

## ASTHMA IN PREGNANCY – ANMC CLINICAL GUIDELINE

### Section I: Background

Asthma complicates 4-8% of pregnancies. It has been associated with increased rates of premature birth, fetal growth restriction, and preeclampsia. The pathogenesis of asthma involves airway inflammation, and treatment is directed at decreasing airway reactivity and preventing maternal and fetal hypoxia. None of the drugs used in the treatment of asthma are teratogens.

A hand-held peak expiratory flow meter is the simplest and most objective method of evaluating pulmonary function in a pregnant patient with wheezing. A normal peak expiratory flow rate (PEFR) is between 350-550 L/min and is not changed from non-pregnant values. A PEFR of >80% of the patient's normal value is consistent with mild symptoms, and a value <50% of her norm is associated with severe asthma.

As you see below, please emphasize inhaled corticosteroids over prn treatment with beta agonists. Treatment is "stepped up" based on severity of symptoms as determined by to the following 4 category classification:

### CLASSIFICATION OF ASTHMA SEVERITY

#### MILD INTERMITTENT:

-symptom frequency 2 days per week or less, nighttime symptoms 2x per month or less, no interference with normal activity

#### MILD PERSISTENT:

-symptoms more than 2x per week, nighttime symptoms more than 2x per month, minor limitation of normal activities

#### MODERATE PERSISTENT:

-daily symptoms, nighttime symptoms more than once per week, some limitation of normal activities

#### SEVERE PERSISTENT:

-symptomatic throughout the day, nighttime symptoms 4x per week or more, extremely limited activities

### Preferred pharmacologic step therapy of asthma during pregnancy (NAEPP\*)

Mild intermittent:      inhaled short acting beta<sup>2</sup> agonist as needed

- Mild persistent: low dose inhaled glucocorticoid
- Moderate persistent: medium dose inhaled glucocorticoid -or-  
low dose inhaled glucocorticoid plus long-acting beta agonist  
medium dose inhaled glucocorticoid plus long-acting beta agonist, if needed
- Severe persistent: high dose inhaled glucocorticoid plus long-acting beta agonist (prednisone if needed)

\*National Asthma Education and Prevention Program

## **Section II: Management**

### **MAINTENANCE TREATMENT OF ASTHMA IN PREGNANCY**

#### **MILD INTERMITTENT:**

- no daily medications
- short-acting beta agonist (e.g., albuterol inhaler 2 puffs Q4H as needed)

#### **MILD PERSISTENT:**

- low-dose inhaled corticosteroid (e.g., fluticasone [Flovent] 100 mcg per puff 2 puffs BID, -or- budesonide [Pulmicort] 200 mcg per puff 2 puffs BID)
- prn albuterol inhaler as above

#### **MODERATE PERSISTENT:**

- low-dose inhaled corticosteroid + long-acting beta agonist (e.g., fluticasone 100 mcg + salmeterol 50 mcg per puff [Advair] 2 puffs BID; may increase to 4 puffs BID)
- prn albuterol as above
- consider adding a leukotriene receptor antagonists (e.g., montelukast [Singulair] 10 mg PO daily)

#### **SEVERE PERSISTENT:**

- high dose inhaled corticosteroid + long-acting beta agonist (e.g., fluticasone 250-500 mcg + salmeterol 50 mcg per puff [Advair] 2-4 puffs BID)
- prn albuterol as above
- consider adding montelukast as above
- consider adding oral corticosteroid (e.g., prednisone 40-60 mg PO daily tapered over 7-10 days)
- consider adding oral antibiotic (e.g., amoxicillin 500 mg PO TID x5-7 days -or- azithromycin 250 mg PO BID x 4 days) if superimposed infection suspected (URI symptoms, purulent sputum)

## **ACUTE ASTHMA IN PREGNANCY**

Acutely worsening symptoms, unresponsive to the patient's usual medical regimen, and requiring emergency treatment, may pose severe maternal and/or fetal consequences. Physical examination, monitoring oxygen saturation, PEFr, and possibly arterial blood gases, are indicated. The absence of wheezing ("tight chest") may indicate severe respiratory obstruction.

Normal blood gases in pregnancy (at sea level) are:

pH	7.44 <sub>-</sub> 0.4
pCO <sub>2</sub>	29 <sub>+</sub> 3
pO <sub>2</sub>	95 <sub>+</sub> 9
HCO <sub>3</sub>	22 <sub>+</sub> 2
BE	4 <sub>+</sub> 3

-Unlike in non-pregnant patients, a pCO<sub>2</sub> >35 is a danger sign of significant CO<sub>2</sub> retention, and a pCO<sub>2</sub> >42 may signal the need for ICU admission and intubation.

-A PEFr <50% may also indicate the need for hospitalization.

## **PHARMACOLOGIC MANAGEMENT OF ACUTE ASTHMA**

- albuterol by MDI 4-8 puffs Q20 min x4 h –or-
- albuterol by nebulizer 5 mg Q20 min x3 doses
- consider ipratropium by nebulizer 500 mcg Q20 min x3 doses –or-
- ipratropium by MDI 4-8 puffs Q20 min x3 doses
- prednisone 40-80 mg PO in a single or divided dose
- consider methylprednisolone [Solu-Medrol] 60-80 mg IV Q6-12 h
- consider MgSO<sub>4</sub> 2 g IV over 20 min
- consider terbutaline 0.25 mg SQ Q20 min x 3 doses
- supplemental O<sub>2</sub> by re-breather mask to maintain O<sub>2</sub> saturation >95%
- IV fluids to maintain perfusion
- consider antibiotics if signs or symptoms of respiratory infection

## **PERIPARTUM MANAGEMENT OF WOMEN WITH ASTHMA**

### Use these:

- oxytocin is the drug of choice for control of postpartum hemorrhage
- prostaglandin E1 (misoprostol [Cytotec] does not cause bronchoconstriction and is safe
- epidural analgesia is preferred
- women on maintenance steroids should receive "stress dose" steroids in labor (e.g., hydrocortisone [Solu-Cortef] 100 mg IV q8h during labor and x24 h postpartum
- none of the drugs used for asthma contraindicate breast feeding

### Use with caution or don't use these:

- methylergonovine and prostaglandin F<sub>2a</sub> (carboprost [Hemabate] are best avoided
- caution is required with use of both narcotic analgesics and NSAIDs

## REFERENCES

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