

**Improving Asthma Care in an Integrated Safety
Net Institution Through a Commercially Available
Electronic Medical Record
or
Health Information Technologies
and Asthma
“HIT Asthma”**

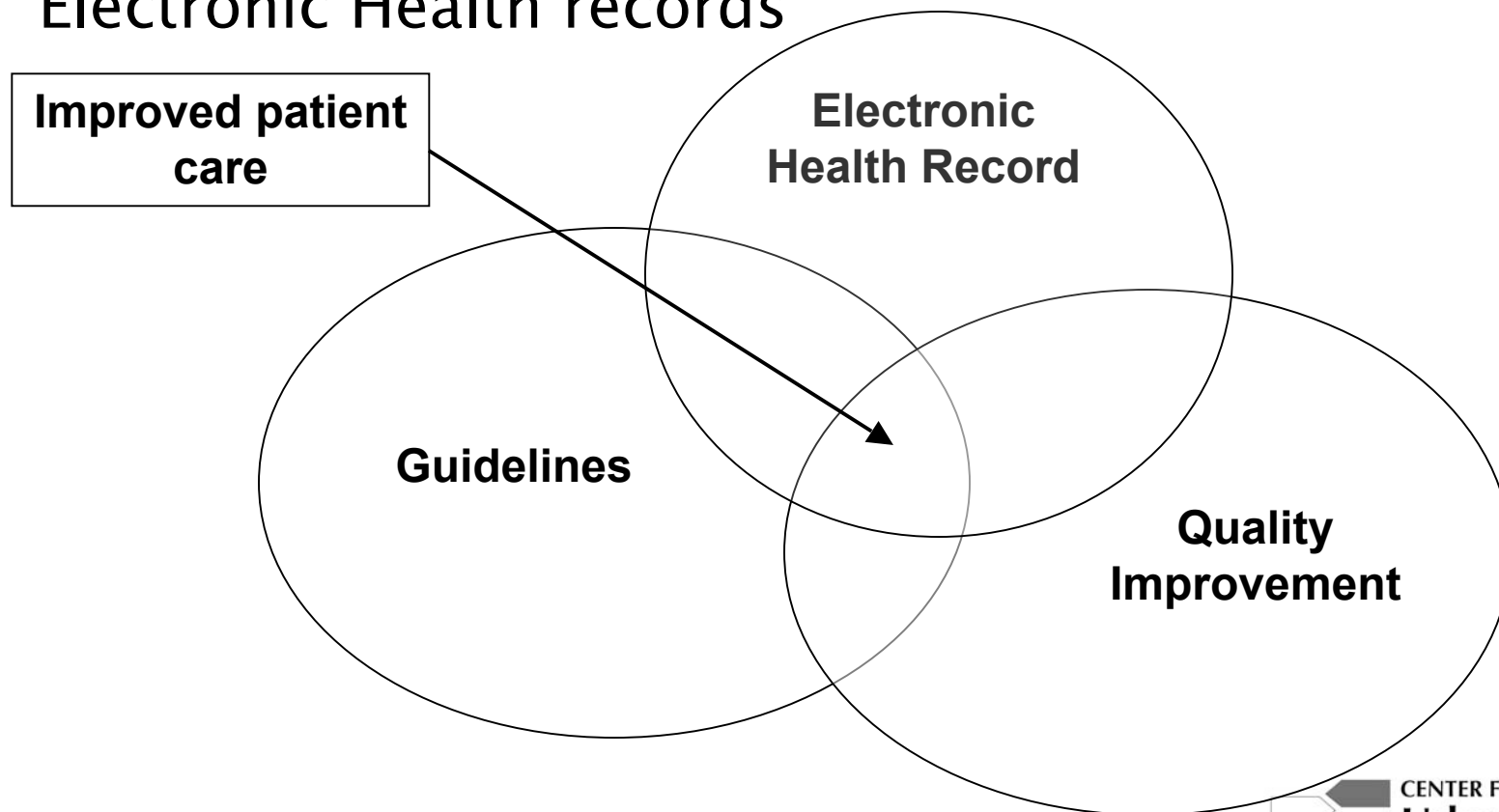
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The HCMC Asthma Quality Improvement Story

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- Guidelines
- Quality Improvement
- Electronic Health records



Asthma Facts

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- Asthma is one of the most common chronic diseases in the United States.
- 15.7 million Americans currently have asthma,
 - ◆ including an estimated 6.5 million children under the age of 18
- Asthma disproportionately impacts people of color, especially women, children and the poor.

The Burden of Asthma in Minnesota*

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- One in 15 children (an estimated 80,000) currently have asthma.
- Among children with asthma, more than half had an asthma attack in the past year.
- 11.8% of adults have been diagnosed with asthma at some point in their lives.

- One in 12 adults (approximately

**From: The Minnesota Department of Health Asthma*

Program Asthma surveillance data 2004

320,000) report that they currently have asthma

Hennepin Health Service Summary Data

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- **Asthma Patients at HCMC – CY2005**

(Defined as individuals who had encounters in which asthma was a primary or secondary diagnostic code)

Inpatients

Unique Pts	Admissions
1,835	2,390
<u>(47% AA –greater than 50% age 36–65 years)</u>	

Outpatients

Unique Pts	Registrations
12,461	23,379
<u>(49% AA –greater than 50% age 19–65 years)</u>	

Emergency/Urgent Care patients

Unique Patients	Registrations
6,152	8,673

Improving Asthma Care (NHLBI-EPR-3)

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- Guideline-based practice will improve and standardize the quality of care given to people with asthma
- “Asthma self management education is essential to provide patients with the skills needed to control asthma and improve outcomes” (p93)
- “Provide all patients with a written asthma action plan for daily treatment and self-management of worsening asthma symptoms” (p93)
- “Develop, implement and evaluate system-based interventions to support clinical decision-making.” (p95)

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 - ◆ The effort to standardize care for a common chronic disease
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NHLBI Asthma Guidelines

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National Asthma Education and Prevention Program: Expert Panel Report

1991 Asthma is an inflammatory disease



1997 Early recognition and treatment



2002 Update on selected topics



2007 Asthma Guidelines Update

2007 Guidelines

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- Distinguishes between Asthma Severity and Control
- Both Severity and Control include domains of current impairment and future risk
 - ◆ **Impairment**: Frequency and intensity of symptoms and functional limitations
 - ◆ **Risk**: The likelihood of asthma exacerbations

Assessment of Asthma Severity/Control

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- **Previous guidelines**
 - ◆ Frequency of Daytime symptoms
 - ◆ Frequency of Nighttime symptoms
 - ◆ Lung function
- **2007 Guidelines**
 - ◆ Impairment
 - ◆ Frequency of Daytime symptoms
 - ◆ Frequency of Nighttime symptoms
 - ◆ Frequency of SABA use
 - ◆ Interference with normal activity
 - ◆ Lung function (FEV₁/FVC for children)
 - ◆ Risk
 - ◆ Exacerbations (frequency and severity)

CLASSIFYING ASTHMA SEVERITY AND INITIATING TREATMENT IN CHILDREN 5-11 YEARS OF AGE

Assessing severity and initiating therapy in children who are not currently taking long-term-control medication.

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<u>Components of Severity</u>		<u>Classification of Asthma Severity (5–11 years of age)</u>			
		Persistent			
		<u>Intermittent</u>	<u>Mild</u>	<u>Moderate</u>	<u>Severe</u>
I M P A I R M E N T	Symptoms	≤2 days/week	≥2 days/week but not daily	Daily	Throughout the day
	Nighttime awakenings	≤2x/month	3–4x/month	>1x/week but not nightly	Often 7x/week
	Short-acting beta ₂ -agonist use for symptom control (not prevention of EIB)	≤2 days/week	>2 days/week but not daily	Daily	Several time per day
	Interference with normal activity	None	Minor limitation	Some limitation	Extremely limited
	Lung function	<ul style="list-style-type: none"> •Normal FEV₁ between exacerbations •FEV₁ >80% predicted •FEV₁/FVC >85% 	<ul style="list-style-type: none"> •FEV₁ =80% predicted •FEV₁/FVC >80% 	<ul style="list-style-type: none"> FEV₁ = 60–80% predicted FEV₁/FVC =75–80% 	<ul style="list-style-type: none"> FEV₁ <60% predicted FEV₁/FVC <75%
R I S K	Exacerbations (consider frequency and severity)	0–2 /year	>2 in one year	→	
		<p>Frequency and severity may fluctuate over time for patients in any severity category</p> <p>Relative annual risk of exacerbations may be related to FEV₁</p>			
Recommended Step for Initial Therapy		Step 1	Step 2	Step 3, medium-dose ICS	Step 3 medium-dose ICS option, or step 4
				option & consider short course of systematic oral corticosteroids	
		In 2–6 weeks, evaluate level of asthma control that is achieved, and adjust therapy accordingly.			

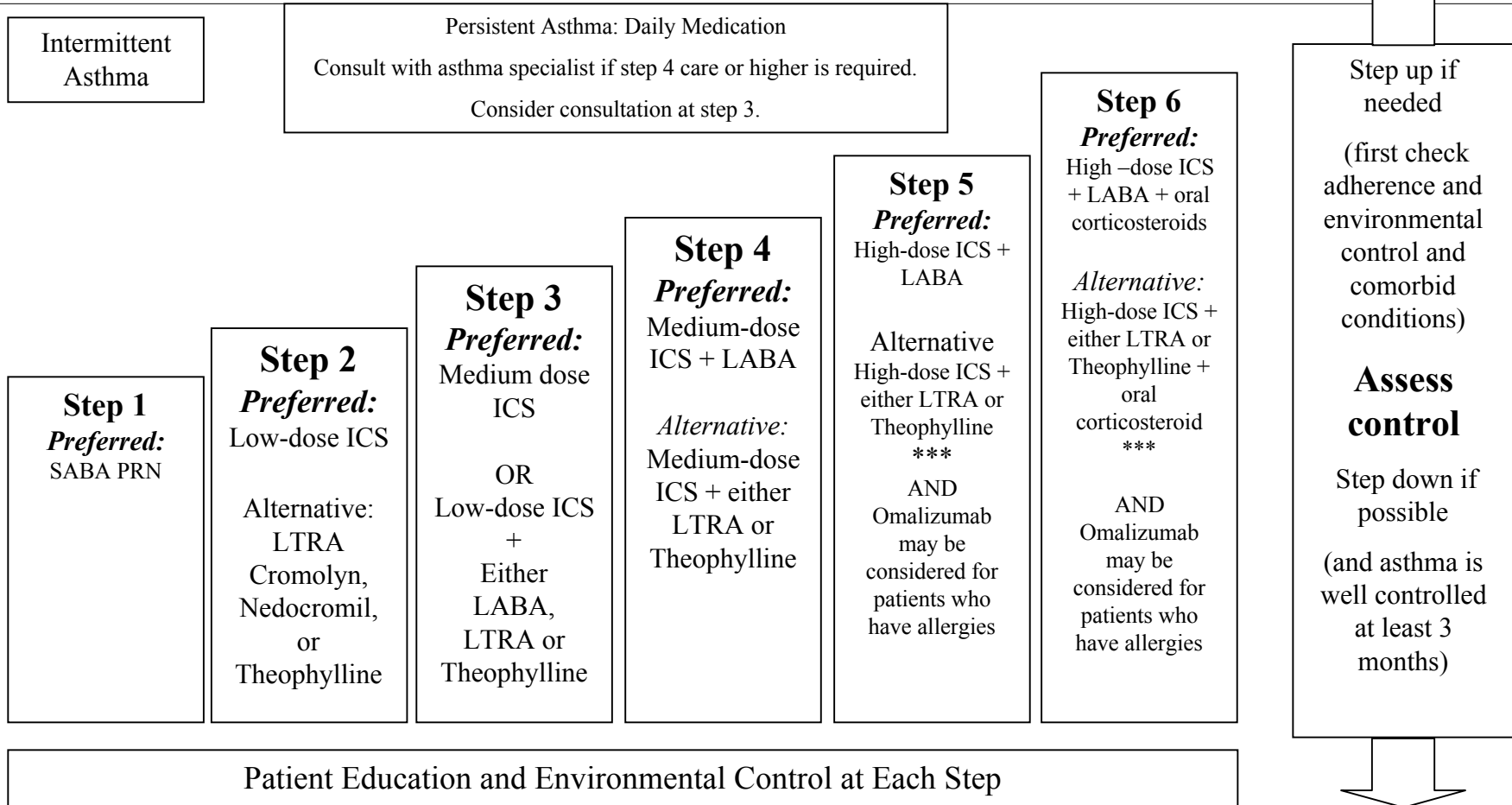
ASSESSING ASTHMA CONTROL AND ADJUSTING THERAPY IN CHILDREN 5-11 YEARS OF AGE

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Components of Control		Classification of Asthma Control (5-11 years of age)		
		Well Controlled	Not Well Controlled	Very Poorly Controlled
I M P A I R M E N T	Symptoms	≤2 days/week but not more than once in each day	≥ 2 days/week or multiple times on ≤ 2 days/week	Throughout the day
	Nighttime awakenings	≤ 1x/month	≥2x/month	≥ 2x/week
	Interference with normal activity	None	Some limitation	Extremely limited
	Short-acting beta ₂ -agonist use for symptom control (not prevention of EIB)	≤2 days/week	>2 days/week	Several times per day
	Lung function •FEV ₁ or peak flow •FEV ₁ /FVC	> 80% predicted/personal best	60-80% predicted/personal best	<60% predicted/personal best
R I S K	Exacerbations	> 80% predicted 0-1 per year	75-80% predicted 2-3 per year	<75% predicted > 3 years
	Reduction in lung growth	Evaluation requires long-term follow up		
	Treatment-related adverse effects	Medication side effects can vary in intensity from none to very troublesome and worrisome. The level of intensity does not correlate to specific levels of control but should be considered in the overall assessment of risk.		
Recommended Action for Treatment		<ul style="list-style-type: none"> •Maintain current step. •Regular follow up every 3-6 months . •Consider step down if well controlled for at least 3 months. 	<ul style="list-style-type: none"> •Step up at least 1 step and •Reevaluate in 2-6 weeks. •For side effects: consider alternative treatment options. 	<ul style="list-style-type: none"> •Consider short course of systemic oral corticosteroids., •Step up 1-2 steps, and •Reevaluate in 2 weeks. •For side effects: consider alternative treatment options.

STEPWISE APPROACH FOR MANAGING ASTHMA IN CHILDREN 5-11 YEAR OF AGE

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Quick Relief Medication for All Patients

- SABA as needed for symptoms. Intensity of treatment depends on severity of symptoms: up to 3 treatments in 20-minute intervals as needed. Short course of systemic oral corticosteroids may be needed.
- Caution: Increasing use of beta-agonist or use >2 times a week for symptom control (not prevention of EIB) indicates inadequate control and the need to step up treatment.

The HCMC Asthma Quality Improvement Story

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- Asthma Guidelines
 - ◆ The effort to standardize care for a common chronic disease
- Quality Improvement
 - ◆ Identify “key aspects” of good asthma care
 - ◆ Monitoring “key aspects” of care (data collection)
 - ◆ Giving feedback to providers with the goal of increasing the inclusion of those key aspects into their patient care
- Electronic Health Record

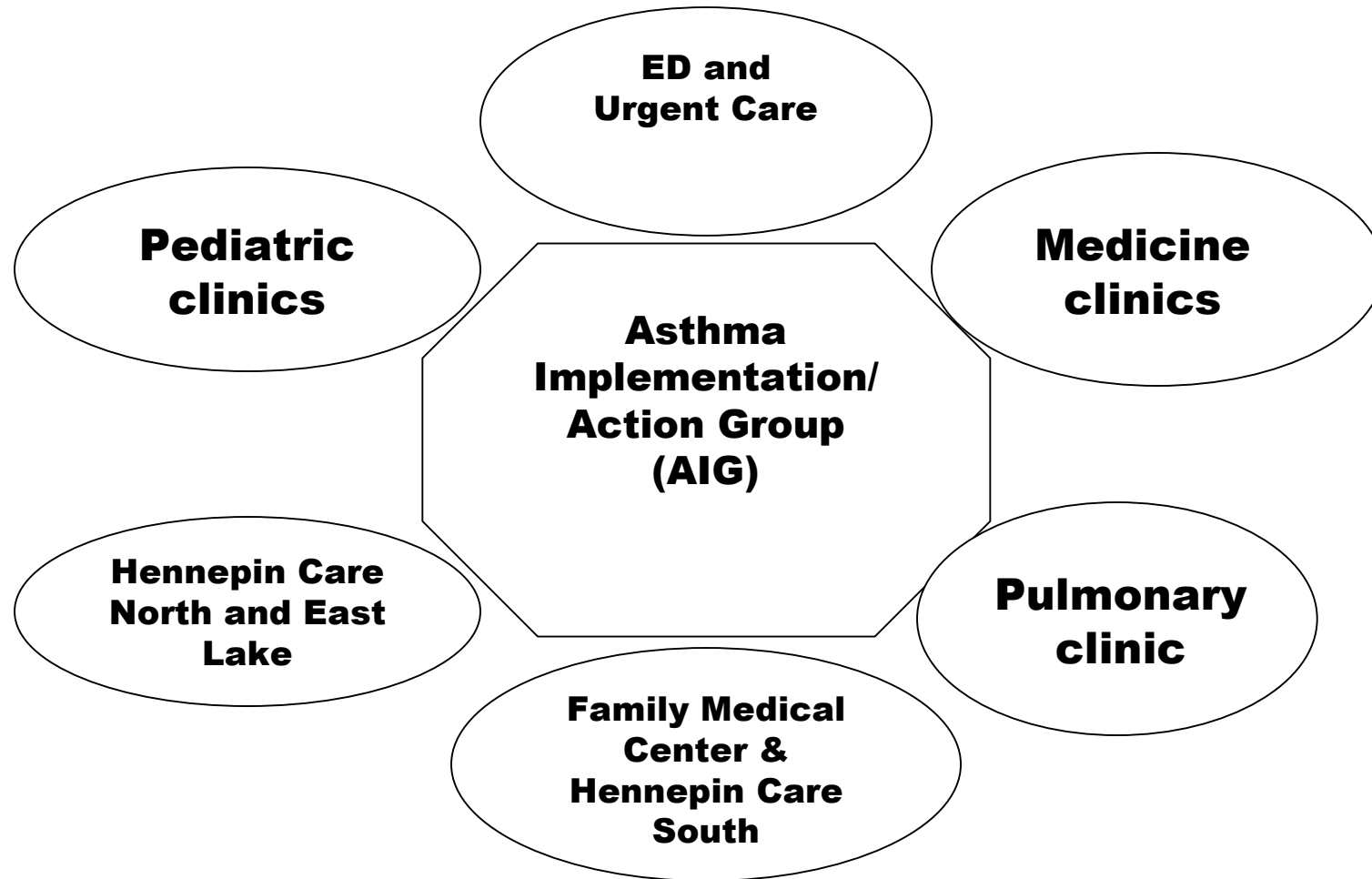
HCMC Joins ICSI

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- Provisional member in January 2006
- Established a Core Team with cross departmental representation
- HCMC ICSI Core Team chooses asthma as its first project
 - ◆ Asthma Management in all outpatient settings
 - HCMC established an Asthma Implementation Group to standardize practices across outpatient settings

HCMC ICSI Asthma Implementation Group

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ICSI Asthma Measures

- Measure—% of patients with asthma severity documented
- Measure—% of patients with persistent asthma on inhaled Corticosteroids (ICS)
- Data collection – Data collected by provider in each site by chart review of a minimum of 30 charts a month or all whichever is greater:

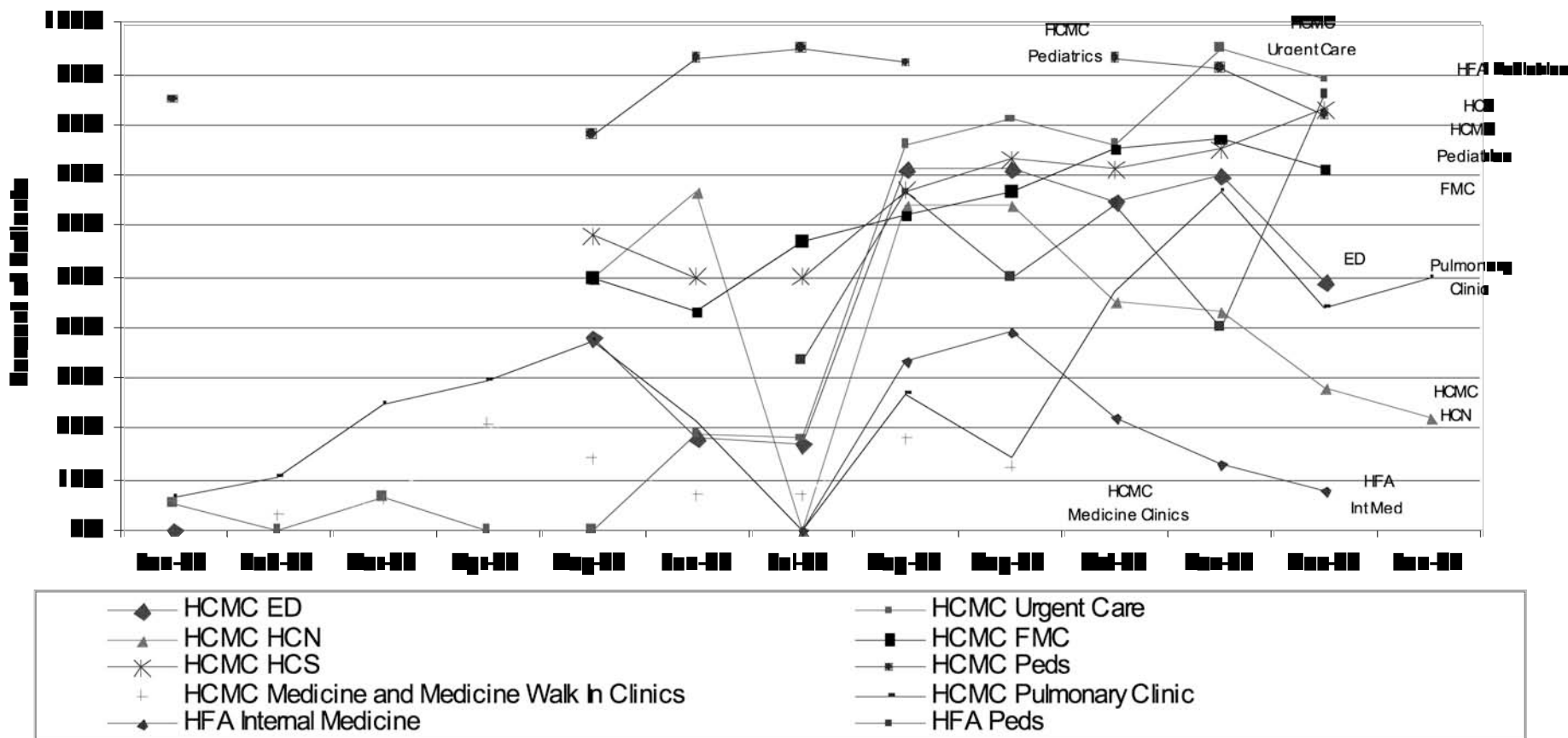
Number of asthma visits at hospital sites for asthma (H) greater than 0000

Site	Number of Visits to Medical Center Documented as a Persistent Asthma		# visits with primary the asthma
	Primary Site	Secondary Site	
Neurology Clinic	000	000	000
Emergency Dept	1000	0000	1000
General Med	000	1000	000
General Medicine	010	0110	000
Medicine	000	0000	000
Family Medical Center	000	000	010
Emergency Room Med1	100	010	100
Emergency Room Med2	100	001	00
Emergency Room Med3	0	10	0
TOTAL	0000	10000	0000

*Emergency Room Med3 is a new site that had started seeing patients in October 2010 year

Outcomes: First year

Weekly Discharge per Bed Week
Note: 100% of Patients will have a Weekly Discharge per Bed Week



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 - ◆ Identify “key aspects” of good asthma care
 - ◆ Monitoring “key aspects” of care (collecting data)
 - ◆ Giving feedback to providers with the goal of increasing the inclusion of those key aspects into their patient care
- Electronic Health Record
 - ◆ Designed for clinical workflow during a patient encounter
 - Health maintenance reminders available with “pop ups”
 - ◆ Not designed to help with clinical decision support
 - ◆ Facilitates data collection

HCMC goes live with Epic

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- Asthma visit template created
 - ◆ Helps with documentation
 - ◆ Does not help to determine asthma severity or control
- Asthma Action Plan created (letters section)
 - ◆ Took too long to complete
 - ◆ Printed out on 3–4 pages
 - ◆ Difficult formatting for health literacy
- ***Is there something “out there” we can use?***

MDH Interactive Asthma Action Plan

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- IAAP launched by MN Department of Health June 2003
 - ◆ Application recognized as a top interactive asthma tool Online and **downloadable** (to a desktop) application to assist providers with:
 - ◆ Assessment of asthma severity,
 - ◆ Choosing appropriate medications
 - Based on the NAEPP 2002 Asthma Guidelines
 - ◆ Writing an Asthma Action Plan in English and Spanish
- ***Could this MDH application be our answer?***

The Challenge...

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- Integrate a computerized decision support tool into an EHR
 - ◆ Easy to access during a patient visit
 - ◆ Easy to complete during a patient visit
 - ◆ Facilitates a high standard of asthma care
 - ◆ Documentation captured in the EHR
 - ◆ Produces a chronic care document for the patient/family (Asthma Action Plan)
- Use this tool to collect data to help our ICSI Asthma Quality Improvement efforts

Why not build this in Epic?

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- Logical complexity
 - ◆ Epic does not offer decision support for disease severity/control for a chronic illness
 - ◆ Epic does not do multi-level decision help for generating complex treatment plans
- Volume of clinical material needed to facilitate a workable application
 - ◆ 33,000 line medication database
- Epic currently unable to print a health literacy appropriate action plan

HIT Asthma Project: Funding

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- May 2007. Agency for Health Research & Quality (AHRQ) releases RFP requesting demos of using health information technology for QI.
- June 2007. Center for Urban Health at HCMC (a program of Mpls Medical Research Foundation) submits proposal in response.
 - ◆ PI. Gail Brottman, MD (asthma specialist)
 - ◆ Co-Investigator. Kevin Larsen, MD (generalist with technology expertise)
 - ◆ Project Director. Yiscah Bracha, MS (research director of CUH)

HIT Asthma Project: Primary Goal

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- To improve the quality and patient-centeredness of ambulatory asthma care for children and adults at Hennepin County Medical Center and associated outpatient clinics, by providing easy access to a clinical decision support tool that would be integrated into the patient care process.

HIT Asthma Project: Deliverables

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- New software (e–AAP) to provide asthma clinical decision support, now based on 2007 guidelines
- Process that launches and completes e–AAP during Epic–based patient encounter
- Registry of HCMC asthma patients
- Evaluation
 - ◆ Software development
 - ◆ Implementation
 - ◆ Change in asthma care quality measures
 - ◆ General impact

HIT Asthma Project: Participants

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- Management: Center for Urban Health
- Implementation Sites: HCMC
- Evaluation: Data Intelligence, Inc
- Software development: Lighthouse Software Solutions, subcontracting from UpNorth Vet, Inc.
- Generous assistance from:
 - ◆ Children's Hospital of Philadelphia, Odeodata Corp., Denver Children's Hospital: Interface ideas
 - ◆ MN Dept of Health

The New IAAP: Simplifying Provider Workflow During an Asthma Visit

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- The application is launched from an “Order” in EPIC
- The provider follows simple screens that contain straightforward clinical questions
- Answers automatically generate:
 - ◆ Assessment of asthma severity and/or control
 - ◆ Age-specific medication recommendations consistent with 2007 NHLBI asthma guidelines
 - ◆ A “Patient friendly” written chronic disease management (asthma) plan (English or Spanish)
 - Printed copy to patient/family
 - PDF accessible from Epic medical record
 - ◆ Visit summary that provider can paste into notes

Link to Asthma QI at HCMC

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- ICSI Asthma Implementation Group (AIG):
 - ◆ Reviews software application to ensure
 - Primary care “friendly” focus
 - Printed AAP for Adults and Children
 - Suitable health literacy
 - Joint Commission Compliant
 - ◆ “Asthma Champion” in clinics, assisting with
 - Provider education
 - Implementation

How this project improves Asthma Care

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- Synthesizes complex guidelines into a user-friendly application which:
 - ◆ Launches directly from Epic clinical workflow
 - ◆ Provides clinical decision support.
- Produces a high-quality asthma action plan
- Creates an asthma population database for population management:
 - ◆ Real-time QI monitoring
 - ◆ Dashboard views
 - ◆ Core measures reports
 - ◆ Quality measures required by JCAHO, MN Community Measurement and others

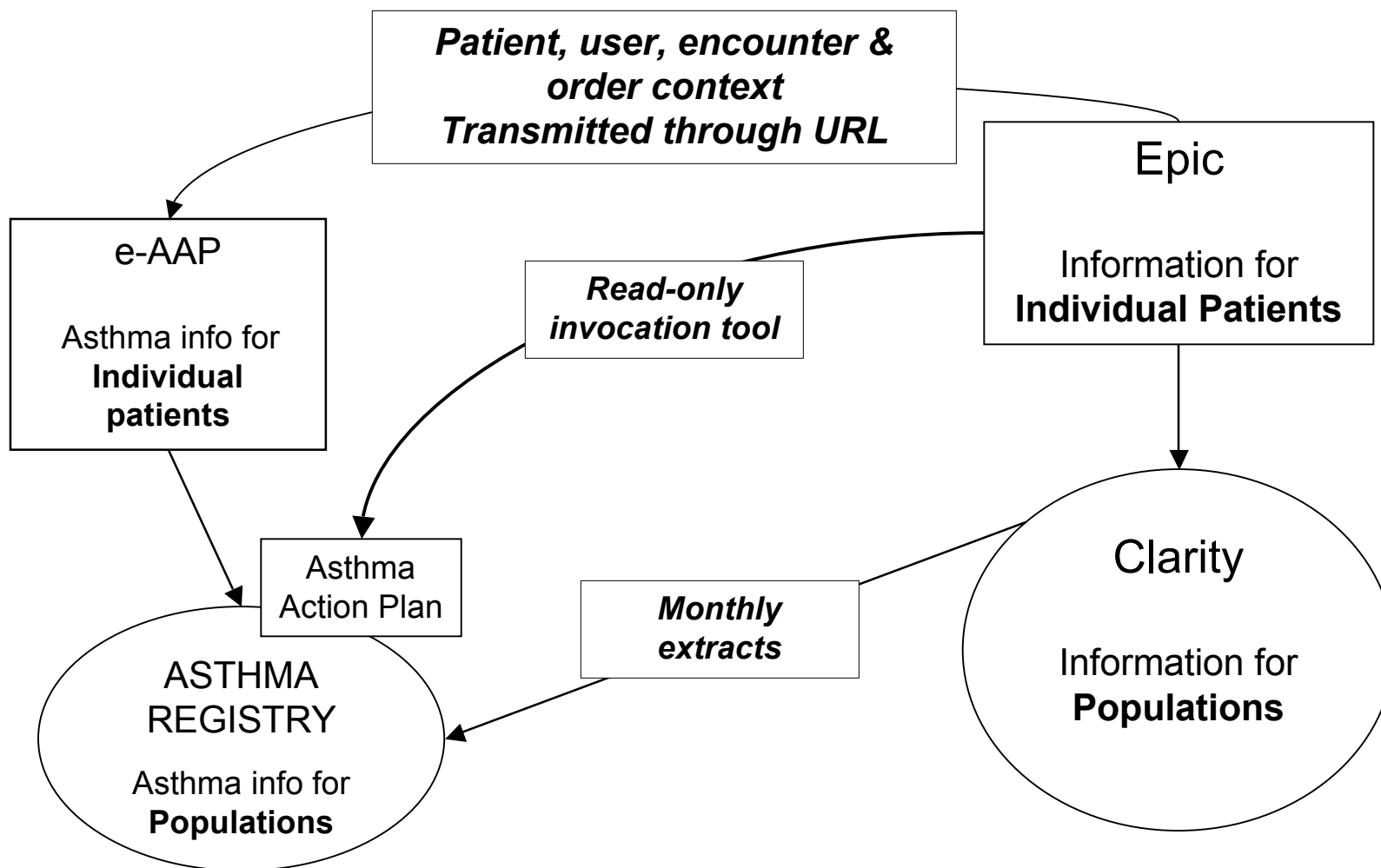
Using a Database to Improve Asthma Care

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- Gives access to consistent/defined information collected on all asthma patients
- Data can identify high risk patients and facilitate the development of intervention strategies
- Allows clinics and providers to set and measure goals for improved asthma care
- Meaningful data queries help to identify how the process of delivering care can be changed to result in improved outcomes.
- Replaces:
 - Manual chart review
 - Manual construction of tables & graphs
 - Potential cost savings of \$92,000

How the integration behaves:

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Plans to Sustain and Improve the Outpatient Asthma Management Gains from 2007

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- Maintenance of an active Asthma Implementation Group (AIG)
- Provide more frequent reminders/education about the program and tools available
- Utilize information from the asthma population database to:
 - ◆ Continue and enhance communication of summary results by clinic site.
 - ◆ Increase *use of* provider-specific data feedback
 - ◆ Encourage sites not meeting goals to address barriers identified

Project Evaluation

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- Monitor the implementation of the e–AAP into the EpicCare Ambulatory EMR;
- Determine the extent to which the e–AAP is utilized by clinicians in the delivery of asthma care;
- Assess the change in rate of documentation of defined indicators of asthma care;
- Determine the extent to which feedback reporting of the indicator rates is utilized by clinicians and clinic administration to promote system changes to enhance asthma care.

Improving Asthma Care in an Integrated Safety Net through a Commercially Available Electronic Medical Record

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Prime contractor: **Denver Health and Hospital Association.**

Subcontractor: **Minneapolis Medical Research Foundation.** Project site: **Hennepin County Medical Center, Mpls MN**

AHRQ Contract No. **HHS290200600020**, Task Order No. **5**

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HCMC e-AAP Application: Live Demonstration
