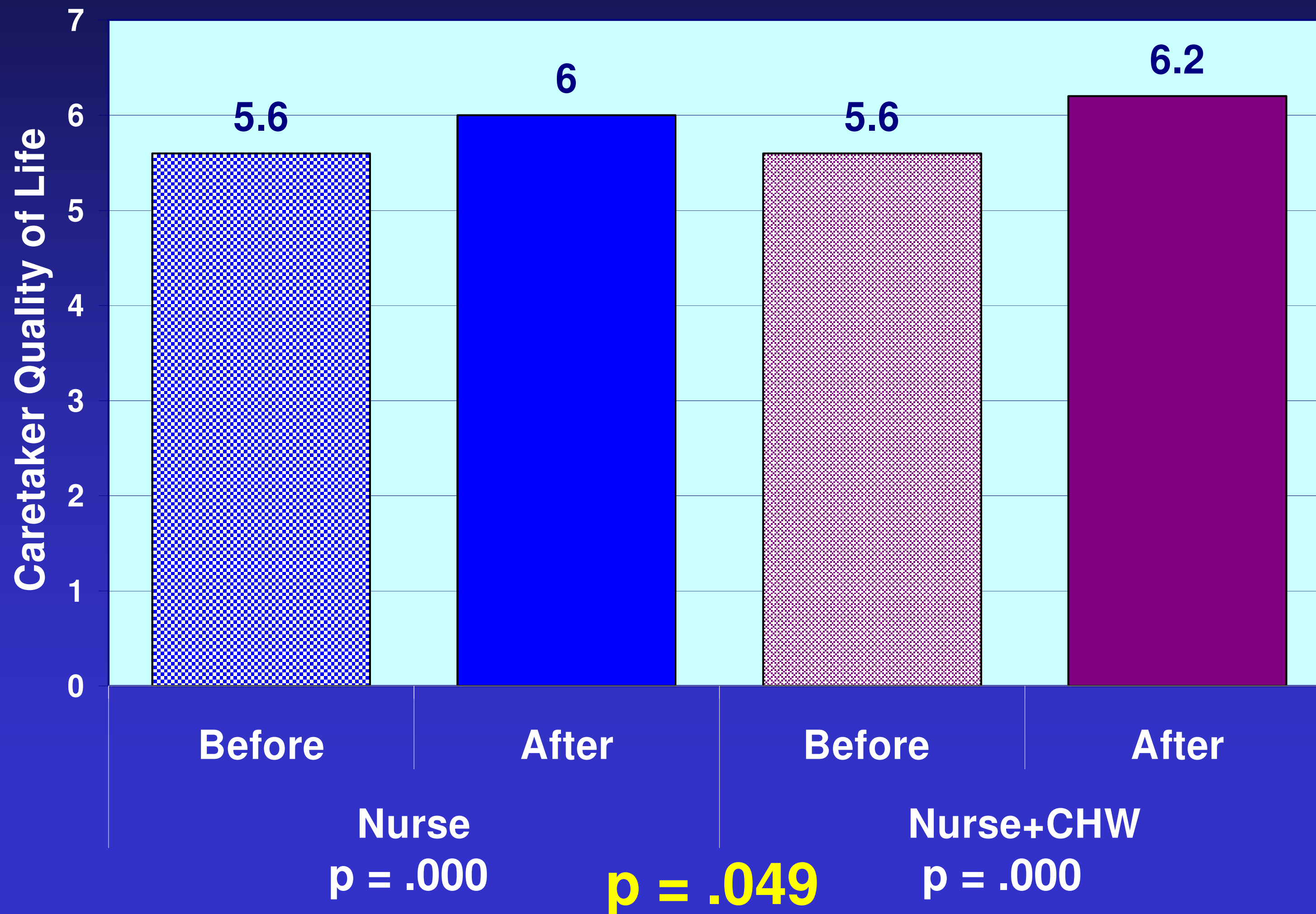
p = .003 p = .046 p = .000

Urgent Health Services Use



p = .000 p = .228 p = .000

Caretaker Quality of Life

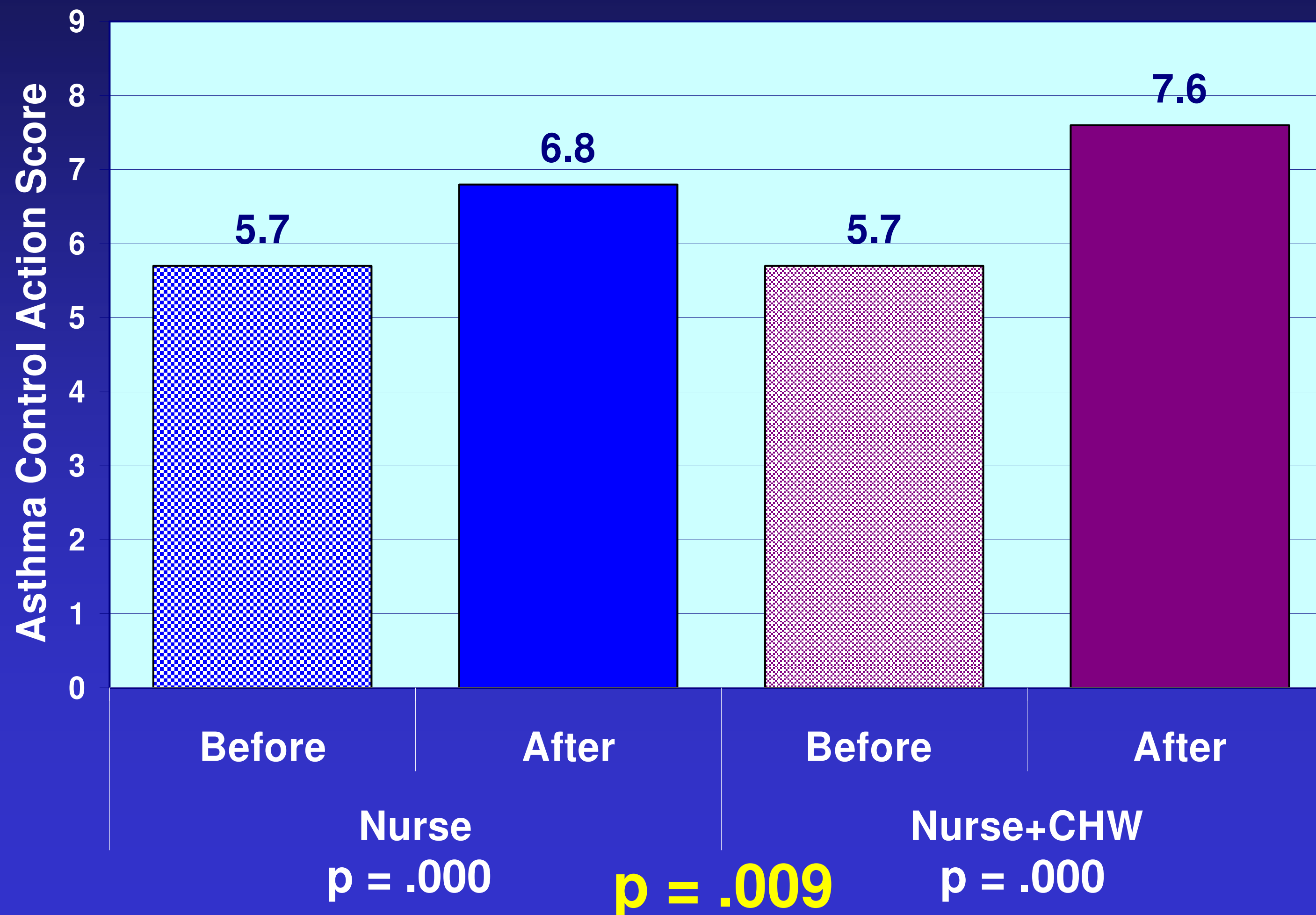


p = .000

p = .049

p = .000

Actions to Control Asthma



p = .000

p = .009

p = .000

Home Visits for Adults: HomeBASE

- Randomized controlled trial comparing intervention to usual-care
- 366 participants
  - Age 18-65
  - Not well controlled asthma or worse
  - Speak either English or Spanish
  - Household income below 250% of federal poverty level
- Intervention
  - Intake visit and 4 follow-up visits by CHW
  - Self-management support
  - Supplies (bedding covers, bedding encasement, cleaning supplies, HEPA air filters, medication boxes)
  - Coordination with primary care

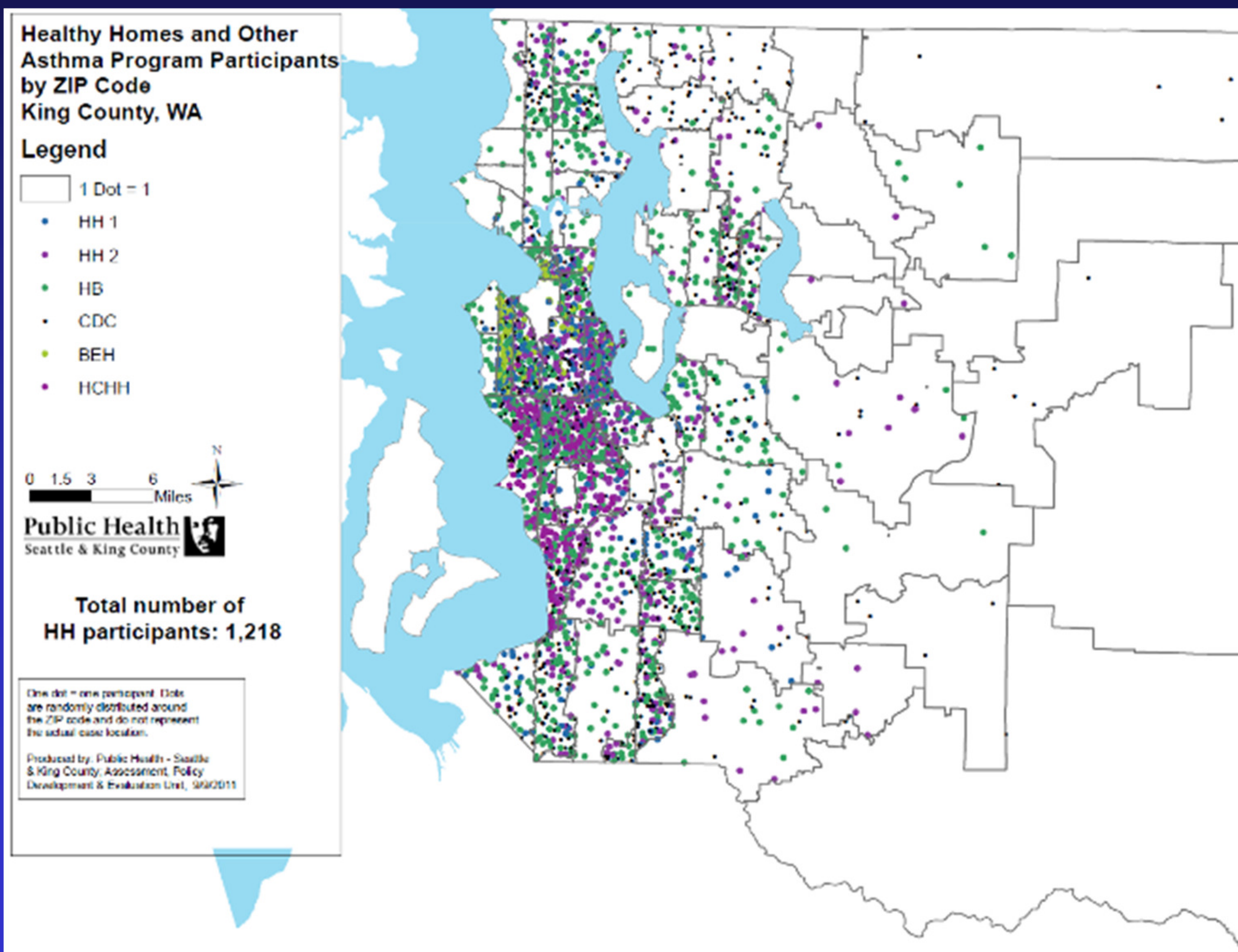
Funding source: NIEHS

HomeBASE
Outcomes

- Outcomes
  - Symptom-free days: 2.1 more per 2 weeks (95% CI = 1.0-3.2, $p < 0.001$)
  - Quality of Life: 0.5 units more (95% CI = 0.3-0.7, $p < 0.001$)
  - Urgent care utilization: no difference
  - ACQ score: 0.56 units better (95% CI = 0.34-0.77, $p < 0.001$)
- Intermediate mediators
  - Better medication use
  - Dust Control
  - Fewer pets
  - Action plan use

Homes We Have Visited

1,218



Conclusions

- Home visits by CHWs that address self-management support and indoor trigger exposure improve asthma outcomes
- Addition of home visits by CHWs to clinic-based education improves asthma outcomes
- CHW home visits add 21 more symptom-free days per year in children, 55 in adults
- Benefits in quality of life and urgent health service use are more modest

Conclusions

- Offering CHW home visits is a promising strategy for reducing asthma disparities
- Offering families a choice of options for self-management support may be optimal
  - Home visits
  - 1:1 clinic-based education
  - Group activities

Key Elements of Home Visit Program

- Visitor: CHW with caseload of 50-60 clients
- Client: Poorly controlled asthma
- Number of visits: Initial and 3 follow-up
- Content
  - Self-management skills
  - Trigger reduction
  - Effective communication with medical provider
  - Coordination with medical home
- Approach
  - Client-centered, motivational interviewing
  - Address psychosocial needs and resource barriers
  - Provide social support

Key Elements of Home Visit Program

- Supplies
  - Vacuum
  - Bedding encasements
  - Cleaning kit
  - HEPA air filter for subset
- Client tracking and follow-up
- Program infrastructure
  - Training and continuing education
  - Supervision of home visitors
  - Clinical back-up
  - Quality monitoring
  - Data system

Implementing Home Visits

- Cost: $1,300 per household
- Recruitment
  - Plan identifies members with poorly controlled asthma
    - Utilization
    - Medications
  - Plan invites member to participate
  - Healthy Homes contacts member and enrolls
- Coordination
  - Visit encounters shared with plan and provider
  - Phone, email and or fax link between CHW and provider and plan chronic disease care coordinator

Implementing Home Visits

- Reimbursement
  - Per member served (fixed charge)
- Evaluation
  - Plan tracks utilization, costs, medications
  - Healthy Homes tracks symptoms, control measures

The End…Thanks