Using an Online Clinical Process Support System for Quality Improvement and MOC-4: Impact on Asthma Outcomes - Fewer Exacerbations and Visits

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BACKGROUND

- Quality improvement (QI) interventions often require labor-intensive clinical staff training as well as considerable data collection and processing effort.
- An online clinical process support system (CHADIS) has been used to support QI activities using patient generated data resulting in patient-specific decision support for the moment of care.
- MOC-4 QI sessions are held including graphics of patient/clinician data and QI commitments through PDSA methodology. The example here is a QI module for pediatric asthma care for implementation of National Heart, Lung, and Blood Institute (NHLBI) guidelines. A template for asthma care (Asthma Intervention Module or AIM-QI) was created in the CHADIS web system using patient entered pre-visit data including: asthma severity (PACCI), allergen triggers, barriers to adherence, individualized medication suggestions, a "teleprompter" for problem solving counseling, patient-specific education in individual Care Portals, pre-filled online Asthma Action Plans, and between-visit online monitoring.
- Clinician use of AIM-QI reduces the burden of documenting guideline completion and earns MOC-4 credits.
- The effect of the module was tested in a cluster randomized control trial.

OBJECTIVE

To explore the impact of an online Asthma Intervention Module for Quality Improvement (AIM-QI) on asthma control and healthcare utilization via a cluster randomized control study.

DESIGN/METHODS

- **Sample**: 24 community pediatric practices across the US over 27 months (2015-7) used the CHADIS web system for collecting data.
- **Data**: Parents of 4860 children 0-18 years with asthma completed the Pediatric Asthma Control and Communication Instrument (PACCI)[1] online before visits. PACCI assesses asthma severity/control, controller use and adherence, ED visits, hospitalizations, attacks, trajectory and burden.
- **Design**: Practices were randomized to control or use of AIM-QI.
  - Intervention (AIM-QI) patients completed PACCI monthly from home and had access to individualized patient education and Asthma Treatment Plans in an online portal.
  - Controls: Care as usual.
  - MOC-4 program: AIM-QI clinicians had training on and access to decision support: NHLBI guideline tips, a teleprompter for problem solving counseling specific to individual barriers to adherence, guideline-based medication suggestions, and alert reports between visits of patients with uncontrolled asthma.
- **Analysis**: For AIM-QI group, "Post" was defined as the last PACCI 30+ days after starting use of AIM-QI and "Pre" as the first PACCI showing persistent asthma 14+ days prior to Post (n=444). For Controls, Post was the last completed PACCI and Pre was first PACCI with persistent asthma 14+ days prior to Post (n=313). Data was analyzed for children who had >=1 PACCI showing **persistent asthma** and also a PACCI 30+ days after intervention start.

DEMOGRAPHICS & CHARACTERISTICS

		Control		AIM-QI		
DEMOGRAPHICS		N	%	N	%	P
Gender - Male		175	55.9	250	56.3	.914
Ethnicity – Hispanic		74	44.0	43	12.3	<.001
Race	White	109	34.8	179	40.3	.125
	Black	28	9.0	139	31.3	<.001
	Asian	1	0.3	24	5.4	<.001
	American Indian	11	3.5	4	0.9	.011
	Other	28	9.0	16	3.6	.002
		Mean	SD	Mean	SD	P
Patient Age (Years)		8.9	0.2	8.6	0.2	.362

	Control		AIM-QI		
	N	%	N	%	P
Suburban	278	88.8	216	48.6	<.001
Urban	10	3.2	160	36.0	<.001
Rural	25	8.0	68	15.3	.002
South	140	44.7	265	59.7	<.001
West	157	50.2	81	18.2	<.001
Northeast	16	5.1	68	15.3	<.001
Midwest	0	0	30	6.8	<.001
Co-Located Asthma Specialist	47	15.0	60	13.5	<.001
No Case Manager	165	52.7	100	22.5	<.001

Decision Support
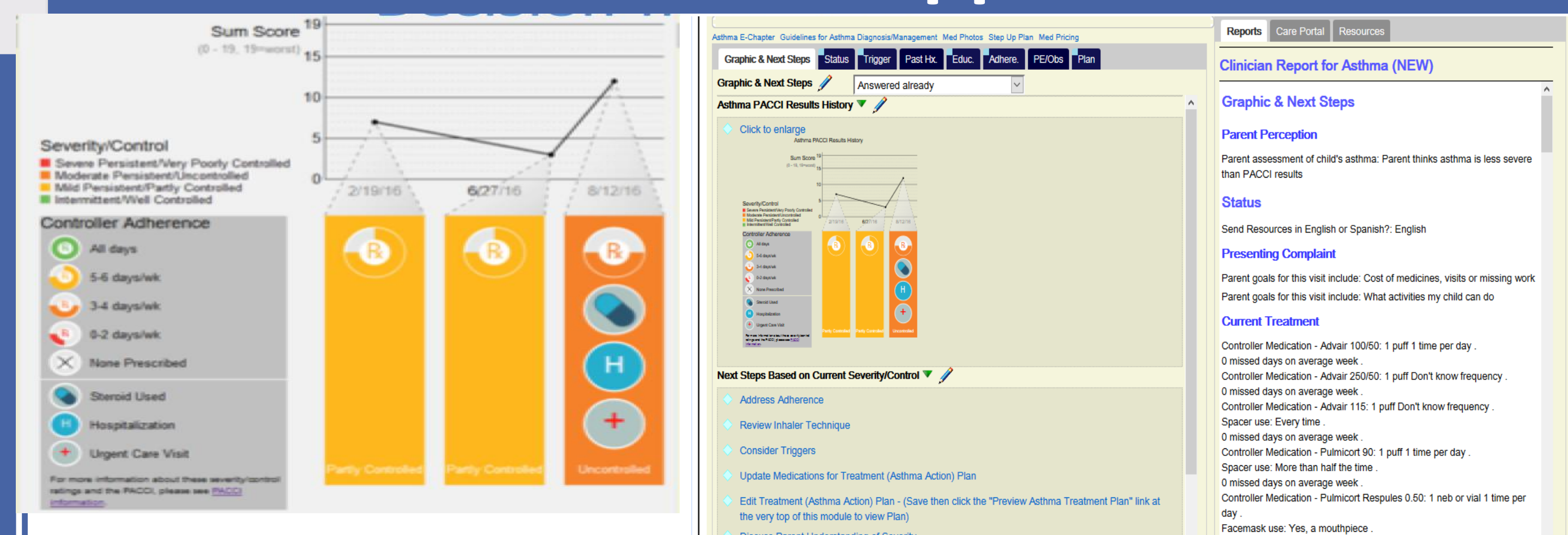
Post Measures for Children with Ever Persistent Asthma						
Measure		Control		AIM-QI		
		N	%	N	%	P
Controlled Asthma		152	48.6	230	51.8	.380
Persistent Asthma on Daily Meds		130	80.8	176	82.2	.711
Ever on Daily Meds		274	87.5	388	87.4	.950
Zero Days - Quick Relief		162	51.8	267	60.1	.022
Zero Nights - Sleep Problems		224	71.6	324	73.0	.670
No Burden From Asthma		189	60.4	282	63.5	.382
Zero Missed Doses		121	48.4	176	53.0	.271
No Symptoms Past Week		128	40.9	195	43.9	.407
"Better" Asthma Trajectory		199	63.6	233	52.5	.002
"Better" among those not controlled at Post		81	50.3	76	35.5	.004
"Same "Asthma Trajectory		102	32.6	184	41.4	.013
"Same" among those controlled at Post		32	21.1	70	30.4	.042
Worse Asthma Trajectory		12	3.8	27	6.1	.168
Poorly Controlled at Pre, on Controller Med at Post		130	80.8	29	100.0	.010
Steroid Bursts		77	24.6	83	18.7	.050
Hospitalized for Asthma	Pre	10	3.2	17	3.8	.643
	Post	8	2.6	8	1.8	.477
ED or Urgent Care Visits	Pre	40	12.8	55	12.4	.873
	Post	23	7.4	25	5.6	.340
		Mean	SD	Mean	SD	P
Acute Asthma Visits (Non-ED or Urgent - Past 3 Months)		0.37	0.06	0.21	0.03	.009
PACCI Sum Score (Worse >3)		3.09	0.19	2.95	0.17	.582
PACCI Problem Index		1.18	0.08	1.10	0.07	.476

RESULTS & DISCUSSION

- There was no Pre difference between groups in PACCI problem index.
- AIM-QI group had more days of no quick relief medication use (p = .022) and fewer steroid bursts (p = .05) implying fewer asthma attacks.
- Those "poorly controlled" at Pre were more likely to be appropriately on controller at Post in the AIM-QI group (100% vs. 81%, p = .01).
- Mean number of acute asthma visits in the past 3 months was lower in the AIM-QI group (p = .009).
- AIM-QI group was more likely to be on a steady trajectory and already controlled (p = .042) at the end. Control group was more likely to be rated as getting better at the end, but those getting better were more likely to be not controlled than those in the AIM-QI group (p = .004).
- Patients in the AIM-QI condition tended to have fewer hospitalizations, fewer ED or urgent care visits, and tended to have larger Pre-Post drops in utilization.

ASTHMA RESEARCH CONCLUSIONS

- A model MOC-4 QI program using an asthma online clinical process support system by pediatricians showed benefits with less rescue medicine and steroid burst use suggesting fewer attacks and also fewer acute asthma visits.
- Children in the AIM-QI group with initially "poorly controlled" asthma were more often appropriately treated with controller medication.
- Patients with controlled asthma at Post came more from AIM-QI group whether they were rated as (getting) Better or the Same at Post.

MOC QI CONCLUSIONS

- Live interactive webinar MOC-4 QI sessions supported by automated run charts were feasible and requires little staff time.
- Patient generated data entered online before and between visits can improve guideline-based care.
- Decision support specific to patients created by patient generated data may be an advance in clinical process support over EHR templates.
- This web system has potential for supporting a variety of other guideline based QI interventions.

LIMITATIONS

- More Control practices had co-located asthma experts but more AIM-QI practices had case management available. Use of these is unknown.

KEY REFERENCE

Okelo SO, Eakin MN, Patino CM, Teodoro AP, Bilderback AL, Thompson DA, Loiaza Martinez A, R and CS, Thyne S, Diette GB, Riekert KA (2013) The Pediatric Asthma Control and Communication Instrument asthma questionnaire: For use in diverse children of all ages. J Allerg Clin Immunol. 132(1):55-72.