## Client
HMSA: PQSR 2007

## Measure Title
APPROPRIATE MONITORING OF THEOPHYLLINE USE

## Disease State
Respiratory

## Indicator Classification
Medication Monitoring

## Strength of Recommendation
C

## Clinical Intent
To ensure that members that are taking Theophylline medication receive the appropriate monitoring tests at a clinically appropriate frequency.

## Physician Specialties
Refer to PQSR 2007 Specialty Matrix

## Clinical Rationale
### Disease Burden
- In 2003, the American Association of Poison Control Centers Toxic Exposure Surveillance System documented 861 toxic exposures to theophylline. Of these, 555 cases were unintentional.[1]

### Reason for Indicated Intervention or Treatment
- Theophylline has a narrow therapeutic index and individuals differ in their metabolic clearance of the medication. High concentrations of theophylline can be toxic,[2, 3] so those taking the medication need to have their medication levels monitored.[4]
- Toxic range serum theophylline concentrations are relatively common among ED populations, and occur mainly as a result of patient and physician dosing errors. [5]

### Evidence supporting Intervention or Treatment
- A meta-analysis of 14 studies looking at therapeutic drug monitoring in patients on theophylline and three other medications found that patients taking theophylline who underwent therapeutic drug monitoring had significantly fewer toxic drug reactions than non-monitored patients.[6]

## Clinical Recommendations
- For patients taking theophylline, the National Asthma Education and Prevention Program, a program of the National Heart, Lung and Blood Institute (NHLBI) recommends routine monitoring of serum theophylline levels to maintain steady state serum concentrations between 5 and 15 mcg/ml.[7] There are no specific recommendations regarding the frequency of monitoring. A 2005 update references these original guidelines for individual drug complications.[8]
- The Joint Council of Allergy, Asthma and Immunology acknowledges that theophylline is metabolized at different rates by different individuals and suggests that “dosage must be individualized on the basis of serum measurements to achieve maximum benefit and safety.[9]
- The Institute for Clinical Systems Improvement 2005 Update “Diagnosis and Outpatient Management of Asthma” suggests a theophylline level test as part of the physical examination for asthma patients.[10]

## Source
Health Benchmarks, Inc.
Denominator: Continuously enrolled members who had at least a 60 day supply of Theophylline during the first 10 months of the measurement year.

Denominator Exclusion: Members who had at least one prescription for Theophylline during the year prior to the index prescription.

Numerator: Members who had Theophylline levels monitored 1 day-2 months after the index prescription

Relevant Billing Codes:

CPT-4 code: 80198

Interpretation of Score: High score implies better performance

Physician Attribution: Attribute prescribing physician from index prescription date.

References:


### Indicator Classification

(Adapted from Health Plan Employer Data Information Set (HEDIS®) technical specifications)

<table>
<thead>
<tr>
<th>Classification</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diagnosis</td>
<td>Measures applicable to patients receiving diagnostic workups for a symptom or condition that delineate appropriate laboratory or radiological testing to be performed (e.g. evaluation of thyroid nodule; pregnancy test in patients with vaginal bleeding or abdominal pain)</td>
</tr>
<tr>
<td>Effectiveness of Care</td>
<td></td>
</tr>
<tr>
<td>Prevention</td>
<td>Measures applicable to asymptomatic individuals that are designed to prevent the onset of the targeted condition (e.g. immunizations).</td>
</tr>
<tr>
<td>Screening</td>
<td>Measures applicable to asymptomatic patients who have risk factors or pre-clinical disease, but in whom the condition has not become clinically apparent (e.g. pap smears; screening for elevated blood pressure).</td>
</tr>
<tr>
<td>Disease Management</td>
<td>Measures applicable to individuals diagnosed with a condition that are part of the treatment or management of the condition (e.g. cholesterol reduction in patients with diabetes; radiation therapy following breast conserving surgery; appropriate follow-up after acute event).</td>
</tr>
<tr>
<td>Medication Monitoring</td>
<td>Measures applicable to patients taking medications with narrow therapeutic windows and/or potential preventable significant side effects or adverse reactions (e.g. thyroid stimulating hormone (TSH) testing after levothyroxine dose change; hepatic enzyme monitoring for patients using antimycotic pharmacotherapy).</td>
</tr>
<tr>
<td>Medication Adherence</td>
<td>Measures applicable to patients taking medications for chronic conditions that are designed to assess patient adherence to medication (e.g. adherence to lipid lowering medication).</td>
</tr>
<tr>
<td>Utilization</td>
<td>Measures applicable to patients receiving treatment for a symptom or condition that advocate appropriate utilization of laboratory and pharmaceutical resources (e.g. conservative use of imaging for low back pain; inappropriate use of antibiotics for viral upper respiratory infection).</td>
</tr>
</tbody>
</table>
Strength of Recommendation Based on a Body of Evidence

FIGURE 2. Algorithm for determining the strength of a recommendation based on a body of evidence (applies to clinical recommendations regarding diagnosis, treatment, prevention, or screening). While this algorithm provides a general guideline, authors and editors may adjust the strength of recommendation based on the benefits, harms, and costs of the intervention being recommended. (USPSTF = U.S. Preventive Services Task Force)