

## **Evidence Table 7. Patient/Provider Education: Methods for Improving Clinician Behaviors—Implementing Guidelines**

**Abbreviations used in table:**

ED	emergency department	PBL	problem-based learning
GP	general practitioner	RR	relative risk
OR	odds ratio	95% CI	95% confidence interval

\* indicates primary outcome

## Evidence Table 7. Patient/Provider Education: Methods for Improving Clinician Behaviors— Implementing Guidelines

Citation (Sponsor)	Study Design	Study Population		
		Study N (Number Evaluable)	Population Characteristics	Asthma Severity at Baseline (If Reported)
Evans et al. Improving care for minority children with asthma: professional education in public health clinics. <i>Pediatrics</i> 1997;99(2):157–164. (Stony Wold-Herbert Fund; National Heart, Lung, and Blood Institute)	Quasi-experimental design (2 panels of 11 clinics each created to maximize balance of ethnicity, total clinic population, and caseload of asthma patients randomly assigned to treatment or control; analysis at the clinic level)	22 (22)	<p><b>Staff</b> 22 clinics had collective staff of 37 pediatricians, 42 public health nurses, 42 public health assistants, 13 laboratory technicians, and 16 clerical workers</p> <p><b>Patient Population</b> Mean = 2,800 patients, 36% Medicaid, 45% African American and 33% Latino, 2.25% with asthma</p>	

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Clark et al. Long-term effects of asthma education for physicians on patient satisfaction and use of health services. Eur Respir J 2000;16(1):15–21.  (Lung Division of the National Heart, Lung, and Blood Institute; Arnold P. Gold Foundation)	Cluster randomized controlled trial  (physicians randomly assigned; analysis adjusted for clustering effect)	74 pediatricians; 637 patients enrolled  (67 pediatricians; 369 patients)	<b>Physician Sample</b> <b>Age</b> 30–39 yr, 22%; 40–49 yr, 37%; 50–59 yr, 27%; ≥60 yr, 14% <b>Gender</b> 60% male, 40% female <b>Practice</b> 57% solo, 37% group, 6% multispecialty <b>Patient Sample</b> <b>Age</b> <2 yr, 7%; 2–7 yr, 59%; 8–12 yr, 34% <b>Gender</b> 70% male, 30% female <b>Ethnicity</b> 15% Latino/Hispanic, 15% African American, 70% White <b>Parent Sample</b> 60% 30–39 yr of age; 75% married; 90% high school education or above; 20% of families ≤\$20,000 income, 16% ≤\$15,000 income; 17% receiving government assistance for healthcare	Asthma diagnosis made by physician No other chronic disorders with pulmonary complications At least one emergency medical visit for asthma in previous year

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Lagerløv et al. Improving doctors' prescribing behaviour through reflection on guidelines and prescription feedback: a randomized controlled study. Qual Health Care 2000;9(3):159–165.  (The Norwegian Medical Association's Fund for Quality Improvement; The Research Council of Norway; The Norwegian Community Pharmacy Foundation)	Randomized controlled trial (block randomization of 199 general practitioners (GPs) in 32 blocks of 4–8 GPs; multilevel modeling to adjust for block effect)	199 general practitioners (GPs)	<b>Age</b> Mean = 44.1 yr <b>Gender</b> 77.4% male, 22.6% female <b>Other</b> Mean number of GPs working together, 2.4; Board certified as specialists, 66.8%	
Baker et al. Randomised controlled trial of the impact of guidelines, prioritized review criteria and feedback on implementation of recommendations for angina and asthma. Br J Gen Pract 2003;53(489): 284–291.  (National Health Service R&D programme, UK)	Cluster controlled trial with incomplete block design (practices randomly assigned; analysis adjusted for clustering effect)	81 practices; 1,482 patients before intervention; 2nd sample of 1,567 patients after intervention  Note: Only results related to asthma patients are included here.	<b>Practice Sample</b> Mean number of fulltime general practitioners = 2.6; mean number of parttime general practitioners = 0.5; teaching practices, 22.2%, asthma clinics, 82.7%  <b>Patient Sample</b> <b>Age</b> Mean = 48.2 yr at 1st data collection; Mean = 47.6 yr at 2nd data collection  <b>Gender</b> 44% male, 56% female at 1st data collection; 46% male, 54% female at 2nd data collection	Patients diagnosed with asthma

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Brown et al. Physician asthma education program improves outcomes for children of low-income families. <i>Chest</i> 2004;126(2):369–374.  (Michigan Department of Health and Community Services; Lung Division of the National Heart, Lung, and Blood Institute)	Cluster randomized controlled trial  (physicians randomly assigned; analysis adjusted for clustering effect)	74 pediatricians; 472  (36)  (data reported here are from 36 children from low income families)	<b>(Total sample; characteristics not reported separately for low-income children)</b>  <b>Age</b> ≤2 yr, 6%; 2–7 yr, 66%; 8–12 yr, 28% <b>Gender</b> 72% male, 28% female <b>Ethnicity</b> 73% White, 14% African American, 9% Latino/Hispanic, 4% other <b>Annual Household Income</b> Less than \$20,000 13%; \$20,000–\$40,000, 21%; \$40,000–\$60,000, 24%; \$60,000–\$80,000, 19%; >\$80,000, 24% <b>Insurance</b> Medicaid, 40% <b>Parent Education</b> Less than high school, 4%; high school, 22%; 1–2 yr college, 13%; 3–4 yr college, 22%; >5 yr college, 39%	Persistent asthma, 96%  Moderate/severe disease, 88%
White et al. Randomized trial of problem-based versus didactic seminars for disseminating evidence-based guidelines on asthma management to primary care physicians. <i>J Contin Educ Health Prof</i> 2004;24(4):237–243.	Randomized controlled trial	52  (52)	Family physicians in community practice with no academic affiliation	

Citation/Sponsor	Study Characteristics		Findings			
	Treatment	Assessment/ Off-Treatment Followup	Lung Function	Resource Use	Morbidity	Knowledge/ Quality of Life/ Self-Care Behavior
Evans et al. Improving care for minority children with asthma: professional education in public health clinics. Pediatrics 1997;99(2):157–164.  (Stony Wold-Herbert Fund; National Heart, Lung, and Blood Institute)	<p><b>Purpose/Objective:</b> To assess whether training based on National Asthma Education and Prevention Program guidelines and delivered to professional and support staff in clinics would increase the number of children diagnosed with asthma and receiving continuing care and would improve quality of care by increasing staff use of new pharmacologic and educational treatment methods</p> <p><b>Intervention group (E)</b> Intervention was based on planned organizational change theory and learner-centered teaching to help staff link the goals of continuing care for asthma to the preventive care mission, to help staff resolve organization problems that blocked acceptance of the new approach to asthma care, and to guide teamwork and a sense of owning the program. (n=11 clinics)</p> <p><b>Control group (C)</b> No intervention (n=11 clinics)</p>	<p>A series of five 3-hour sessions over a 5-month period for all clinical staff was followed by two additional 3-hour sessions at the end of the first followup year to reinforce communication skills. 1-year and 2-year followup data from computer database of patient visits and treatment; data from followup interviews with children's caregivers</p>			<p><b>Results at 2 years</b> A greater rate of new asthma patients in E group than C group (40/1000 vs. 16/1000, p &lt;0.01) Percent of returning patients was greater for E group than C group (16% to 42% for E vs. 14% to 12% for C). Total visits for asthma increased for E group (from 1.41 to 2.42) vs. no change for C group (1.30 to 1.24) at year 2 (p &lt;0.001). In E group vs. C group, a higher proportion of patients were given inhaled therapy (25% vs. 2%, p &lt;0.001), spacer devices (26% vs. 1%, p &lt;0.001), and beta-agonist (74% vs. 52%, p &lt;0.05). Caregivers from E group vs. C group reported receiving higher levels of patient education from physicians (71% vs. 58%, p&lt;0.01) and nurses (61% vs. 44%, p &lt;0.05).</p>	

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Clark et al. Long-term effects of asthma education for physicians on patient satisfaction and use of health services. Eur Respir J 2000;16(1): 15–21.  (Lung Division of the National Heart, Lung, and Blood Institute; Arnold P. Gold Foundation)	<p><b>Purpose/Objective:</b> To evaluate the long-term impact of an interactive seminar for physicians based on principles of self-regulation on clinician behavior, children's use of health services for asthma, and parents' views of physician performance</p> <p><b>Intervention group (E)</b> Interactive seminar based on the theory of self-regulation that included (1) optimal clinical practice based on the National Asthma Education and Prevention Program guidelines and (2) patient teaching and communication. (n=38 physicians and 336 patients; n=34 physicians and 202 patients at final evaluation)</p> <p><b>Control group (C)</b> No interactive seminar (n=36 physicians and 301 patients; n=33 physicians and 167 patients at final evaluation)</p>	<p>Seminars delivered in 2 sessions of 2–3 hours each over a period of 2–3 weeks.</p> <p>Physicians completed a midpoint survey within 5 months of the seminar (E) or assigned date (C) and 12 months after the midpoint.</p> <p>Over a 22-month period, patients were evaluated on average within 2 months of the 1st visit subsequent to intervention (midpoint) and 1 yr after the midpoint.</p>			<p>At 2 yr postintervention, children in E group vs. C group had fewer hospitalizations (<math>p=0.03</math>), and those with higher levels of ED use at baseline had fewer subsequent ED visits (<math>p=0.03</math>).</p>	<p>At 2 yr postintervention, physicians in E group vs. C group wrote down for the patient how to adjust dose or timing of medicines when symptoms changed (OR 3.3, <math>p=0.02</math>), provided guidelines on how to adjust therapy (OR 2.4, <math>p=0.02</math>), and used protocol to track elements of education provided (OR 1.9, <math>p=0.01</math>).</p> <p>No difference occurred between E and C groups in amount of time spent with patients (25.9 vs. 29.0 minutes) or proportion for whom physician prescribed anti-inflammatory medicine (87.5% vs. 77.3%).</p> <p>Parents in E vs. C group were more likely to report their physician paid close attention to the family (<math>p=0.03</math>), commended parents for taking right management actions (<math>p=0.02</math>), created exchange of information (<math>p=0.03</math>), inquired about patients' specific fears and concerns regarding new medicines (<math>p=0.02</math>), explained short-term therapeutic plan (<math>p=0.03</math>), and made it easy for the family to follow medication instructions (<math>p &lt;0.01</math>).</p>

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Lagerløv et al. Improving doctors' prescribing behaviour through reflection on guidelines and prescription feedback: a randomized controlled study. Qual Health Care 2000;9(3): 159–165.  (The Norwegian Medical Association's Fund for Quality Improvement; The Research Council of Norway; The Norwegian Community Pharmacy Foundation)	<p><b>Purpose/Objective:</b> To examine the effect on the quality of prescribing by a combined intervention of providing individual feedback and deriving quality criteria using guidelines recommendations in peer review groups</p> <p><b>Intervention group (E)</b> Group discussions were held about diagnosing asthma and common quality criteria found to be acceptable and unacceptable prescribing, based on international and national guideline recommendations. Criteria were subsequently compared with the prescribing histories of the group as a whole over the previous year and then individually for each GP. (n=98; n=98 completers) <b>Comparison group (C)</b> Intervention, as above, focused on urinary tract infection (n=101; n=101 completers)</p>	<p>Two evening meetings about 1 week apart; duration, on average, 2 hours and 45 minutes.</p> <p>Questionnaires regarding patient monitoring, prescribing, and education were mailed to GPs 6 months after the intervention.</p>				<p>GPs in the E group increased the proportion of acceptably treated asthma patients by 5.9% relative to GPs in the C group (<math>p=0.018</math>) and by 21% relative to the preintervention value in the E group.</p> <p>Among GPs in the E group, 73% indicated they would change, 23% said they probably would change, and 4% said they would not change their treatment of asthma as a result of the intervention.</p>

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Baker et al. Randomised controlled trial of the impact of guidelines, prioritized review criteria and feedback on implementation of recommendations for angina and asthma. Br J Gen Pract 2003;53 (489):284–291.  (National Health Service R&D programme, UK)	<p><b>Purpose/Objective:</b> To determine (1) whether recommendations, in the form of systematically developed prioritized audit criteria, are more effective in stimulating improvements in the performance of primary health care teams than recommendations in the format of standard guidelines, and (2) whether the addition of feedback to criteria increases effectiveness (Guidelines were developed by the North of England Guidelines Development Project.)</p> <p><b>Evidence-based guidelines alone (G)</b> Guidelines containing 51 recommendations were graded A to C according to recommendation strength. (n=27 practices; n=483 patients preintervention and n=517 patients postintervention)</p> <p><b>Guidelines in review criteria format alone (CF)</b> Ten review criteria were based on guidelines that included specific clinical guidance. (n=27 practices, n=510 patients preintervention and n=524 postintervention)</p> <p><b>Review criteria supplemented with feedback (CF+F)</b> Review criteria with feedback on performance were based on results of 1st data collection. (n=27 practices, n=489 patients preintervention and n=526 patients postintervention)</p>	First data collection was before administration of interventions; postintervention data collection was after approximately 12 months.				Level of adherence to 10 recommendations before and after interventions was similar for all interventions except for the following: proportion of patients for whom daily doses of beta <sub>2</sub> -agonist had been checked rose from 11.2% to 22.2% in G group and from 15.5% to 20.7% in CF+F group, with no change in CF group (15.3% to 19.9%); the proportion treated with the cheapest inhaled steroid rose from 35.0% to 46.2% in CF group and from 43.0% to 58.9% in CF+F group, with no change in G group (44.5% to 44.6%).

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Brown et al. Physician asthma education program improves outcomes for children of low-income families. Chest 2004;126(2): 369–374.  (Michigan Department of Health and Community Services; Lung Division of the National Heart, Lung, and Blood Institute)	<p><b>Purpose/Objective:</b> To examine the effects of a physician-education program on a high-risk group (i.e., low-income patients) to see whether they benefited equally</p> <p><b>Intervention group (E)</b> An interactive seminar was based on the theory of self-regulation that included (1) optimal clinical practice based on the National Asthma Education and Prevention Program guidelines and (2) teaching of and communication with patients. (n=12 physicians and 17 patients with low income who had complete data)</p> <p><b>Control group (C)</b> No interactive seminar (n=11 physicians and 19 patients with low income who had complete data)</p>	<p>Seminars were delivered in two sessions of 2–3 hours each over a period of 2–3 weeks.</p> <p>A random sample of patients was evaluated at 12 and 24 months after the initial visit that occurred within 22 months after the intervention.</p>			<p>No difference was between E group and C group children in average number of school days missed (8.65 vs. 12.61 days, p=0.48).</p> <p>Children in E group vs. C group were less likely to have used ED (0.21/yr vs. 1.44/yr, p=0.001) and to have been admitted to hospital (0/yr vs. 0.03/yr, p &lt;0.001).</p> <p>No difference was found between the E and C groups in scheduled physician office visits (1.73/yr vs. 3.39/yr, p=0.06).</p>	<p>Parents of E group children were more likely than parents of C group children to report their child had received a prescription for inhaled anti-inflammatory therapy (RR 1.15, 95% CI 0.93 to 1.43, p &gt;0.05) and more likely to receive a written asthma action plan (RR 1.40, 95% CI 0.58 to 3.36, p &gt;0.05).</p> <p>No difference occurred between E and C groups in parents' perceptions of pediatricians' performance.</p>

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White et al. Randomized trial of problem-based versus didactic seminars for disseminating evidence-based guidelines on asthma management to primary care physicians. J Cont Educ Health Prof 2004;24(4):237–243.	<p><b>Purpose/Objective:</b> To investigate the utility and efficacy of the problem-based learning (PBL) approach versus a more traditional lecture in the area of asthma management on knowledge gain, retention over time, attrition rates, and affective responses, while controlling for common confounders</p> <p><b>Problem-based learning (PBL)</b> Case scenario presented by a physician who facilitated a small group discussion completed in a seminar fashion (n=23 with five groups of 3–6 participants; n=20 at final measurement)</p> <p><b>Traditional didactic sessions (C)</b> Traditional medical grand round, with the presentation of a case scenario followed by a didactic lecture delivered in lecture theater format (n=29 with four groups of 4–10 participants; n=20 at final measurement)</p>	<p>Sessions lasted approximately 60 minutes. Data were collected via a case-based questionnaire on scenarios immediately pre- and postintervention and 3 months later.</p>				<p>Performance, attitude, and skill scores improved across time at 2nd administration and were maintained at the 3rd testing, with no difference between groups.</p> <p>Confidence and knowledge scores for both groups increased at the 2nd administration and decreased at the 3rd administration, with no difference between groups.</p>