Evidence Table 8. Patient/Provider Education: Methods for Improving Systems Support

Abbreviations used in table:

ED	**emergency department**
FEV_1	**forced expiratory volume in 1 second**
GP	**general practitioner**
OR	**odds ratio**
PCP	**primary care physician**
PLE	**peer-leader education**
RR	**relative risk**
95% CI	**95% confidence interval**

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A. CLINICAL PATHWAYS

Citation (Sponsor)	Study Design	Purpose/ Objective	Study N (Number Evaluable)	Population Characteristics	Asthma Severity at Baseline (If Reported)	Treatment	Assessment/ Off-Treatment Followup	Lung Function	Resource Use	Morbidity	Knowledge/Quality of Life/Self-Care Behavior
Johnson et al. Effectiveness of a clinical pathway for inpatient asthma management. Pediatrics 2000;106(5): 1006–1012. (The Johns Hopkins Miracle Telethon Funds, The Johns Hopkins Children's Center)	Randomized controlled trial	To determine the impact of a clinical pathway for inpatient asthma management on the patients' duration of hospitalization, amount of bronchodilator therapy, and frequency of readmissions within 2 weeks of discharge	112 (110)	**Age** 2–18 yr; mean, 7.2 yr **Gender** 64% male, 36% female **Ethnicity** 95% Black **Insurance** 80.5% medical assistance **Caregiver education** 36% high school graduate	Admitted to hospital with asthma exacerbation Supplemental oxygen on arrival, 93.5% Supplemental oxygen at admission, 37% Respiratory rate on admission, 39 Management in ED: 29% had prednisone before arrival; 38% had albuterol nebulizers; mean, 6.1 albuterol doses	**Intervention group (E)** Care was given according to clinical pathway. Key factors included nurse-driven protocol for weaning from bronchodilators, peak flow measurement (for children older than 5 yr) every 4 hours, asthma teaching essentials, prescriptions for home therapies given before discharge, early contact between attending physician and private medical doctor to establish plan for asthma management and improve coordination of care. (n=55–57; n=55 completers) **Control group (C)** Usual care was given, including vital signs before administering each nebulized beta-agonist, notification of house officer before administering beta-agonist if requested, education about use of inhaler and spacer, and some coordination of postdischarge care. (n=55–57; n=55 completers)	Telephone followup 1 day, 1 week, and 2 weeks after discharge for all patients		Lower room charges in E group vs. C group ($2,407 vs. $3,116; p <0.001) and lower respiratory therapy charges for E group vs. C group ($42 vs. $250; p <0.001).	Duration of stay was 13 hours shorter for E group vs. C group (40.3 vs. 52.7 hours, p <0.01). E group had a larger percentage discharged within first 23 hours of admission (38% vs. 14.5%, p <0.01). Shorter duration of every 2 hour neubilzed beta-agonist occurred for E group vs. C group (p=0.02). E group received fewer doses at every dosing interval (p <0.05). One patient in each group called care provider because of worsening symptoms in the 2 weeks after discharge.	
Zorc et al. Scheduled follow-up after a pediatric emergency department visit for asthma: a randomized trial. Pediatrics 2003;111(3): 495–502. (Pew Charitable Trusts; University of Pennsylvania Research Foundation)	Randomized controlled trial (ED of urban children's hospital)	To assess the efficacy and feasibility of providing a PCP followup appointment after an ED visit for asthma	286 (278)	**Age** 2–18 yr; mean, 7.8 yr **Gender** 62% male, 38% female **Ethnicity** 94% Black **Insurance** 62% medical assistance, 31% commercial, 7% none	69% had persistent asthma symptoms. Acute symptoms requiring treatment with bronchodilator in the ED: 50% nonurgent/urgent and 50% emergent/critical In past year: 58% with 2 or more PCP asthma visits, 55% with 2 or more ED asthma visits, 38% with asthma hospitalization 38% were using preventive medication daily.	**Intervention group (E)** Standard discharge instructions were given, plus staff took guardian to telephone and together attempted to contact the PCP and schedule a followup appointment. When an appointment could not be scheduled after 2 attempts, study staff called to assist with obtaining appointment. (n=139) **Control group (C)** Standard discharge instructions were given, including instructions to followup with PCP within 3–5 days. (n=139)	Outcomes were assessed by telephone interview 4 weeks after ED visit and confirmed by PCP record review.			Followup visits were scheduled in the ED for 24% of E group participants. A greater proportion of the E group vs. the C group reported seeing a PCP (77% vs. 51%, p <0.001). Based on telephone report and/or verification with PCP, 64% of E group and 46% of C group had a followup visit within 4 weeks (diff 18%, 95% CI 6% to 29%). Followup rates did not differ by gender, race, age, insurance, or primary care type. Median days to PCP visit were lower for E group vs. C group (13 vs. 54 days, p=0.003). No difference was found between E and C groups in missed school or work or percentage using controller medication daily.	

B. SYSTEM-BASED INTERVENTIONS AND CLINICAL DECISION SUPPORT

Citation (Sponsor)	Study Design	Purpose/ Objective	Study N (Number Evaluable)	Population Characteristics	Asthma Severity at Baseline (If Reported)	Treatment	Assessment/ Off-Treatment Followup	Lung Function	Resource Use	Morbidity	Knowledge/Quality of Life/Self-Care Behavior
McCowan et al. Lessons from a randomized controlled trial designed to evaluate computer decision support software to improve the management of asthma. Med Inform Internet Med 2001;26(3): 191–201.	Quasi-experimental trial (practices randomly assigned; no mention of statistical adjustment for clustering effect)	To investigate whether computer decision support software used in the management of patients with asthma improves clinical outcomes	41 practices (17 practices; 477 patients) 30 patients from each practice randomly selected from the asthma register	**Practice Characteristics** Average number of partners, 3.5 Average practice population, 5,842 **Patient Characteristics** **Age** Mean = 35.9 yr **Gender** 47% male, 53% female		**Intervention group (E)** Decision support software was supplied, with instruction on how to install and use the system on the desktop computer Requested to conduct a clinical review on each preselected patient, using the software (n=16 practices; n=5 completers with 147 patients) **Control group (C)** No specific instructions with regard to their preselected patients (n=25 practices; n=12 completers with 330 patients)	6-month period; followup data collected at 6 months			Proportion of patients in E group who initiated an asthma consultation was lower than in C group (22% vs. 34%, OR 0.59, 95% CI 0.37 to 0.95). No difference was found between E and C groups in primary care assessment of patients or in hospital contacts for asthma. Patients in E group vs. C group had a lower proportion of acute exacerbation of asthma (8% vs. 17%, OR 0.43, 95% CI 0.21 to 0.85) and lower use of emergency nebulizations (1% vs. 5%, OR 0.13, 95% CI 0.01 to 0.91). No difference was found in use of oral steroids to manage attacks.	
Lozano et al. A multisite randomized trial of the effects of physician education and organizational change in chronic-asthma care. Arch Pediatr Adolesc Med. 2004;158(9): 875–883. (Agency for Healthcare Research and Quality; National Heart, Lung, and Blood Institute)	Randomized controlled trial (practices randomly assigned; analysis adjusted for clustering effect)	To evaluate the effectiveness of a peer-leader education intervention and a planned-care intervention incorporating organizational change along with a peer-leader versus no intervention beyond guidelines dissemination and printed patient education material	42 practices; 638 children (42 practices and 554 children) Practices associated with 4 managed care organizations	**Age** 3–15 yr, mean = 9.4 yr **Gender** 60% male, 40% female **Ethnicity** 66% White, 17% African American, 5% Hispanic, 11% other **Maximum Household Education** ≤high school, 12%; some college, 37%; college graduate, 52%	Mild-to-moderate persistent asthma FEV_1 % pred.: 11% had 0–80; 14% had 81–90; 49% had >90 Medications: 28% cromolyn/nedocromil, 34% inhaled steroid, 55% inhaled anti-inflammatory, 74% reliever Asthma symptom days in past 14 days: median, 2.0; mean, 4.1; 29.2% none Oral steroid burst in past 2 months, 36% In past year: hospitalized for asthma, 4%; ED visit for asthma, 23%	**Peer-Leader Education (PLE)** One physician in each practice was to serve as peer-education leader. Leader training included 2 workshops, central support by an education coordinator, and an ongoing learning network for peer leaders. (n=14? clinics and 226 patients; n=203 completers) **Planned Care Intervention** (**PC**) PLE plus a comprehensive approach that focuses on changing attributes of the system of care Intervention included planned asthma visits with a trained asthma nurse. Nurse training included a 1-day training session and 1-hour conference calls for 10 weeks. (n=14 clinics? and 213 patients; n=173 completers) **Control group (C)** Usual care consisting of providing a copy of guidelines and patient education materials for the clinic (n=14? clinics and 199 patients; n=178 completers)	2-year trial. Outcomes were assessed every 8 weeks by telephone survey.			Compared to the C group, children in the PC group had fewer symptom days per year (13.3 days, 95% CI –24.7 to –2.1; –12% from baseline, p=0.02) and lower oral steroid burst rate (39% decrease, 95% CI 11% to 58%; –0.26 burst/yr). Compared to children in C group, those in PLE had fewer symptom days per year (6.5 days, 95% CI –16.9 to 3.6, p = 0.20) and lower oral steroid burst rate (36%, 95% CI 11% to 54%; –0.24 burst/yr). Compared to children in the C group, those in PC showed change in physical health (3.68 points, p=0.05) and child emotional (6.42 points, p=0.02) dimensions of function status; children in the PLE group showed change in child activity (3.89 points, p=0.03) and child emotional (6.47, p=0.03) dimensions. Based on parental report, PC subjects had increased regular controller use vs. those in the C group (rate ratio 1.05, 95% CI 1.00 to 1.09) with no effect of the PLE on controller use.	