

Physician Asthma Care Education



Participant
Materials

PACE Participant's Binder Contents

This document contains most of the materials that we recommend be copied and contained in a tabbed binder for each participant:

CLASSIFICATION, ASSESSMENT, THERAPY

- Classification, assessment, and therapy charts, ages 0-4 and 5-11
- Inhaled corticosteroids chart
- Quick relief medications chart

SAMPLE ACTION PLANS

- Sample asthma action plans

COMMUNICATION

- Communication strategies
- Key asthma messages for the patient and family
- Review of concepts
- Physician's record and self-rating

CASES STUDIES

- Case Presentation Worksheets
- Case study worksheets

DOCUMENTATION AND CODING

- Coding at a glance handout
- Coding models handout
- Coding for established patients handout
- Coding for new patients handout

MASTER TRAINERS

- Master trainer contact list

REFERENCES

- Bibliography

In addition to the above materials, we recommend that handouts of all the presentation slides be included in the binder: 3 per page, with space for notes. Please see the PACE website for a downloadable PDF of the handouts.

Articles are not included in this document due to copyright restrictions. In addition to the bibliography, we recommend that you obtain and include in the *References* section of the binder four key articles pertaining to PACE:

Clark, N. M., Gong, M. M., Schork, A., Evans, D., Roloff, D., Hurwitz, M., Maiman, L., Mellins, R. B. "Impact of Education for Physicians on Patient Outcomes" *Pediatrics*, 101(5): 831-836, 1998. Available at: <http://www.pediatrics.org/cgi/content/full/101/5/831>

Clark, N.M., Gong, M., Schork, M.A., Kaciroti, N., Evans, D., Roloff, D., Hurwitz, M., Maiman, L.A., Mellins, R.B.. "Long-term effects of asthma education for physicians on patient satisfaction and use of health services." *European Respiratory Journal*, 16(1): 15-21, 2000. Available at: <http://erj.ersjournals.com>

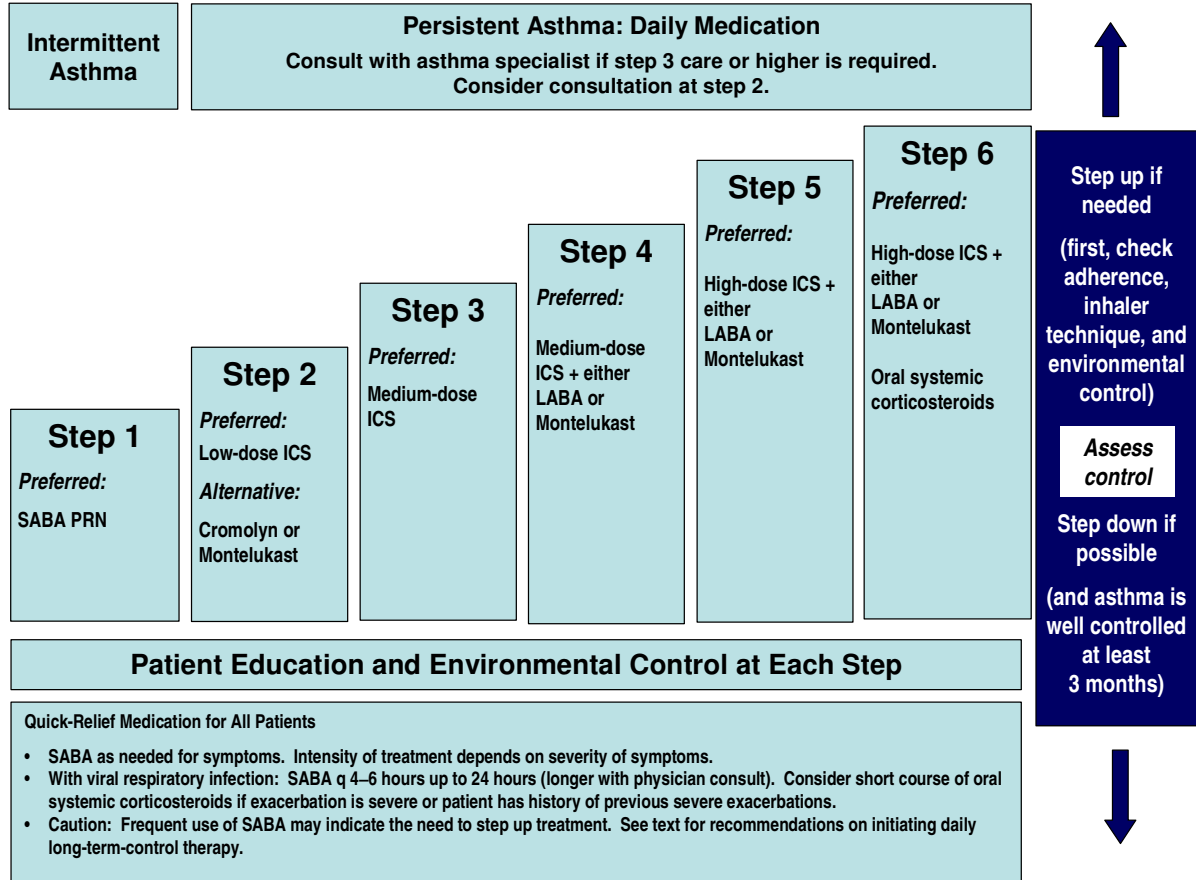
Brown R, Bratton S, Cabana M, Kaciroti N, and Clark NM. "Physician Asthma Education Program Improves Outcomes for Children of Low-Income Families." *CHEST*, 126(2): 369-374, 2004. Available at <http://www.chestjournal.org>

Cabana MD, Shish KK, Evans D, Mellins RB, Brown R, Lin X, Kaciroti N and Clark NM. "Impact of Physician Asthma Care Education on Patient Outcomes." *Pediatrics*, 117(6): 2149-57, 2006. Available at: <http://pediatrics.aapublications.org>

Classification, Assessment, & Therapy



STEPWISE APPROACH FOR MANAGING ASTHMA IN CHILDREN 0–4 YEARS OF AGE



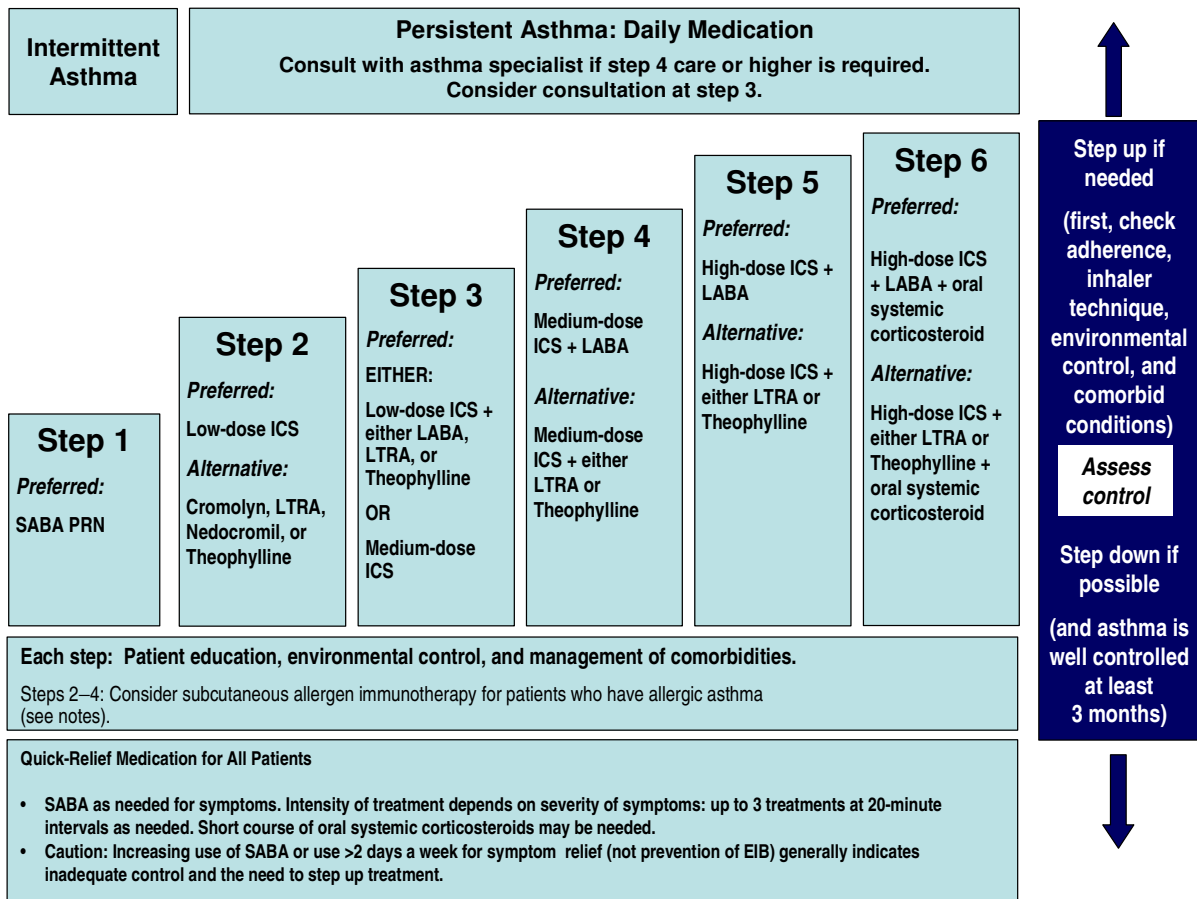
Key: **Alphabetical order is used when more than one treatment option is listed within either preferred or alternative therapy.** ICS, inhaled corticosteroid; LABA, inhaled long-acting beta₂-agonist; SABA, inhaled short-acting beta₂-agonist

Notes:

- + The stepwise approach is meant to assist, not replace, the clinical decisionmaking required to meet individual patient needs.
- + If alternative treatment is used and response is inadequate, discontinue it and use the preferred treatment before stepping up.
- + If clear benefit is not observed within 4–6 weeks and patient/family medication technique and adherence are satisfactory, consider adjusting therapy or alternative diagnosis.
- + Studies on children 0–4 years of age are limited. Step 2 preferred therapy is based on Evidence A. All other recommendations are based on expert opinion and extrapolation from studies in older children.

Source: *Guidelines for the Diagnosis and Management of Asthma*, National Asthma Education and Prevention Program, National Heart, Lung and Blood Institute, August 2007, page 305
Available at: <http://www.nhlbi.nih.gov/guidelines/asthma/index.htm>

STEPWISE APPROACH FOR MANAGING ASTHMA IN CHILDREN 5–11 YEARS OF AGE



Key: **Alphabetical order is used when more than one treatment option is listed within either preferred or alternative therapy.** ICS, inhaled corticosteroid; LABA, inhaled long-acting beta₂-agonist; LTRA, leukotriene receptor antagonist; SABA, inhaled short-acting beta₂-agonist

Notes:

- + The stepwise approach is meant to assist, not replace, the clinical decisionmaking required to meet individual patient needs.
- + If alternative treatment is used and response is inadequate, discontinue it and use the preferred treatment before stepping up.
- + Theophylline is a less desirable alternative due to the need to monitor serum concentration levels.
- + Step 1 and step 2 medications are based on Evidence A. Step 3 ICS + adjunctive therapy and ICS are based on Evidence B for efficacy of each treatment and extrapolation from comparator trials in older children and adults—comparator trials are not available for this age group; steps 4–6 are based on expert opinion and extrapolation from studies in older children and adults.
- + Immunotherapy for steps 2–4 is based on Evidence B for house-dust mites, animal danders, and pollens; evidence is weak or lacking for molds and cockroaches. Evidence is strongest for immunotherapy with single allergens. The role of allergy in asthma is greater in children than in adults. Clinicians who administer immunotherapy should be prepared and equipped to identify and treat anaphylaxis that may occur.

Source: *Guidelines for the Diagnosis and Management of Asthma*, National Asthma Education and Prevention Program, National Heart, Lung and Blood Institute, August 2007, page 306
Available at: <http://www.nhlbi.nih.gov/guidelines/asthma/index.htm>

CLASSIFYING ASTHMA SEVERITY AND INITIATING TREATMENT IN CHILDREN 0–4 YEARS OF AGE

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

| Components of Severity | | Classification of Asthma Severity (0–4 years of age) | | | |
|---|---|--|--|---|-----------------------|
| | | Intermittent | Persistent | | |
| | | | Mild | Moderate | Severe |
| Impairment | Symptoms | ≤2 days/week | >2 days/week but not daily | Daily | Throughout the day |
| | Nighttime awakenings | 0 | 1–2x/month | 3–4x/month | >1x/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 times per day |
| | Interference with normal activity | None | Minor limitation | Some limitation | Extremely limited |
| Risk | Exacerbations requiring oral systemic corticosteroids | 0–1/year | ≥2 exacerbations in 6 months requiring oral systemic corticosteroids, or ≥4 wheezing episodes/1 year lasting >1 day AND risk factors for persistent asthma | | |
| | | ← Consider severity and interval since last exacerbation. Frequency and severity may fluctuate over time. → Exacerbations of any severity may occur in patients in any severity category. | | | |
| Recommended Step for Initiating Therapy | | Step 1 | Step 2 | Step 3 and consider short course of oral systemic corticosteroids | |
| (See figure 4–1a for treatment steps.) | | In 2–6 weeks, depending on severity, evaluate level of asthma control that is achieved. If no clear benefit is observed in 4–6 weeks, consider adjusting therapy or alternative diagnoses. | | | |

Key: EIB, exercise-induced bronchospasm

Notes

- + The stepwise approach is meant to assist, not replace, the clinical decisionmaking required to meet individual patient needs.
- + Level of severity is determined by both impairment and risk. Assess impairment domain by patient's/caregiver's recall of previous 2–4 weeks. Symptom assessment for longer periods should reflect a global assessment such as inquiring whether the patient's asthma is better or worse since the last visit. Assign severity to the most severe category in which any feature occurs.
- + At present, there are inadequate data to correspond frequencies of exacerbations with different levels of asthma severity. For treatment purposes, patients who had ≥2 exacerbations requiring oral systemic corticosteroids in the past 6 months, or ≥4 wheezing episodes in the past year, and who have risk factors for persistent asthma may be considered the same as patients who have persistent asthma, even in the absence of impairment levels consistent with persistent asthma.

Source: *Guidelines for the Diagnosis and Management of Asthma*, National Asthma Education and Prevention Program, National Heart, Lung and Blood Institute, August 2007, page 307
Available at: <http://www.nhlbi.nih.gov/guidelines/asthma/index.htm>

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

| Components of Severity | | Classification of Asthma Severity (5–11 years of age) | | | |
|--|---|--|--|--|--|
| | | Intermittent | Persistent | | |
| | | | Mild | Moderate | Severe |
| Impairment | 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 times 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% |
| Risk | Exacerbations requiring oral systemic corticosteroids | 0–1/year (see note) | ≥2/year (see note) | | |
| | | Consider severity and interval since last exacerbation. Frequency and severity may fluctuate over time for patients in any severity category. | | | |
| | | Relative annual risk of exacerbations may be related to FEV ₁ . | | | |
| Recommended Step for Initiating Therapy (See figure 4–1b for treatment steps.) | | Step 1 | Step 2 | Step 3, medium-dose ICS option | Step 3, medium-dose ICS option, or step 4 |
| In 2–6 weeks, evaluate level of asthma control that is achieved, and adjust therapy accordingly. | | | | | |

Key: EIB, exercise-induced bronchospasm; FEV₁, forced expiratory volume in 1 second; FVC, forced vital capacity; ICS, inhaled corticosteroids

Notes

- + The stepwise approach is meant to assist, not replace, the clinical decisionmaking required to meet individual patient needs.
- + Level of severity is determined by both impairment and risk. Assess impairment domain by patient's/caregiver's recall of the previous 2–4 weeks and spirometry. Assign severity to the most severe category in which any feature occurs.
- + At present, there are inadequate data to correspond frequencies of exacerbations with different levels of asthma severity. In general, more frequent and intense exacerbations (e.g., requiring urgent, unscheduled care, hospitalization, or ICU admission) indicate greater underlying disease severity. For treatment purposes, patients who had ≥2 exacerbations requiring oral systemic corticosteroids in the past year may be considered the same as patients who have persistent asthma, even in the absence of impairment levels consistent with persistent asthma.

Source: *Guidelines for the Diagnosis and Management of Asthma*, National Asthma Education and Prevention Program, National Heart, Lung and Blood Institute, August 2007, page 311
Available at: <http://www.nhlbi.nih.gov/guidelines/asthma/index.htm>

ASSESSING ASTHMA CONTROL AND ADJUSTING THERAPY IN CHILDREN 0–4 YEARS OF AGE

| Components of Control | | Classification of Asthma Control (0–4 years of age) | | |
|---|---|--|--|--|
| | | Well Controlled | Not Well Controlled | Very Poorly Controlled |
| Impairment | Symptoms | ≤2 days/week | >2 days/week | Throughout the day |
| | Nighttime awakenings | ≤1x/month | >1x/month | >1x/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 |
| Risk | Exacerbations requiring oral systemic corticosteroids | 0–1/year | 2–3/year | >3/year |
| | 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 (See figure 4–1a for treatment steps.) | | <ul style="list-style-type: none"> • Maintain current treatment. • Regular followup every 1–6 months. • Consider step down if well controlled for at least 3 months. | <ul style="list-style-type: none"> • Step up (1 step) and Reevaluate in 2–6 weeks. • If no clear benefit in 4–6 weeks, consider alternative diagnoses or adjusting therapy. • For side effects, consider alternative treatment options. | <ul style="list-style-type: none"> • Consider short course of oral systemic corticosteroids, • Step up (1–2 steps), and • Reevaluate in 2 weeks. • If no clear benefit in 4–6 weeks, consider alternative diagnoses or adjusting therapy. • For side effects, consider alternative treatment options. |

Key: EIB, exercise-induced bronchospasm

Notes:

- + The stepwise approach is meant to assist, not replace, the clinical decisionmaking required to meet individual patient needs.
- + The level of control is based on the most severe impairment or risk category. Assess impairment domain by caregiver's recall of previous 2–4 weeks. Symptom assessment for longer periods should reflect a global assessment such as inquiring whether the patient's asthma is better or worse since the last visit.
- + At present, there are inadequate data to correspond frequencies of exacerbations with different levels of asthma control. In general, more frequent and intense exacerbations (e.g., requiring urgent, unscheduled care, hospitalization, or ICU admission) indicate poorer disease control. For treatment purposes, patients who had ≥2 exacerbations requiring oral systemic corticosteroids in the past year may be considered the same as patients who have not-well-controlled asthma, even in the absence of impairment levels consistent with not-well-controlled asthma.
- + Before step up in therapy:
 - Review adherence to medications, inhaler technique, and environmental control.
 - If alternative treatment option was used in a step, discontinue it and use preferred treatment for that step.

Source: *Guidelines for the Diagnosis and Management of Asthma*, National Asthma Education and Prevention Program, National Heart, Lung and Blood Institute, August 2007, page 309 Available at: <http://www.nhlbi.nih.gov/guidelines/asthma/index.htm>

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

| Components of Control | | Classification of Asthma Control (5–11 years of age) | | |
|---|---|--|--|--|
| | | Well Controlled | Not Well Controlled | Very Poorly Controlled |
| Impairment | Symptoms | ≤2 days/week but not more than once on 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 >80% | 60–80% predicted/ personal best 75–80% | <60% predicted/ personal best <75% |
| Risk | Exacerbations requiring oral systemic corticosteroids | 0–1/year | ≥2/year (see note) Consider severity and interval since last exacerbation | |
| | Reduction in lung growth | Evaluation requires long-term followup. | | |
| | 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 (See figure 4–1b for treatment steps.) | | <ul style="list-style-type: none"> • Maintain current step. • Regular followup every 1–6 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 oral systemic corticosteroids, • Step up 1–2 steps, and • Reevaluate in 2 weeks. • For side effects, consider alternative treatment options. |

Key: EIB, exercise-induced bronchospasm; FEV₁, forced expiratory volume in 1 second; FVC, forced vital capacity

Notes:

- + The stepwise approach is meant to assist, not replace, the clinical decisionmaking required to meet individual patient needs.
- + The level of control is based on the most severe impairment or risk category. Assess impairment domain by patient's/caregiver's recall of previous 2–4 weeks and by spirometry/or peak flow measures. Symptom assessment for longer periods should reflect a global assessment such as inquiring whether the patient's asthma is better or worse since the last visit.
- + At present, there are inadequate data to correspond frequencies of exacerbations with different levels of asthma control. In general, more frequent and intense exacerbations (e.g., requiring urgent, unscheduled care, hospitalization, or ICU admission) indicate poorer disease control. For treatment purposes, patients who had ≥2 exacerbations requiring oral systemic corticosteroids in the past year may be considered the same as patients who have persistent asthma, even in the absence of impairment levels consistent with persistent asthma.
- + Before step up in therapy:
 - Review adherence to medications, inhaler technique, environmental control, and comorbid conditions.
 - If alternative treatment option was used in a step, discontinue it and use preferred treatment for that step.

Source: *Guidelines for the Diagnosis and Management of Asthma*, National Asthma Education and Prevention Program, National Heart, Lung and Blood Institute, August 2007, page 310
Available at: <http://www.nhlbi.nih.gov/guidelines/asthma/index.htm>

ESTIMATED COMPARATIVE DAILY DOSAGES FOR INHALED CORTICOSTEROIDS IN CHILDREN

| Drug | Low Daily Dose | | Medium Daily Dose | | High Daily Dose | |
|--|----------------|---------------------------|--------------------|------------------------------|-----------------|----------------------|
| | Child 0–4 | Child 5–11 | Child 0–4 | Child 5–11 | Child 0–4 | Child 5–11 |
| Beclomethasone HFA 40 or 80 mcg/puff | NA | 80–160 mcg | NA | >160–320 mcg | NA | >320 mcg |
| Budesonide DPI 90, 180, or 200 mcg/inhalation | NA | 180–400 mcg | NA | >400–800 mcg | NA | >800 mcg |
| Budesonide inhaled Inhalation suspension for nebulization (child dose) | 0.25–0.5 mg | 0.5 mg | >0.5–1.0 mg | 1.0 mg | >1.0 mg | 2.0 mg |
| Flunisolide 250 mcg/puff | NA | 500–750 mcg | NA | 1,000–1,250 mcg | NA | >1,250 mcg |
| Flunisolide HFA 80 mcg/puff | NA | 160 mcg | NA | 320 mcg | NA | ≥640 mcg |
| Fluticasone HFA/MDI: 44, 110, or 220 mcg/puff DPI: 50, 100, or 250 mcg/inhalation | 176 mcg NA | 88–176 mcg 100–200 mcg | >176–352 mcg NA | >176–352 mcg >200–400 mcg | >352 mcg NA | >352 mcg >400 mcg |
| Mometasone DPI 200 mcg/inhalation | NA | NA | NA | NA | NA | NA |
| Triamcinolone acetonide 75 mcg/puff | NA | 300–600 mcg | NA | >600–900 mcg | NA | >900 mcg |

Key: HFA, hydrofluoroalkane; NA, not approved and no data available for this age group

Notes:

- + **The most important determinant of appropriate dosing is the clinician's judgment of the patient's response to therapy.** The clinician must monitor the patient's response on several clinical parameters and adjust the dose accordingly. The stepwise approach to therapy emphasizes that once control of asthma is achieved, the dose of medication should be carefully titrated to the minimum dose required to maintain control, thus reducing the potential for adverse effect.
- + Some doses may be outside package labeling, especially in the high-dose range. Budesonide nebulizer suspension is the only ICS with FDA approved labeling for children <4 years of age.
- + Metered-dose inhaler (MDI) dosages are expressed as the actuator dose (the amount of the drug leaving the actuator and delivered to the patient), which is the labeling required in the United States. This is different from the dosage expressed as the valve dose (the amount of drug leaving the valve, not all of which is available to the patient), which is used in many European countries and in some scientific literature. Dry powder inhaler (DPI) doses are expressed as the amount of drug in the inhaler following activation.
- + For children <4 years of age: The safety and efficacy of ICSs in children <1 year has not been established. Children <4 years of age generally require delivery of ICS (budesonide and fluticasone HFA) through a face mask that should fit snugly over nose and mouth and avoid nebulizing in the eyes. Wash face after each treatment to prevent local corticosteroid side effects. For budesonide, the dose may be administered 1–3 times daily. Budesonide suspension is compatible with albuterol, ipratropium, and levalbuterol nebulizer solutions in the same nebulizer. Use only jet nebulizers, as ultrasonic nebulizers are ineffective for suspensions.
- + For fluticasone HFA, the dose should be divided 2 times daily; the low dose for children <4 years is higher than for children 5–11 years of age due to lower dosedelivered with face mask and data on efficacy in young children.

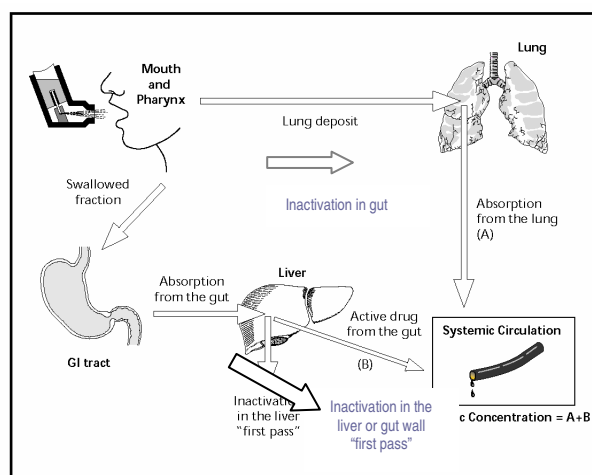
ESTIMATED COMPARATIVE DAILY DOSAGES FOR INHALED CORTICOSTEROIDS IN CHILDREN (CONTINUED)

- + Comparative dosages are based on published comparative clinical trials (Adams et al. 2005; Barnes et al. 1998; Kelly 1998; Lasserson et al. 2005; Pedersen and O'Byrne 1997). The rationale for some key comparisons is summarized as follows:
- The high dose is the dose that appears likely to be the threshold beyond which significant hypothalamic-pituitary-adrenal (HPA) axis suppression is produced, and, by extrapolation, the risk is increased for other clinically significant systemic effects if used for prolonged periods of time (Martin et al. 2002; Szeffler et al. 2002).
 - The low- to medium-doses reflect findings from dose-ranging studies in which incremental efficacy within the low- to medium dose ranges was established without increased systemic effect as measured by overnight cortisol excretion. The studies demonstrated a relatively flat dose-response curve for efficacy at the medium-dose range; that is, increasing the dose of high-dose range did not significantly increase efficacy but did increase systemic effect (Adams et al. 2001; Martin et al. 2002; Szeffler et al. 2002).
 - The dose for budesonide DPI is based on recently available comparative data with other medications. These new data, including meta-analyses, show that budesonide DPI is comparable to approximately twice the microgram dose of fluticasone MDI or DPI (Adams et al. 2005; Barnes et al. 1998; Nielsen and Dahl 2000).
 - The dose for beclomethasone in HFA inhaler should be approximately one-half the dose for beclomethasone chlorofluorocarbon (CFC) inhaler for adults and children, based on studies demonstrating that the different pharmaceutical properties of the medications result in enhanced lung delivery for the HFA (a less forceful spray from the HFA propellant and a reengineered nozzle that allows a smaller particle size) and clinical trials demonstrating similar potency to fluticasone at 1:1 dose ratio (Boulet et al. 2004; Busse et al. 1999; Gross et al. 1999; Lasserson et al. 2005; Leach et al. 1998; Pedersen et al. 2002; Szeffler et al. 2002; Thompson et al. 1998).
 - The dose for budesonide nebulizer suspension is based on efficacy and safety studies (Baker et al. 1999; Kemp et al. 1999; Shapiro et al. 1998). It is noted that the efficacy studies did not demonstrate a clear or consistent dose-response, although the high dose of 2.0 mg was effective in a placebo-controlled study in 40 infants who had severe asthma (de Blic et al. 1996). In a small, open-label, long-term safety study, the ACTH-stimulated cortisols appeared lower in the 13 infants receiving a high dose of 2.0 mg budesonide compared to infants receiving lower doses, but this result was not statistically significant, perhaps due to the small study size (Scott and Skoner 1999).
 - The dose for flunisolide HFA is based on product information and current literature (Corren et al. 2001; Gillman et al. 2002; Richards et al. 2001).
 - The dose of budesonide/formoterol in children is based on product information and current literature (Pohunek et al. 2006; Tal et al. 2002; Zimmerman et al. 2004).
 - The dose for fluticasone HFA in children <5 years of age is based on clinical studies demonstrating efficacy at this dose of 176 mcg/day (Bisgaard et al. 2004; Guilbert et al. 2006).

+ Bioavailability

Both the relative potency and the relative bioavailability (systemic availability) determine the potential for systemic activity of an ICS preparation. As illustrated here, the bioavailability of an ICS is dependent on the absorption of the dose delivered to the lungs and the oral bioavailability of the swallowed portion of the dose received.

- Absorption of the dose delivered to the lungs:
 - ◆ Approximately 10–50 percent of the dose from the MDI is delivered to the lungs. This amount varies among preparations and delivery devices.
 - ◆ Nearly all of the amount delivered to the lungs is bioavailable.



Adapted with permission from Barnes 1995.

ESTIMATED COMPARATIVE DAILY DOSAGES FOR INHALED CORTICOSTEROIDS IN CHILDREN (CONTINUED)

— Oral bioavailability of the swallowed portion of the dose received:

- ◆ Approximately 50–80 percent of the dose from the MDI without a spacer or valved holding chamber is swallowed.
- ◆ The oral bioavailability of this amount varies:

Either a high first-pass metabolism or the use of a spacer/holding chamber with an MDI can decrease oral bioavailability, thus enhancing safety (Lipworth 1995).

The approximate oral bioavailability of ICS has been reported as: beclomethasone dipropionate, 20 percent; flunisolide, 21 percent; triamcinolone acetonide, 10.6 percent; budesonide, 11 percent; fluticasone propionate, 1 percent; mometasone, <1 percent (Affrime et al. 2000; Chaplin et al. 1980; Check and Kaliner 1990; Clissold and Heel 1984; Davies 1993; Harding 1990; Heald et al. 1995; Martin et al. 1974; Mollmann et al. 1985; Szeffler 1991; Wurthwein and Rohdewald 1990).

Potential drug interactions

- + A number of the ICSs, including fluticasone, budesonide, and mometasone, are metabolized in the gastrointestinal tract and liver by CYP 3A4 isoenzymes. Potent inhibitors of CYP 3A4, such as ritonavir and ketoconazole, have the potential for increasing systemic concentrations of these ICSs by increasing oral availability and decreasing systemic clearance. Some cases of clinically significant Cushing syndrome and secondary adrenal insufficiency have been reported (Johnson et al. 2006; Samaras et al. 2005).

Source: *Guidelines for the Diagnosis and Management of Asthma*, National Asthma Education and Prevention Program, National Heart, Lung and Blood Institute, August 2007, page 314-316 Available at: <http://www.nhlbi.nih.gov/guidelines/asthma/index.htm>

USUAL DOSAGES FOR QUICK-RELIEF MEDICATIONS IN CHILDREN*

| Medication | Dosage Form | 0–4 Years | 5–11 Years | Comments |
|---|--|--|---|---|
| Inhaled Short-Acting Beta₂-Agonists | | | | |
| <i>MDI</i> | | | | |
| Albuterol CFC | 90 mcg/puff, 200 puffs/canister | 1–2 puffs 5 minutes before exercise | 2 puffs 5 minutes before exercise | + Differences in potencies exist, but all products are essentially comparable on a per puff basis. |
| Albuterol HFA | 90 mcg/puff, 200 puffs/canister | 2 puffs every 4– 6 hours as needed | 2 puffs every 4– 6 hours as needed | + An increasing use or lack of expected effect indicates diminished control of asthma. + Not recommended for long-term daily treatment. Regular use exceeding 2 days/week for symptom control (not prevention of EIB) indicates the need for additional long-term control therapy. + May double usual dose for mild exacerbations. |
| Levalbuterol HFA | 45 mcg/puff, 200 puffs/canister | Safety and efficacy not established in children <4 years | 2 puffs every 4–6 hours as needed | + Should prime the inhaler by releasing 4 actuations prior to use. + Periodically clean HFA actuator, as drug may plug orifice. |
| Pirbuterol CFC Autohaler | 200 mcg/puff, 400 puffs/canister | Safety and efficacy not established | Safety and efficacy not established | + Children <4 years may not generate sufficient inspiratory flow to activate an auto-inhaler. + Nonselective agents (i.e., epinephrine, isoproterenol, metaproterenol) are not recommended due to their potential for excessive cardiac stimulation, especially in high doses. |
| <i>Nebulizer solution</i> | | | | |
| Albuterol | 0.63 mg/3 mL 1.25 mg/3 mL 2.5 mg/3 mL 5 mg/mL (0.5%) | 0.63–2.5 mg in 3 cc of saline q 4–6 hours, as needed | 1.25–5 mg in 3 cc of saline q 4–8 hours, as needed | + May mix with cromolyn solution, budesonide inhalant suspension, or ipratropium solution for nebulization. May double dose for severe exacerbations. |
| Levalbuterol (R-albuterol) | 0.31 mg/3 mL 0.63 mg/3 mL 1.25 mg/0.5 mL 1.25 mg/3 mL | 0.31–1.25 mg in 3 cc q 4–6 hours, as needed | 0.31–0.63 mg, q 8 hours, as needed | + Does not have FDA-approved labeling for children <6 years of age. + The product is a sterile-filled preservative-free unit dose vial. + Compatible with budesonide inhalant suspension. |

Source: *Guidelines for the Diagnosis and Management of Asthma*, National Asthma Education and Prevention Program, National Heart, Lung and Blood Institute, August 2007, page 318 Available at: <http://www.nhlbi.nih.gov/guidelines/asthma/index.htm>

Sample Action Plans



SAMPLE LONG TERM TREATMENT PLAN FOR INTERMITTENT ASTHMA

| CLINICAL CONDITION | Baseline Plan & When asthma is under control* | At the FIRST sign of a cold or mild asthma attack | For rapidly worsening asthma (severe attack) | For cough or wheeze with exercise |
|--|--|--|--|--------------------------------------|
| MEDICATION <i>Reliever:</i> Inhaled short-acting beta ₂ -agonist | 2 puffs as needed | 2 puffs every 4 hr | 2-6 puffs every 20 minutes for 3 doses then 2-4 puffs every 4 hr | 2 puffs 5-10 minutes before exercise |
| Corticosteroid Tablet or Syrup | 0 | 0 | Begin with 1-2 mg/kg/day NOTIFY MD | |

* In some cases lung function values may be available. These would correspond to % predicted FEV₁/FVC as follows: control = above 80%; cold or mild attack = 75 to 80%; worsening symptoms = below 75%

SAMPLE LONG TERM TREATMENT PLAN

FOR MILD PERSISTENT ASTHMA

| CLINICAL CONDITION | Baseline Plan & When asthma is under control* | At the FIRST sign of a cold or mild asthma attack | For rapidly worsening asthma (severe attack) | When there is no cough or wheeze for 3 months | For cough or wheeze with exercise |
|--|---|--|--|---|--|
| MEDICATION <i>Reliever:</i> Inhaled short-acting beta ₂ -agonist | 2 puffs as needed | 2 puffs every 4 hr | 2-6 puffs every 20 minutes for 3 doses then 2-4 puffs every 4 hr | 2 puffs as needed | 2 puffs 5-10 minutes before exercise |
| <i>Controller:</i> 1) Inhaled low dose corticosteroid | 1-4 puffs 2x/day | 1-4 puffs 2x/day | 1-4 puffs 2x/day | 1puff 1x/day** | |
| Corticosteroid Tablet or Syrup | 0 | 0 | Begin with 1-2 mg/kg/day NOTIFY MD | 0 | |

* In some cases lung function values may be available. These would correspond to % predicted FEV₁/FVC as follows: control = above 80%; cold or mild attack = 75 to 80%; worsening symptoms = below 75%; no symptoms for 3 months = over 80% for 3 months

** If patient develops symptoms when corticosteroid is reduced to 1 puff/day, either increase corticosteroid to 2 puffs/day or try 1 tablet/day of leukotriene modifier

SAMPLE LONG TERM TREATMENT PLAN FOR MODERATE PERSISTENT ASTHMA

| CLINICAL CONDITION | Baseline Plan & When asthma is under control* | At the FIRST sign of a cold or mild asthma attack | For rapidly worsening asthma (severe attack) | When there is no cough or wheeze for 3 months | For cough or wheeze with exercise |
|---|---|--|--|---|--|
| MEDICATION <i>Reliever.</i> Inhaled short-acting beta ₂ -agonist | 0 | 2 puffs every 4 hr | 2-6 puffs every 20 minutes for 3 doses then 2-4 puffs every 4 hr | 0 | 2 puffs 5-10 minutes before exercise |
| <i>Controller.</i> 1) Inhaled medium dose corticosteroid <i>and</i> 2) Long-acting beta ₂ -agonist <i>and</i> 3) Leukotriene modifier | 2-4 puffs 2x/day | 2-4 puffs 2x/day | 2-4 puffs 2x/day | 1 puff 2x/day** | |
| Corticosteroid Tablet or Syrup | 0 | 0 | Begin with 1-2 mg/kg/day NOTIFY MD | 0 | |

* In some cases lung function values may be available. These would correspond to % predicted FEV₁/FVC as follows: control = above 80%; cold or mild attack = 75 to 80%; worsening symptoms = below 75%

**If patient develops symptoms when inhaled steroid is reduced to 1 puff 2x/day, increase the corticosteroid to 2 puffs 2x/day

SAMPLE LONG TERM TREATMENT PLAN FOR SEVERE PERSISTENT ASTHMA

| CLINICAL CONDITION | Baseline Plan and When asthma is under control* | For rapidly worsening asthma (severe attack) | When there is no cough or wheeze for 3 months | For cough or wheeze with exercise |
|--|---|--|---|--------------------------------------|
| MEDICATION <i>Reliever:</i> Inhaled short-acting beta ₂ -agonist | 2-4 puffs as needed | 2-6 puffs every 20 minutes for 3 doses then 2-4 puffs every 4 hr | 2-4 puffs as needed | 2 puffs 5-10 minutes before exercise |
| <i>Controller:</i> 1) Inhaled high dose corticosteroid <i>and</i> 2) Long-acting beta ₂ -agonist | 4-5 puffs 2x/day | 4-5 puffs 2x/day | 2-4 puffs 2x/day | |
| | 1 inhalation 2x/day | 1 inhalation 2x/day | 1 inhalation 2x/day | |
| Corticosteroid Tablet or Syrup | 0.25-2 mg/kg/day** | 2 mg/kg/day NOTIFY MD | 0 | |

* In some cases lung function values may be available. These would correspond to % predicted FEV₁/FVC as follows: control = above 80%; worsening symptoms = below 75%; no cough or wheeze for 3 months = above 80% for 3 months

** If not controlled with controllers (1), (2) and (3), add systemic corticosteroid

SAMPLE ASTHMA ACTION PLAN

Child Asthma Action Plan

0–5 years of age

Patient Name: _____

Medical Record #: _____

Health Care Provider's Name: _____ DOB: _____

Health Care Provider's Phone #: _____ Completed by: _____ Date: _____

| Long-Term-Control Medicines (Use Every Day To Stay Healthy) | How Much To Take | How Often | Other Instructions (such as spacers/masks, nebulizers) |
|--|------------------|--|--|
| | | _____ times per day EVERY DAY! | |
| | | _____ times per day EVERY DAY! | |
| | | _____ times per day EVERY DAY! | |
| | | _____ times per day EVERY DAY! | |
| Quick-Relief Medicines | How Much To Take | How Often | Other Instructions |
| | | Give ONLY as needed | NOTE: If this medicine is needed often (_____ times per week), call physician. |

GREEN ZONE

Child is well and has no asthma symptoms, even during active play.



PREVENT asthma symptoms every day:

- Give the above long-term-control medicines every day.
- Avoid things that make the child's asthma worse:
 - Avoid tobacco smoke; ask people to smoke outside.
 - _____
 - _____

YELLOW ZONE

Child is not well and has asthma symptoms that may include:

- Coughing
- Wheezing
- Runny nose or other cold symptoms
- Breathing harder or faster
- Awakening due to coughing or difficulty breathing
- Playing less than usual

- _____
- _____

Other symptoms that could indicate that your child is having trouble breathing may include: difficulty feeding (grunting sounds, poor sucking), changes in sleep patterns, cranky and tired, decreased appetite.

CAUTION. Take action by continuing to give regular asthma medicines every day AND:

- Give _____
(include dose and frequency)

If the child is not in the **Green Zone** and still has symptoms after 1 hour, then:

- Give more _____
(include dose and frequency)
- _____
(include dose and frequency)
- Call _____
(include dose and frequency)

RED ZONE

Child feels awful! Warning signs may include:

- Child's wheeze, cough, or difficulty breathing continues or worsens, even after giving yellow zone medicines.
- Child's breathing is so hard that he/she is having trouble walking/talking/eating/playing.
- Child is drowsy or less alert than normal.

MEDICAL ALERT! Get help!

- Take the child to the hospital or call 9–1–1 immediately!
- Give more _____ until you get help.
(include dose and frequency)
- Give _____
(include dose and frequency)

Call 9–1–1 if:

- The child's skin is sucked in around neck and ribs, or
- Lips and/or fingernails are grey or blue, or
- Child doesn't respond to you.

Danger! Get help immediately!

Adapted and reprinted in the Expert Panel Report 3: Guidelines for the Diagnosis and Management of Asthma (August 2007) with permission from the Regional Asthma Management and Prevention (RAMP) Initiative, a program of the Public Health Institute.

Source: <http://www.calasthma.org/uploads/resources/actionplanpdf.pdf>; San Francisco Bay Area Regional Asthma Management Plan, <http://www.rampasthma.org>

SAMPLE ASTHMA ACTION PLAN

Child Asthma Action Plan 0-5 years of age

Patient Name: Aiden Smith

Medical Record #: 945708

Health Care Provider's Name: Dr. Exemplar

DOB: 9/1/04

Health Care Provider's Phone #: 555-1212

Completed by: SES

Date: 10/11/07

| Long-Term-Control Medicines (Use Every Day To Stay Healthy) | How Much To Take | How Often | Other Instructions (such as spacers/masks, nebulizers) |
|--|------------------|-------------------------------|--|
| Flovent 44 mcg | 2 puffs | 2 times per day EVERY DAY! | use spacer, rinse mouth |
| Claritin | 10 mg | 1 times per day EVERY DAY! | |
| | | — times per day EVERY DAY! | |
| | | — times per day EVERY DAY! | |
| Quick-Relief Medicines | How Much To Take | How Often | Other Instructions |
| ProAir (use spacer) | 2 puffs | Give ONLY as needed | NOTE: If this medicine is needed often (2 times per week), call physician. <u>not including pre-treatment</u> |

GREEN ZONE

Child is well
and has no asthma symptoms, even during active play.



PREVENT asthma symptoms every day:

- Give the above long-term-control medicines every day.
- Avoid things that make the child's asthma worse:

Avoid tobacco smoke; ask people to smoke outside.

YELLOW ZONE

Child is not well and has asthma symptoms that may include:

- Coughing
- Wheezing
- Runny nose or other cold symptoms
- Breathing harder or faster
- Awakening due to coughing or difficulty breathing
- Playing less than usual

• _____

• _____

Other symptoms that could indicate that your child is having trouble breathing may include: difficulty feeding (grunting sounds, poor sucking), changes in sleep patterns, cranky and tired, decreased appetite.

CAUTION. Take action by continuing to give regular asthma medicines every day AND:

Give ProAir, 2 puffs

(include dose and frequency)

If the child is not in the **Green Zone** and still has symptoms after 1 hour, then:

Give more ProAir, 2 puffs or 1 vial
by nebulization if available

(include dose and frequency)

Call Dr. Exemplar

(include dose and frequency)

RED ZONE

Child feels awful! Warning signs may include:

- Child's wheeze, cough, or difficulty breathing continues or worsens, even after giving yellow zone medicines.
- Child's breathing is so hard that he/she is having trouble walking/talking/eating/playing.
- Child is drowsy or less alert than normal.

MEDICAL ALERT! Get help!

Take the child to the hospital or call 9-1-1 immediately!

Give more ProAir, 2 puffs
until you get help.

(include dose and frequency)

Give oral steroids as directed by Dr.

(include dose and frequency)

Danger! Get help immediately!

- Call 9-1-1 if:
- The child's skin is sucked in around neck and ribs, or
- Lips and/or fingernails are grey or blue, or
- Child doesn't respond to you.

Adapted and reprinted in the Expert Panel Report 3: Guidelines for the Diagnosis and Management of Asthma (August 2007) with permission from the Regional Asthma Management and Prevention (RAMP) Initiative, a program of the Public Health Institute.

Source: <http://www.calasthma.org/uploads/resources/actionplanpdf.pdf>; San Francisco Bay Area Regional Asthma Management Plan, <http://www.rampasthma.org>

Communication



COMMUNICATION STRATEGIES

1. Nonverbal attentiveness

Sit at the same level as patient and family.
Avoid having a barrier, such as a desk, between you.
Make eye contact when listening and speaking.
Lean forward slightly.

2. Eliciting underlying fears

Ask open-ended questions such as:
"What is your greatest worry about asthma?"
"What concerns do you have about the medicine?"
"What things would you like to do that your asthma makes it hard to do?"

3. Addressing immediate concerns

Patient or family concerns should be addressed right away, even if a complete answer isn't possible at the time. The purpose is to reassure the family by being responsive to the issues that matter to them.

4. Reassuring messages

Unrealistic fears (of medicines or possible fatality) can block compliance. By conveying accurate information about risks and stressing that following your recommendations will increase the child's safety, the family will be reassured and more likely to follow your advice.

5. Interactive conversation

Ask open-ended questions that can't be answered "yes" or "no" to encourage the family to convey information about beliefs, concerns, and how they manage asthma at home.
Use simple, clear language and avoid medical jargon.
Use analogies to ensure that the family grasps new ideas.

6. Tailoring the regimen

Assess daily routines of the family to learn the best times and places for giving medicines during the day.
Reach agreement with the family on a daily plan for taking the medicine, making sure they are willing and able to follow it.

7. Planning for decision-making

Help the family plan for decision-making by encouraging them to keep a diary and/or develop strategies for handling potential problems or choices that may occur, such as emergencies at school or participation in sports at school or summer camp.
Reviewing the written treatment plan with the family helps them know how to decide when medicines should be adjusted to control symptoms, and when the child needs immediate medical attention.

8. Setting short-term goals for treatment

Should be decided with the family, and tied to the patient's own goals to increase motivation to follow the treatment plan. Provides a benchmark for the family to judge progress.

9. Setting goals with the long-term treatment plan

Having a long-term treatment plan helps the family know what to expect and what they may be able to achieve through preventive care.

10. Nonverbal encouragement and verbal praise

Reinforce positive steps the family has taken to control asthma. Use these strategies to increase their confidence that they can manage asthma successfully following your plan.

KEY ASTHMA MESSAGES FOR THE PATIENT AND FAMILY

1. What happens in an asthma attack

In an asthma attack you have trouble breathing because:

- the airway lining swells and produces too much mucus (inflammation)
- the muscles around the airways squeeze them partly shut (bronchospasm)

2. How medicines work

Anti-inflammatories don't give an immediate feeling of relief, but are crucial to reducing inflammation and preventing its return. Bronchodilators relax the muscles that have tightened around the airways.

Call me if either of the following happen, because it means the medicines need to be adjusted:

- If bronchodilators are needed more than 4 times a day, we need to increase the amount of anti-inflammatory medicine.
- If there is jitteriness or anxiety, we will need to reduce the amount of bronchodilator.

3. Responding to changes in asthma severity

When symptoms change, use the long term plan to adjust the medicines.

If symptoms worsen rapidly, follow the emergency plan I've given you.

Come immediately for treatment to my office or the hospital if any of the following happens:

- No improvement after following the emergency plan
- So breathless you can't talk or walk
- Blue fingernails or lips

4. How to take medicines

Demonstrate for me how to use the metered dose inhaler and spacer.

Show me how to use the peak flow meter.

Use the step by step instructions at home.

5. Safety of medicines

The medicines I've prescribed are safe when used in the doses I've recommended.

Low doses of inhaled corticosteroids are safe and do not cause serious side effects.

Corticosteroids are not the same as the muscle-building steroids some athletes use.

6. Goals of therapy

Your child should be symptom free.

This control should be achieved with as little medicine as possible. The long-term plan can get us to the point of decreasing or stopping the medicines.

Some people with asthma have been sports champions and Olympic gold medalists.

7. Criteria of successful treatment

Your child should sleep through the night, have no wheeze or cough even during exercise or colds, and be fully active.

If you continue to have symptoms, call me and we'll fine tune the plan.

If your child has asthma symptoms more than once every two months, daily medicines will be needed until there are no symptoms for 3 or 4 months even during exercise or colds.

8. Managing asthma at school

Key school personnel need to be informed about the child's asthma.

Important points to inform the school about are:

- How to minimize exposure to triggers
- When to use medicine at school
- Encouraging participation in physical activities
- What to do in an emergency

Only keep your child home if the wheezing is bad or she has a fever or sore throat.

9. Identifying and avoiding triggers

Sometimes triggers to symptoms can be identified, so see if you can discover what yours are.

Triggers may include respiratory infections, allergens (dust, roach, and animal dander), irritants (smoke), and exercise.

Use bronchodilator and cromolyn preventively when you may be exposed to a trigger.

10. Referral to further education and review of goals

Take part in a comprehensive asthma self-management program.

Remember our goal for your child is to be symptom free and fully active.

REFERENCES

Clark NM, Gong M, Schork MA, Evans D, Roloff D, Hurwitz M, Maiman L, Mellins RB. Impact of education for physicians on patient outcomes. *Pediatrics* 1998;101:831-36.

Clark NM, Gong M, Schork MA, Kaciroti N, Evans D, Roloff D, Hurwitz M, Maiman LA, Mellins RB. Long-term effects of asthma education for physicians on patient satisfaction and use of health services. *Eur Respir J* 2000;16:15-21.

Physician's Record: Categories of Asthma Messages Provided

Patients Name _____

Check if topic covered

VISIT ONE

- What happens to the airways in an asthma attack

- How medicines work (rescue/control)

- Responding at home to changes in asthma severity (long-term plan and emergency plan)

- How to take medicines (child/parent demonstrate)

VISIT TWO

- Safety of medicines when used as directed

- Goals of therapy (no symptoms with as little medicine as necessary)

- Criteria of successful treatment (sleep through the night, no asthma symptoms even with exercise or colds)

VISIT THREE

- Managing asthma at school

- Identifying triggers

- Referral to additional asthma education

- Review of goals of therapy

Physician's Self-Rating Scale On Interactions with the Family

Patient's Name: _____

Date: _____

PHYSICIAN GOALS FOR THE INTERACTION:

- Have parent and child specify his/her concerns and get questions onto the table
- Reach agreement on being partners
- Ensure that in achieving a short-term treatment goal parents see the necessity of a long-term treatment plan
- Agree on the steps of self-management at home

*Rate your behavior in the interaction with the family:
1=low rating, 5=high rating*

WERE YOU ABLE TO:

- | | |
|---|--|
| <p>1. Use appropriate non-verbal attentiveness (e.g. eye contact, closing social distance, etc)? 1 2 3 4 5</p> <p>2. Elicit the parents' and child's underlying concern about the child's asthma? 1 2 3 4 5</p> <p>3. Construct reassuring messages regarding the parents' and child's fears? 1 2 3 4 5</p> <p>4. Address immediately the concerns the family expressed? 1 2 3 4 5</p> <p>5. Engage the family in interactive conversation (e.g. used open-ended questions, simple language, analogies, etc.)? 1 2 3 4 5</p> <p>6. Tailor the regimen by eliciting and addressing potential problems in the timing, dosage, or side-effects of the medicines recommended? 1 2 3 4 5</p> | <p>7. Use appropriate non-verbal encouragement and verbal praise when the family reported using correct management strategies? 1 2 3 4 5</p> <p>8. Elicit the family's immediate objective related to asthma control and agree on a short-term goal? 1 2 3 4 5</p> <p>9. Review the long-term plan? 1 2 3 4 5</p> <p>10. Help the family plan for decision-making by encouraging them to keep a diary and/or develop strategies for handling potential problems (e.g. emergencies, participation at school, sports)? 1 2 3 4 5</p> |
|---|--|

REVIEW OF CONCEPTS

| Message | What the Message Addresses |
|--|---|
| <ul style="list-style-type: none"> • Airway lining swells and mucous forms • Muscles tighten around airways | <ul style="list-style-type: none"> • Asthma severity (bad news) |
| <ul style="list-style-type: none"> • Anti-inflammatories reduce inflammation • Bronchodilators relax muscles | <ul style="list-style-type: none"> • Benefits of medicine (good news) |
| <ul style="list-style-type: none"> • Bronchodilators not to be used more than four times per day • Watch for jitteriness and anxiety | <ul style="list-style-type: none"> • Side effects can be limited |
| <ul style="list-style-type: none"> • Follow the long-term plan • Follow the treatment plan | <ul style="list-style-type: none"> • Shows that medicines are adjusted according to the level of control a patient can achieve • Shows how benefits of using medicines can outweigh costs |
| <ul style="list-style-type: none"> • Demonstrate use of medicines • Use written instructions | <ul style="list-style-type: none"> • Builds self confidence and level of skills |
| <ul style="list-style-type: none"> • Need daily anti-inflammatories | <ul style="list-style-type: none"> • Reducing susceptibility to asthma episodes |
| <ul style="list-style-type: none"> • Long-term goal to control asthma with as little medicine as necessary | <ul style="list-style-type: none"> • Shows how benefits of following regimen over time outweigh costs |
| <ul style="list-style-type: none"> • Medicines safe when used as instructed • Inhaled steroids safe in low doses • Corticosteroids differ from anabolic | <ul style="list-style-type: none"> • Builds confidence in the regimen • Reduces fear associated with use of medicine |
| <ul style="list-style-type: none"> • Expect to exercise without symptoms • Expect to sleep through the night | <ul style="list-style-type: none"> • Shows benefits of therapy |
| <ul style="list-style-type: none"> • Plan can be fine-tuned if problems arise | <ul style="list-style-type: none"> • Shows that ongoing partnership with clinician is needed |
| <ul style="list-style-type: none"> • Be physically active • Sports champs have asthma in control | <ul style="list-style-type: none"> • Shows benefits of therapy • Builds self-confidence |
| <ul style="list-style-type: none"> • School personnel need to be informed about triggers, medications, physical exercise, emergencies | <ul style="list-style-type: none"> • Need for support in the social environment |
| <ul style="list-style-type: none"> • Triggers can be identified | <ul style="list-style-type: none"> • Increases feelings of control • Reduces susceptibility to episodes |
| <ul style="list-style-type: none"> • Use medicines preventively when your child may be exposed to triggers | <ul style="list-style-type: none"> • Shows benefits of therapy • Increases feeling of control |
| <ul style="list-style-type: none"> • The goal is to be symptom-free | <ul style="list-style-type: none"> • Shows benefits of staying with therapy |
| <ul style="list-style-type: none"> • Take part in additional asthma education | <ul style="list-style-type: none"> • Builds self-confidence |

Case Studies



Case Presentation #1

During an office visit with a new patient, Mrs. Wallace tells you that every time her two-year-old daughter Jennifer has a cold, she has severe coughing and wheezing that lasts for two or three weeks. She had four such colds in the last year; the most recent occurred a month ago. Jennifer does not have any symptoms now, but Mrs. Wallace is worried and asks you for help.

- What treatment plan would you recommend to Mrs. Wallace for Jennifer's asthma?
- What do you think would be the greatest challenge in getting Mrs. Wallace to follow the treatment plan?

Case Presentation #2

Tom Platt is six years old and coughs and wheezes several times a week. The symptoms occur when he runs or is near a cat, but are mild and usually subside within an hour. The Platt family does not have any pets in their home. Mrs. Platt has never had to take Tom to the emergency room, but she tries to keep him from running too much to prevent these symptoms.

- What treatment plan would you recommend to Mrs. Platt for Tom's asthma?
- What do you think would be the greatest challenge in getting Mrs. Platt to follow the treatment plan?

Case Presentation #3

Angela Mendez is 10 months old, and has repeated episodes of wheezing and difficulty breathing. When you prescribed albuterol syrup, her symptoms got better, but she was fussy, couldn't sleep, and vomited. Mrs. Mendez is getting frustrated. You have already completed an extensive work up and have ruled out other causes for the breathing difficulties.

- What treatment plan would you recommend to Mrs. Mendez for Angela's asthma?
- What do you think would be the greatest challenge in getting Mrs. Mendez to follow the treatment plan?

Case Study 1

A 3 year-old boy is brought by his mother for evaluation of worsening asthma symptoms.

He was diagnosed with asthma several months ago by your partner. The patient has been using an inhaled short-acting bronchodilator (β_2 -agonist) as needed for symptoms of wheezing and shortness of breath. The patient and his mother now report that he has daytime symptoms approximately 3 times per week but no nighttime symptoms.

What level of control does this patient have?

Case Study 2

A 19 year-old college student comes in for a routine follow-up visit for asthma.

She was diagnosed when she was 8 years old. She “feels fine” and is not bothered by her asthma. On further questioning, you learn that she is doing poorly in her first class of the day because she has difficulty waking up in time to attend lecture. She states that sometimes this results from staying up late to talk with friends, but at other times she “tosses and turns all night coughing.” She thinks that she is having trouble sleeping twice a week.

What level of control does this patient have?

Case Study 3

A 6 year-old boy with a history of asthma comes to your office for the first time in August for a school physical exam.

He has no asthma symptoms now, but his mom states that usually “around the change of seasons” he starts wheezing and coughing often. The symptoms occur everyday, but only during the day.

What severity of asthma illness does this patient have?

Documentation and Coding



ASTHMA CODING AT A GLANCE

Coding of asthma requires a number of codes to properly get reimbursed. Coding of the level of care can be done two different ways:

- a. using the 3 key factors of history, physical and medical decision making
 - a. **99201 – 99205: new patient visits**
 - b. **99212 – 99215: established patient visits**
- b. Using time as a key factor (where counseling and coordination of care is greater than 50% of the visit).
 - i. **99212 – 10 min need > 5 min**
 - ii. **99213 – 15 min need > 7.5 min**
 - iii. **99214 – 25 min need > 12.5 min**
 - iv. **99215 – 40 min need > 20 min**

When a patient presents for an asthma visit and there is a lengthy discussion, the physician needs to consider the amount of time spent in that discussion.

EXAMPLE: The patient returns for a revisit of a previously diagnosed acute exacerbation of asthma, on an inhaler and nebulizer treatments but is now clear. History and exam is problem focused justifying a 99212 level of care. Claim appears like this:

| | | |
|----------|-------|---------|
| 1-1-2007 | 99212 | \$50.00 |
|----------|-------|---------|

However, discussion concerning an asthma action plan was documented along with the amount of time with this statement, 'The asthma action plan was discussed. Total amount of time in visit 15 min. of which > 15 min. was spent in counseling.' This visit is now a 99214 using time as the key factor. Claim now appears like this:

| | | |
|----------|-------|---------|
| 1-1-2007 | 99214 | \$75.00 |
|----------|-------|---------|

One other vital code that needs to be considered: **Prolonged Care 99354-99355**

When a visit goes beyond the usual amount of time assessed to the level of care by 30 to 74 min., a prolonged care code can then also be claimed.

EXAMPLE: Patient is present in office for 2 hours of which the physician sees the patient for 60 min total face to face time. Documentation justifies a 99214 (25 min). With the additional time of 35 min due to reevaluations etc. the 99354 code can be claimed as well. Claim now appears like this:

| | | |
|----------|-----------------------|----------|
| 1-1-2007 | 99214-25 office visit | \$75.00 |
| 1-1-2007 | 99354 prolonged care | \$150.00 |

Procedures performed during treatment of asthma:

- a. **94640 Nebulizer treatment**
- b. **94664 Teaching on Nebulizer or Inhaler to patient/family**
- c. **94760 Pulse Oximetry**
- d. **94761 Multiple determinations of Pulse Oximetry**

Patient as above with two nebulizer treatments and one pulse oximetry, claim now appears like this:

| | | |
|----------|---------------------------|----------------------------|
| 1-1-2007 | 99214-25 office visit | \$75.00 |
| 1-1-2007 | 99354 prolonged care | \$150.00 |
| 1-1-2007 | 94640 nebulizer treatment | \$55.00 |
| 1-1-2007 | 94640- 76 nebulizer trt | \$55.00 (second nebulizer) |
| 1-1-2007 | 94760- 59 pulse oximetry | \$20.00 |

Modifiers needed:

- a. **25 modifier: used with office visit to indicate separate and distinct visit to determine need for procedure**
- b. **76 modifier: used on a procedure that has been performed earlier by same physician to indicate that it is a multiple procedure.**
- c. **59 modifier: used on a procedure to indicate that the procedure is not a bundled service and is distinct and separately payable**

Height _____
 Weight _____
 B/P _____
 Reason for visit _____
 Temp _____ Meds _____

(EST. PT.)

| HPI (1= 0 elements) (2 = 1-3 elements) (3 = 1-3 elements) (4 = 4 or more elements) (5 = 4 or more elements) | | | | | | | |
|--|---------|----------|----------|--------|---------|-------------------|-----------------------------|
| Location | Quality | Severity | Duration | Timing | Context | Modifying Factors | Associated Signs & Symptoms |
| | | | | | | | |
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| ROS (1= none) (2 = none) (3 = 1 pertinent system) (4 = 2-9 systems) (5 = 10 or more or some w/statement "all others negative") | | | | | | | |
|--|----------------|-----------------|-----------|-------------|-------------------------|-----------------------|--|
| Constitutional | Cardiovascular | Musculoskeletal | Endocrine | Respiratory | Hematologic/lymphatic | | |
| Eyes | ENT & mouth | Integumentary | G.I. | G.U. | Allergies/immunological | "all others negative" | |
| | | | | | | | |
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| PFSH (1= none) (2 = none) (3 = none) (4 = 1 pertinent area) (5 = only 2 areas required for an established patient) | | | | | | | |
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| PHYSICAL EXAM (1=none) (2 = one area) (3 = 2-7 areas) (4= 6-7 det.) (5= 8 or more) Blank = Defer ABNORMAL NOTES | | ASSESSMENT & PLAN (1 = Straightforward) (2 = Straightforward) (3 = Low Complexity) (4 = Moderate Complexity) (5 = High Complexity) | | | | | | |
|--|--|--|---|---|---|---|---|--|
| General | | | | | | | | |
| Eyes | | | | | | | | |
| Ears | | | | | | | | |
| Nose | | | | | | | | |
| Mouth/Pharynx | | | | | | | | |
| Head/Face | | | | | | | | |
| Skin | | | | | | | | |
| Neck | | | | | | | | |
| Nodes | | | | | | | | |
| Breasts | | | | | | | | |
| Heart | | | | | | | | |
| Lungs | | | | | | | | |
| Abdomen | | | | | | | | |
| Genitals | | | | | | | | |
| Ano-Rect | | | | | | | | |
| Extremities | | | | | | | | |
| Spine | | | | | | | | |
| CNS | | | | | | | | |
| | | EST. PT. | 1 | 2 | 3 | 4 | 5 | |
| | | HISTORY | | | | | | |
| | | P. EXAM | | | | | | |
| | | MDM | | | | | | |

| Counseling time & Coord. of Care | EST. Patient (1 = 5 min) (2 = 10 min) (3 = 15 min) (4 = 25 min) (5 = 40 min) **only 1/2 of time listed above need be couns/coc*but, total time must be documented |
|----------------------------------|---|
| | |

DATE: _____ ATTENDING: _____ RESIDENT: _____
 DATE DICTATED: _____

Height _____
 Weight _____
 B/P _____
 Reason for visit _____
 Temp _____ Meds _____

(NEW PT.)

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|--|----------------|---|---|---|-------------------------|-----------------------|-----------------------------|----------|--|----------------|----------|----------|----------|----------|----------|--|----------------|--|--|--|--|--|--|----------------|--|--|--|--|--|--|------------|--|--|--|--|--|
| HPI (1 = 1-3 elements) (2 = 1-3 elements) (3 = 4 or more elements) (4 & 5 = 4 or more elements) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Location | Quality | Severity | Duration | Timing | Context | Modifying Factors | Associated Signs & Symptoms | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| ROS (1 = none) (2 = 1 pertinent system) (3 = 2-9 systems) (4 & 5 = 10 or more or some w/statement "all others negative") | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Constitutional | Cardiovascular | Musculoskeletal | Endocrine | Respiratory | Hematologic/lymphatic | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Eyes | ENT & mouth | Integumentary | G.I. | G.U. | Allergies/immunological | "all others negative" | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| PFSH (1 = none) (2 = none) (3 = 1 pertinent area) (4 & 5 = all 3 history areas required for a new patient) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| PHYSICAL EXAM (1= one area) (2= 2-7) (3 = 6-7 det.) (4 & 5 = 8 or more) Blank = Defer ABNORMAL NOTES | | | | ASSESSMENT & PLAN (1 = Straightforward) (2 = Straightforward) (3 = Low Complexity) (4 = Moderate Complexity) (5 = High Complexity) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| General | ABNORMAL NOTES | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Eyes | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Ears | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Nose | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Mouth Pharynx | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Head/Face | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Skin | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Neck | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Nodes | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Breasts | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Heart | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Lungs | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Abdomen | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Genitals | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Ano-Rect | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Extremities | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Spine | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| CNS | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | Counseling time & Coord. of Care | <table border="1" style="width:100%; border-collapse: collapse; text-align: center;"> <tr style="background-color: #e0e0e0;"> <td style="width:10%;"></td> <td style="width:10%;">NEW PT.</td> <td style="width:10%;">1</td> <td style="width:10%;">2</td> <td style="width:10%;">3</td> <td style="width:10%;">4</td> <td style="width:10%;">5</td> </tr> <tr> <td></td> <td>HISTORY</td> <td> </td><td> </td><td> </td><td> </td><td> </td> </tr> <tr> <td></td> <td>P. EXAM</td> <td> </td><td> </td><td> </td><td> </td><td> </td> </tr> <tr> <td></td> <td>MDM</td> <td> </td><td> </td><td> </td><td> </td><td> </td> </tr> </table> | | | | | | | NEW PT. | 1 | 2 | 3 | 4 | 5 | | HISTORY | | | | | | | P. EXAM | | | | | | | MDM | | | | | |
| | | | NEW PT. | 1 | 2 | 3 | 4 | 5 | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | HISTORY | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | P. EXAM | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | MDM | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | NEW (1=10 min) (2 = 20 min) (3= 30 min) (4= 45 min) (5= 60 min) **only 1/2 of time listed above need be counseling or coordination of care **but, total time must be documented | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| DATE: | | ATTENDING: | | | RESIDENT: | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| DATE DICTATED: | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

Coding Models from Asthma (Established Patient) *Need 2 out of 3 Areas Documented*

| Code | 99211 | 99212 | 99213 | 99214 | 99215 |
|-------------------------------|---|---|--|---|---|
| Description | Nursing evaluation or nursing education (<i>RN demonstrates how to use nebulizer machine or reviews how to use spacer</i>) Must at least document reason for visit. | Follow-up asthma with exam limited to lungs | Visit for wheezing | Visit for wheezing and fever | Visit for wheezing and fever. Chronic history of wheezing and poor weight gain. |
| History | None | Problem-focused history Chief complaint, history of treatment, No current symptoms | Expanded problem focused history Chief complaint Brief HPI, Duration, context, severity of current wheezing, modifying factors, history of treatment ROS with at least 1 pertinent system PFSH not required | Detailed history Chief complaint HPI with 4 or more elements Duration, context, severity of current wheezing, modifying factors, history of treatment ROS at least 2 systems Fever/cough/URI symptoms PFSH at least 1 pertinent area Presence of sick contacts, smoking at home, new pets? | Comprehensive history Chief complaint HPI with 4 or more elements Duration, context, severity of current wheezing, modifying factors, history of treatment ROS 10 or more systems or some systems with statement "all others negative" <i>(need 2 out of 3 of the following, PMH, SH or FH)</i> PMH previous hospitalizations/ episodes of wheezing SH: Presence of sick contacts, smoking at home, new pets FH: atopy, asthma, eczema, |
| Physical Examination | None | Description of lung exam | Expanded problem focused (2-7 areas) General Heart Lungs Abdomen Extremities Hydration status | Detailed (6-7 areas) General Ears/Nose/Pharynx Neck Heart Lungs Abdomen Extremities Hydration status | Comprehensive (9 or more areas) General Ears/Nose/Pharynx Neck Heart Lungs Abdomen Extremities Hydration status Skin Neurologic exam |
| Medical Decision Making (MDM) | None | Straightforward MDM Completion of medication, no need for further therapy | Low complexity MDM Treatment, need for follow-up, need for consultation | Moderate Complexity MDM Consideration of pneumonia on differential diagnosis, Plan for treatment Need for lab tests, x-rays, need for follow-up, Need for consultation | High Complexity MDM Consideration of other diagnosis for wheezing and poor growth. Plan for treatment. Need for lab tests, x-rays, need for follow-up, Need for consultation. Review of growth charts, previous medications and hospitalizations, diet history. |
| Total time | 5 minutes | 10 minutes | 15 minutes | 25 minutes | 40 minutes |
| Counseling Time | At least ½ of above | At least ½ of above | At least ½ of above | At least ½ of above | At least ½ of above |

Coding Models from Asthma (New Patient) *Need ALL 3 Areas Documented*

| Code | 99201 | 99202 | 99203 | 99204 | 99205 |
|-------------------------------|---|---|---|--|--|
| Description | Follow-up asthma with exam limited to lungs | Follow-up asthma with exam limited to lungs | Visit for wheezing | Visit for wheezing and fever | Visit for wheezing and fever. Chronic history of wheezing and poor weight gain. |
| History | Problem-focused history Chief complaint, history of treatment, No current symptoms | Expanded Problem-focused history Chief complaint, history of treatment, difficulties with medication, current symptoms ROS with at least 1 pertinent system | Detailed history Chief complaint HPI with 4 or more elements Duration, context, severity of current wheezing, modifying factors, history of treatment ROS at least 2 systems Fever/cough/URI symptoms PFSH at least 1 pertinent area Presence of sick contacts, smoking at home, new pets? | Comprehensive history Chief complaint HPI with 4 or more elements Duration, context, severity of current wheezing, modifying factors, history of treatment ROS 10 or more systems or some systems with statement "all others negative" <i>(need all 3 of the following, PMH, SH & FH)</i> PMH previous hospitalizations/episodes of wheezing SH: Presence of sick contacts, smoking at home, new pets FH: atopy, asthma, eczema, | Comprehensive history Chief complaint HPI with 4 or more elements Duration, context, severity of current wheezing, modifying factors, history of treatment ROS 10 or more systems or some systems with statement "all others negative" <i>(need all 3 of the following, PMH, SH & FH)</i> PMH previous hospitalizations/episodes of wheezing SH: Presence of sick contacts, smoking at home, new pets FH: atopy, asthma, eczema, |
| Physical Examination | Description of lung exam | Expanded problem focused (2-7 areas) General Heart Lungs Abdomen Extremities Hydration status | Detailed (6-7 areas) General Ears/Nose/Pharynx Neck Heart Lungs Abdomen Extremities Hydration status | Comprehensive (9 or more areas) General Ears/Nose/Pharynx Neck Heart Lungs Abdomen Extremities Hydration status Skin Neurologic exam | Comprehensive (9 or more areas) General Ears/Nose/Pharynx Neck Heart Lungs Abdomen Extremities Hydration status Skin Neurologic exam |
| Medical Decision Making (MDM) | Straightforward MDM Completion of medication, need for further therapy | Straightforward MDM Completion of medication, need for further therapy | Low complexity MDM Treatment, need for follow-up, need for consultation | Moderate Complexity MDM Consideration of pneumonia on differential diagnosis, Plan for treatment Need for lab tests, x-rays, need for follow-up, Need for consultation | High Complexity MDM Consideration of other diagnosis for wheezing and poor growth. Plan for treatment. Need for lab tests, x-rays, need for follow-up, Need for consultation. Review of growth charts, previous medications and hospitalizations, diet history. |
| Total time | 10 minutes | 20 minutes | 30 minutes | 45 minutes | 60 minutes |
| Counseling Time | At least ½ of above | At least ½ of above | At least ½ of above | At least ½ of above | At least ½ of above |

Master Trainers



PACE Master Trainers

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Clark NM, Nothwehr F, Gong M, Evans D, Maiman LA, Hurwitz ME, Roloff D and Mellins RB. "Physician-patient partnership in managing chronic illness." *Academic Medicine*, 70(11): 957-9, 1995. Also appears at www.academicmedicine.org.

Survey Instruments

"Parent/Caregiver Telephone Interview Questionnaire," University of Michigan School of Public Health, fielded July 2001-September 2004.

"Physician questionnaire," University of Michigan School of Public Health, fielded July 2001-September 2004.

Audiovisuals

PACE Train the Trainers, 20-minute instructional video about the PACE program, demonstrating how physicians can train themselves to conduct PACE seminars in their communities. Ann Arbor, MI: University of Michigan, 2006.

Physician Asthma Care Education (PACE), 45-minute instructional video demonstrating strategies to improve physician-patient communication and educational messages that will improve the quality of asthma care. Ann Arbor, MI: University of Michigan, 2001.

World Wide Web Sites

www.nhlbi.nih.gov/health/prof/lung/index.htm Website created to disseminate PACE program and facilitate public access to the PACE program materials. Bethesda, MD: National Heart Lung and Blood Institute of the National Institutes of Health. Website to be launched in spring 2007.

http://www.asthma.umich.edu/Products_and_Resources/PACE.html Webpage on the Allies Against Asthma website created to help disseminate the PACE program and facilitate public access to PACE program materials. Ann Arbor, MI: Center for Managing Chronic Disease at the University of Michigan. May 2006.

Sponsored Workshops

"PACE Seminar," August 6, 2005, Columbus, OH. Attended by 7 physicians, behavioral scientists, and project staff.

"PACE Seminar," June 11, 2005, St. Paul, MN. Attended by 8 physicians, behavioral scientists, and project staff.

"PACE Seminar," January 8, 2005, Columbus, OH. Attended by 8 physicians, behavioral scientists, and project staff.

"PACE Train the Trainers," April 16-18, 2004, Tempe, AZ. Attended by 15 physicians, behavioral scientists, and project staff.

"PACE Train the Trainers: American Lung Association of Minnesota," February 28-March 2, 2003, Chaska, MN. Attended by health care providers and health educators.

"PACE Train the Trainers: Centers for Disease Control and Prevention, Preventing Asthma in America's Cities Program," January 2003, Chicago, IL. Attended by health care providers, researchers, and health educators.

"PACE Train the Trainers: Allies Against Asthma," November 2002, Washington, D.C. Attended by 48 physicians, behavioral scientists, and project staff.

"PACE Seminar," October 19-23, 2002, American Academy of Pediatrics National Convention & Exhibition, Boston, MA. Attended by health care providers.

"PACE Seminar," June 21 and 29, 2002, Indianapolis, IN. Attended by 17 physicians, behavioral scientists, and project staff.

"PACE Train the Trainers: CAPE Health Plan," October 2002, Detroit, MI. Attended by health care providers.

"PACE Seminar (abbreviated)," April 17-20, 2002, American Academy of Pediatrics SuperCME Conference, Orlando, FL. Attended by 40 physicians.

"PACE Seminar," April 12 and 20, 2002, Grand Rapids, MI. Attended by 20 physicians, behavioral scientists, and project staff.

"PACE Seminar," March 8 and 16, 2002, Nashville, TN. Attended by 15 physicians, behavioral scientists, and project staff.

"PACE Seminar," February 15 and 23, 2002, Omaha, NE. Attended by 18 physicians, behavioral scientists, and project staff.

"PACE Train the Trainers: National Faculty," January 19 and 20, 2002, Miami, FL. Attended by 15 physicians, behavioral scientists, and project staff.

"PACE Seminar," November 30 and December 8, 2001, Corpus Christi, TX. Attended by 24 physicians, behavioral scientists, and project staff.

"PACE Train the Trainers: Regional Faculty," November 10 and 11, 2001, Chicago, IL. Attended by 12 physicians, behavioral scientists, and project staff.

PACE Seminars were also held at the following Allies Against Asthma coalition sites:

"PACE Seminar," 2003-2006, Long Beach, CA. Attended by a total of 179 physicians, behavioral scientists, nurses, and project staff.

"PACE Seminar," Five seminars held between August 5, 2004 and October 10, 2005, Washington, D.C. Attended by a total of 115 physicians, behavioral scientists, nurses, and project staff.

"PACE Seminar," December 2003 and June 2004, San Juan, Puerto Rico. Attended by 7 physicians, behavioral scientists, and project staff.

"PACE Seminar," September 2003, Philadelphia, PA. Attended by 15 physicians.

"PACE Seminar," 2002-2003, Milwaukee, WI. Attended by 21 clinicians.

"PACE Seminar," December 2002, Hampton Roads, VA. Attended by 20 physicians, behavioral scientists, and project staff.