

# WYOMING DRUG UTILIZATION REVIEW



Edited by  
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## Asthma Therapy in Wyoming

*Scott Johnston, M.D.*

A recent review of asthma therapy in Wyoming identified several areas for improvement. The ideal therapy of the asthmatic patient has been identified by the National Asthma Education Prevention Program and clarified in the 2002 update. Inhaled corticosteroids are the preferred agent for all patients with persistent asthma.<sup>1,2</sup> Any patient having symptoms more than twice weekly or more than 2 nocturnal episodes in a month is defined as having persistent asthma. This equates to the use of more than 1 albuterol inhaler per year. Regular use of an inhaled steroid in Wyoming was only 11% for patients with mild asthma and 16% with moderate/severe asthma. Antibiotics are not recommended for acute exacerbations of asthma unless the patient has a fever, purulent sputum or evidence of pneumonia or sinusitis. Antibiotics were used 87% of the time with acute exacerbations of asthma. A metered dose inhaler with a spacer works as well as nebulizations and costs considerable less than nebulizations. Ipratropium bromide (Atrovent, Combivent, Duoneb) is not recommended except with acute exacerbations of severe asthma but was utilized in 15% of the patients on a chronic basis. Montelukast (Singulair) is not recommended as first line

therapy. Levalbuterol (Xopenex) appears to have more side effects than racemic albuterol and costs 5 times more.<sup>3</sup> Advair (fluticasone/salmeterol) was used but never tapered despite great asthma control. In order to improve the care of asthmatics in Wyoming we should consider using more inhaled steroids and less Singulair, Xopenex, Atrovent, Advair, and antibiotics.

Spiriva (tiotropium) was recently approved for chronic obstructive pulmonary disease (COPD).<sup>4</sup> It should not be used to treat asthma patients. It should not be used in conjunction with ipratropium (Atrovent, Combivent, Duoneb). Tiotropium works better than ipratropium for COPD. Tiotropium works by competitive inhibition at the muscarinic receptor therefore combining tiotropium with ipratropium will decrease the effect.

### References

1. NAEPP Expert Panel Report Guidelines for the Diagnosis and Management of Asthma, <http://www.nhlbi.nih.gov/guidelines/asthma/asthgl.pdf>, visited 16 July, 2004
2. NAEPP EPR 2 Update 2002 <http://www.nhlbi.nih.gov/guidelines/asthma/asthmafullrpt.pdf>, visited 16 July, 2004
3. 2004 PDR publisher Thomson PDR Monvale NJ, pp3114-3118
4. Chute, A Spiriva Handihaler Formulary Dossier, Letter 2004

### Cost Comparison of Asthma Medications

(Average wholesale price/month less discount for Medicaid.)

| Medication          | Cost  |
|---------------------|-------|
| Albuterol MDI       | 15.00 |
| Albuterol Syrup     | 24.75 |
| Alupent MDI         | 35.16 |
| Albuterol HFA       | 43.96 |
| Albuterol Rotocaps  | 45.50 |
| Albuterol vial nebs | 44.00 |
| Maxair DPI          | 45.82 |
| Atrovent vial nebs  | 59.00 |

| Medication             | Cost   |
|------------------------|--------|
| Ipratropium MDI        | 66.33  |
| Atrovent/albuterol MDI | 69.41  |
| Maxair (Pirbuterol)    | 91.63  |
| Serevent MDI           | 91.89  |
| Atrovent/albuterol neb | 208.00 |
| Xopenex neb            | 270.00 |
| Spiriva                | 162.50 |
| Flovent 110            | 44.70  |
| Flovent 220            | 34.70  |

| Medication          | Cost   |
|---------------------|--------|
| Azmacort            | 110.19 |
| Beclomethasone      | 98.12  |
| Aerobid             | 96.96  |
| Pulmicort DPI       | 70.60  |
| Pulmicort vial nebs | 137.40 |
| Singulair           | 98.40  |
| Accolate            | 83.24  |
| Zyflo               | 106.40 |

# Current Practice Guidelines for Asthma

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In 1991 and 1997, the National Institutes of Health and the National Heart, Lung, and Blood Institute, through the National Asthma Education and Prevention Program (NAEPP), issued guidelines for the diagnosis and management of asthma. Selected topics from the 1997 report<sup>1</sup> were updated in 2002. The following two tables were adapted from the 2002 report.<sup>2</sup>

2. National Asthma Education and Prevention Program (NAEPP), National Institutes of Health (NIH), National Heart, Lung, and Blood Institute (NHLBI). Expert panel report: guidelines for the diagnosis and management of asthma -update on selected topics. Bethesda (MD): 2002 July. 149 p.

Abbreviations: PEF – peak expiratory flow, FEV<sub>1</sub> – forced expiratory volume in one second, LDIC – low-dose inhaled corticosteroids, LMDIC – low-to-medium dose inhaled corticosteroids, LAIBA – long-acting inhaled beta<sub>2</sub>-agonists, HDIC – high-dose inhaled corticosteroid, MDIC – medium-dose inhaled corticosteroids

## References

1. National Asthma Education and Prevention Program (NAEPP), National Institutes of Health (NIH), National Heart, Lung, and Blood Institute (NHLBI). Expert panel report 2 guidelines for the diagnosis and management of asthma. Bethesda (MD): 1997 July. 153 p.

| Stepwise Approach to Managing Asthma in Adults and Children Older Than 5 |  |   |   |
|--|--|---|---|
| Clinical Severity  | Clinical Features Before Treatment or Control:   |   | Daily Medications Needed for Long-Term Control  |
|  | Daytime Symptoms<br><i>Nighttime Symptoms</i>  | PEF or FEV <sub>1</sub><br><i>PEF variability</i> |   |
| Step 1<br>Mild persistent  | ≤ 2 days/week<br>≤ 2 <i>nights/month</i>   | ≥ 80%<br>< 20%                                    | No daily medication needed<br>Course of systemic corticosteroids for severe exacerbations                                       |
| Step 2<br>Moderate persistent  | > 2/week but < 1x/day<br>> 2 <i>nights/month</i>   | ≥ 80%<br>20-30%                                   | Preferred: LDIC<br>Alternative: cromolyn, leukotriene modifier, nedocromil OR SR theophylline                                   |
| Step 3<br>Severe persistent  | Daily<br>> 1 <i>night/week</i>   | > 60% to < 80%<br>> 30%                           | Preferred: LMDIC + LAIBA<br>Alternative: ↑ inhaled steroid to medium dose range OR LMDIC + leukotriene modifier or theophylline |
| Step 4<br>Severe persistent  | Continual<br><i>Frequent</i>   | ≤ 60%<br>> 30%                                    | Preferred: HDIC + LAIBA +/- oral corticosteroid (2 mg/kg/day, not to exceed 60 mg/day)  |
| Quick Relief for all patients  | 2-4 puffs of a short-acting inhaled beta <sub>2</sub> -agonists PRN for symptoms<br>Treatment intensity dependent on severity; up to 3 treatments at 20 minute intervals or a single nebulizer treatment as needed. Course of systemic corticosteroids may be needed<br>The use of short acting beta <sub>2</sub> -agonists > 2x/week in intermittent asthma (daily, or increasing use in persistent asthma) may indicate the need for initiating (increasing) long-term control therapy |   |   |

| Stepwise Approach to Managing Acute or Chronic Asthma in Infants and Children Younger Than 5 |  |  |  |
|--|--|--|--|
| Clinical Severity  | Clinical Features Before Treatment or Control:   |  | Daily Medications Needed for Long-Term Control   |
|  | Daytime Symptoms<br><i>Nighttime Symptoms</i>  |  |  |
| Step 1<br>Mild persistent  | ≤ 2 days/week<br>≤ 2 <i>nights/month</i>   |  | No daily medication needed   |
| Step 2<br>Moderate persistent  | > 2/week but < 1x/day<br>> 2 <i>nights/month</i>   |  | Preferred: LDIC (with nebulizer or MDI with holding chamber with or without face mask or DPI (dry-powder inhaler))<br>Alternative: cromolyn (nebulizer preferred or MDI with holding chamber or leukotriene receptor antagonist) |
| Step 3<br>Severe persistent  | Daily<br>> 1 <i>night/week</i>   |  | Preferred: LDIC + LAIBA OR MDIC<br>Alt.: LDIC and a leukotriene receptor antagonist or theophylline<br>Preferred for severe exacerbations: MDIC + LAIBA  |
| Step 4<br>Severe persistent  | Continual<br><i>Frequent</i>   |  | Preferred: HDIC + LAIBA +/- oral corticosteroid (2 mg/kg/day, not to exceed 60 mg/day)   |
| Quick Relief for all patients  | Preferred: SAIBA by nebulizer or face mask and space/holding chamber<br>Alternative: Oral beta <sub>2</sub> -agonists for a mild exacerbation because immediate relief will not occur<br>With a viral respiratory infection, a bronchodilator Q 4-6 H for 24 H or systemic corticosteroid may be needed<br>The use of short acting beta <sub>2</sub> -agonists > 2x/week in intermittent asthma (daily, or increasing use in persistent asthma) may indicate initiating (increasing) long-term control therapy |  |  |

| <b>Medicaid Top 25 Drugs for SFY '04</b> |                  |                                       |                              |
|--|------------------|---------------------------------------|------------------------------|
| <b>Ranking</b>                           | <b>Drug Name</b> | <b>Use</b>                            | <b>Total Expenditure</b>     |
| 1  | Zyprexa          | Anti-Psychotic (Mental Health)        | \$2,355,798                  |
| 2  | Risperdal        | Anti-Psychotic (Mental Health)        | \$1,326,018                  |
| 3  | Seroquel         | Anti-Psychotic (Mental Health)        | \$1,305,486                  |
| 4  | Zoloft           | SSRI (Anti-Depressant--Mental Health) | \$911,461                    |
| 5  | Neurontin        | Anti-Convulsant                       | \$885,520                    |
| 6  | Depakote         | Anti-Convulsant                       | \$881,474                    |
| 7  | Effexor          | Anti-Depressant (Mental Health)       | \$758,850                    |
| 8  | Singular         | Asthma                                | \$744,268                    |
| 9  | Duragesic        | Narcotic Analgesic (Pain)             | \$678,730                    |
| 10                                       | Zithromax        | Antibiotic                            | \$660,556                    |
| 11                                       | Prevacid         | Proton Pump Inhibitor (Ulcer)         | \$614,424                    |
| 12                                       | Lexapro          | SSRI (Anti-Depressant--Mental Health) | \$614,294                    |
| 13                                       | Advair           | Asthma                                | \$577,678                    |
| 14                                       | Lamictal         | Anti-Convulsant                       | \$576,452                    |
| 15                                       | Concerta         | Attention Deficit                     | \$561,748                    |
| 16                                       | Zyrtec           | Non-Sedating Antihistamine            | \$526,388                    |
| 17                                       | Oxycontin        | Narcotic Analgesic (Pain)             | \$515,180                    |
| 18                                       | Strattera        | Attention Deficit                     | \$513,300                    |
| 19                                       | Synagis          | Anti-Viral                            | \$500,011                    |
| 20                                       | Wellbutrin       | Anti-Depressant (Mental Health)       | \$482,674                    |
| 21                                       | Topamax          | Anti-Convulsant                       | \$473,334                    |
| 22                                       | Adderal          | Attention Deficit                     | \$448,208                    |
| 23                                       | Lipitor          | Statin (Cholesterol)                  | \$442,007                    |
| 24                                       | Abilify          | Anti-Psychotic (Mental Health)        | \$434,536                    |
| 25                                       | Celexa           | SSRI (Anti-Depressant--Mental Health) | \$412,848                    |
|  |                  |                                       | <b>Total: \$18,201,243</b>   |
|  |                  |                                       | <b>37% of Overall Budget</b> |

| <b>Medicaid Therapeutic Class Expenditures for SFY '02, SFY '03, and SFY '04</b> |                |                |                |
|--|----------------|----------------|----------------|
| <b>Therapeutic Class</b>   | <b>SFY '02</b> | <b>SFY '03</b> | <b>SFY '04</b> |
| Analgesics   | \$1,528,702    | \$1,865,624    | \$2,371,770    |
| Alzheimer's  | \$185,956      | \$243,916      | \$326,201      |
| Antibiotics  | \$2,446,717    | \$2,920,809    | \$3,333,248    |
| Anti-Coagulants  | \$502,448      | \$583,323      | \$708,412      |
| Anti-Convulsants   | \$2,656,964    | \$3,152,372    | \$4,033,555    |
| Asthma   | \$1,948,622.39 | \$2,205,424    | \$2,874,197    |
| Attention Deficit  | \$462,899      | \$738,709      | \$1,486,546    |
| Birth Control  | \$249,141      | \$339,682      | \$452,908      |
| C&C Allergy  | \$1,422,407    | \$1,704,198    | \$1,805,340    |
| Cardiovascular   | \$1,952,029    | \$1,966,741    | \$2,183,736    |
| Cholesterol  | \$605,611      | \$759,504      | \$1,020,967    |
| Dermatology  | \$518,705      | \$634,501      | \$880,668      |
| Diabetic   | \$1,543,770    | \$1,790,134    | \$2,156,008    |
| Mental Health  | \$8,166,698    | \$9,107,633    | \$11,131,014   |
| Multiple Sclerosis   | \$501,892      | \$686,904      | \$814,356      |
| NSAIDs/Cox II  | \$1,242,163    | \$968,385      | \$905,551      |
| Skeletal Muscle Relaxants  | \$297,861      | \$388,080      | \$481,786      |
| Ulcer  | \$2,862,703    | \$2,507,592    | \$2,077,711    |
| Urinary Incontinence   | \$374,903      | \$480,558      | \$591,668      |

Wyoming Drug Utilization Review Website  
[www.uwyo.edu/DUR](http://www.uwyo.edu/DUR)

Wyoming Preferred Drug List Website  
[www.uwyo.edu/PDL](http://www.uwyo.edu/PDL)

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