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

Abbreviations used in table:

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>ED</td>
<td>emergency department</td>
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<tr>
<td>FEV₁</td>
<td>forced expiratory volume in 1 second</td>
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<tr>
<td>GP</td>
<td>general practitioner</td>
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<tr>
<td>OR</td>
<td>odds ratio</td>
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<td>PCP</td>
<td>primary care physician</td>
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<td>PLE</td>
<td>peer-leader education</td>
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<tr>
<td>RR</td>
<td>relative risk</td>
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<tr>
<td>95% CI</td>
<td>95% confidence interval</td>
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### A. CLINICAL PATHWAYS

<table>
<thead>
<tr>
<th>Citation (Sponsor)</th>
<th>Study Design</th>
<th>Purpose/ Objective</th>
<th>Study N (Number Evaluable)</th>
<th>Population Characteristics</th>
<th>Asthma Severity at Baseline (If Reported)</th>
<th>Treatment</th>
<th>Assessment/ Off-Treatment Followup</th>
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<th>Resource Use</th>
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</tr>
</thead>
<tbody>
<tr>
<td>Johnson et al.</td>
<td>Randomized controlled trial</td>
<td>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</td>
<td>112 (110)</td>
<td>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</td>
<td>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</td>
<td>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)</td>
<td>Telephone followup 1 day, 1 week, and 2 weeks after discharge for all patients</td>
<td>Lower room charges in E group vs. C group ($2,407 vs. $3,116; p&lt;0.001) and lower respiratory therapy charges for E group vs. C group ($42 vs. $250; p&lt;0.001).</td>
<td>Duration of stay was 13 hours shorter for E group vs. C group (40.3 vs. 52.7 hours, p&lt;0.01). E group had a larger percentage discharged within first 23 hours of admission (38% vs. 14.5%, p&lt;0.01). A shorter duration of every 2 hour nebulized beta-agonist occurred for E group vs. C group (p=0.02). E group received fewer doses at every dosing interval (p&lt;0.05). One patient in each group called care provider because of worsening symptoms in the 2 weeks after discharge.</td>
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<tr>
<td>Zorc et al.</td>
<td>Randomized controlled trial</td>
<td>To assess the efficacy and feasibility of providing a PCP followup appointment after an ED visit for asthma</td>
<td>286 (278)</td>
<td>Age 2–18 yr; mean, 7.8 yr Gender 62% male, 38% female Ethnicity 94% Black Insurance 62% medical assistance, 31% commercial, 7% none</td>
<td>69% had persistent asthma symptoms. Acute symptoms requiring treatment with bronchodilator in the ED: 50% nonurgent and 50% emergent/critical In past year: 58% with 2 or more PCP asthma visits, 45% with 2 or more ED asthma visits, 38% with asthma hospitalization 38% were using preventive medication daily.</td>
<td>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)</td>
<td>Control group (C) Standard discharge instructions were given, including instructions to followup with PCP within 3–5 days. (n=139)</td>
<td>Outcomes were assessed by telephone interview 4 weeks after ED visit and confirmed by PCP record review.</td>
<td>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&lt;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 (df 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.</td>
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**CLINICAL PATHWAYs**

- **Objective:**
  - **To assess the efficacy and feasibility of providing a PCP followup appointment after an ED visit for asthma**

- **Population Characteristics:**
  - 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.

- **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:**

- 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 (df 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.

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**CLINICAL PATHWAYs**

- **Objective:**
  - **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**

- **Population Characteristics:**
  - Age 2–18 yr; mean, 7.2 yr
  - Gender 64% male, 36% female
  - Ethnicity 95% Black
  - Insurance 80.5% medical assistance

- **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)

**Outcomes:**

- 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).
- A shorter duration of every 2 hour nebulized 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.
**B. SYSTEM-BASED INTERVENTIONS AND CLINICAL DECISION SUPPORT**

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<th>Study Design</th>
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<tr>
<td>McCowan et al.</td>
<td>Quasi-experimental trial (practices randomly assigned; no mention of statistical adjustment for clustering effect)</td>
<td>To investigate whether computer decision support software used in the management of patients with asthma improves clinical outcomes</td>
<td>41 practices (17 practices; 477 patients) 30 patients from each practice randomly selected from the asthma register</td>
<td>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</td>
<td>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 335 patients)</td>
<td>6-month period; followup data collected at 6 months</td>
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<td>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.</td>
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<td>Lozano et al.</td>
<td>Randomized controlled trial (practices randomly assigned; analysis adjusted for clustering effect)</td>
<td>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</td>
<td>42 practices; 638 children (42 practices and 564 children) Practices associated with 4 managed care organizations</td>
<td>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, 23%; some college, 37%; college graduate, 52%</td>
<td>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=147 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)</td>
<td>2-year trial. Outcomes were assessed every 6 months by telephone survey.</td>
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<td>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%; -026 burst/y). 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/y). Compared to children in the C group, those in PLE 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.</td>
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