RESPIRATORY/PULMONARY DISORDERS – ASTHMA

Introduction
The well-educated, well-motivated law enforcement officer (LEO) with certain well-managed pulmonary disorders may be able to safely and effectively perform essential job functions. For many pulmonary disorders, the severity of the disease and compliance with the recommended management plan will determine ability to safely perform job duties, rather than the specific diagnosis or management plan. This section addresses disorders of the lungs, bronchi, pleura, and thoracic cage, including the diaphragm. Disorders of the oropharynx, larynx, and trachea will be addressed in the otorhinolaryngology (ENT) section. Disordered nocturnal respiratory conditions, such as obstructive sleep apnea, are discussed in the Sleep Disorders chapter. Disorders related to gas transfer beyond the pulmonary/blood interface are discussed in the Cardiology and Hematology sections.

Obstructive Lung Disease
Asthma and chronic obstructive pulmonary disease (COPD) both have acute and chronic aspects of airflow obstruction that may adversely affect safe performance of law enforcement job functions.

Asthma
For LEOs diagnosed with asthma, other than a history of resolved childhood asthma, initial evaluation should be performed to classify them as “well-controlled,” “not-well-controlled” or “poorly controlled” (see Appendix B for evaluation recommendations).

In the majority of cases, asthma can be controlled as to not adversely affect an individual’s ability to safely and effectively perform essential LEO job functions. However, effective management of asthma is highly dependent on compliance with optimal medical recommendations. In some cases, despite this compliance, asthma may impair a LEO’s ability to safely and effectively perform essential job functions.

Well-Controlled Asthma
LEOs with well-controlled asthma (see Appendix B on assessing degree of control) should be evaluated using job simulation tasks (without any immediate pre- or during-test use of a short-acting beta agonist [SABA]) consistent with their agency’s essential job functions.

- LEOs with well-controlled asthma who satisfactorily perform the specified job simulation tasks should have no restriction from full duty for asthma.
- LEOs with well-controlled asthma who are unable to satisfactorily perform the specified job simulation tasks should be restricted from full duty and referred to their treating physician for re-evaluation and possible modification of current treatment regimen (see Appendix B on re-assessment). If the LEO is approved by the treating physician to undergo repeat job simulation tasks, the decision should be reviewed by the police physician. If the police physician is in agreement with the treating physician, the LEO should repeat the same job simulation tasks previously performed.
- LEOs who satisfactorily perform the repeat job simulation tasks should have no restriction from full duty.
- LEOs who are unable to satisfactorily perform the repeat job simulation tasks, should remain restricted from full duty and be referred back to their treating physician for further assessment regarding the diagnosis as well as the treatment plan (see Appendix B).

If re-approved by their treating physician to be evaluated using job simulation tasks, the decision should again be reviewed by the police physician. If the police physician is in agreement with the treating physician, the LEO should repeat the same job simulation tasks previously performed.
- LEOs who satisfactorily perform the repeat job simulation tasks should have no restriction from full duty.
• LEOs who are **unable to satisfactorily perform** the second repeat job simulation tasks, should **remain restricted** from full duty.

This process may be repeated, as per agency policy; however, in order to be cleared for full duty, the LEO should successfully complete job simulation tasks consistent with their agency’s essential job functions (see Appendix C).

LEOs with well-controlled asthma who have satisfactorily completed the exercise challenge testing and have **no restriction** from full duty should be monitored on, at minimum, an annual basis, per the Task Group consensus.

**Not-Well-Controlled Asthma**

LEOs determined to have not-well-controlled asthma (see Appendix B on assessment of degree of control) with no history of job performance difficulties potentially due to asthma should be:

1. evaluated using job simulation tasks (without any immediate pre- or during-test use of a SABA consistent with their agency’s essential job functions (see Appendix C for discussion of job simulation tasks) unless they have other contraindications to physical exertion, in which case, they should be evaluated by the criteria in the relevant section of these guides; AND
2. referred to their treating physician for re-evaluation and possible modification of current treatment regimen.

LEOs with not-well-controlled asthma who **satisfactorily perform** the specified job simulation tasks should have **no restriction** from full duty for asthma pending re-assessment by their treating physician (see Appendix B regarding re-assessment).

LEOs with not-well-controlled asthma who are **unable to satisfactorily perform** the specified job simulation tasks should be **restricted** from full duty pending re-assessment by their treating physician (see Appendix B regarding re-assessment).

If approved by the treating physician to undergo repeat job simulation tasks, the decision should be reviewed by the police physician. If the police physician is in agreement with the treating physician, the LEO should repeat the same job simulation tasks previously performed.

• LEOs who **satisfactorily perform** the **repeat** job simulation tasks should have **no restriction** from full duty.
• LEOs who are **unable to satisfactorily perform** the repeat job simulation tasks, should **remain restricted** from full duty and be **referred back** to their treating physician for further assessment regarding the diagnosis as well as the treatment plan (see Appendix B).

If re-approved by their treating physician to be evaluated using job simulation tasks, the decision should again be reviewed by the police physician. If the police physician is in agreement with the treating physician, the LEO should repeat the same job simulation tasks previously performed.

• LEOs who **satisfactorily perform** the **repeat** job simulation tasks should have **no restriction** from full duty.
• LEOs who are **unable to satisfactorily perform** the second repeat job simulation tasks, should **remain restricted** from full duty.

This process may be repeated, as per Agency policy; however, in order to be cleared for full duty, the LEO should successfully complete job simulation tasks consistent with their agency’s essential job functions (see Appendix C).
LEO Respiratory/Pulmonary Section – Asthma

LEO initially assessed to have not-well-controlled asthma who have been re-evaluated, have satisfactorily completed the exercise challenge testing and have **no restriction** from full duty should be monitored on, at minimum, an annual basis, per the Task Group consensus.

**Poorly Controlled Asthma**

Persons with poorly controlled asthma (see Appendix B for information on assessment of degree of control) should be **restricted** from full duty and referred to their treating physician for re-assessment and modification of treatment.

If approved by their treating physician to be evaluated using job simulation tasks, the decision should be reviewed by the police physician. If the police physician is in agreement with the treating physician, the LEO should be evaluated using job simulation tasks (without any immediate pre- or during-test use of a SABA consistent with their agency’s essential job functions – see Appendix C for discussion of job simulation tasks evaluation) unless they have other contraindications to physical exertion, in which case, they should be evaluated by the criteria in the relevant section of these guides.

- LEOs who **satisfactorily perform** the job simulation tasks should have **no restriction** from full duty.
- LEOs who are **unable to satisfactorily perform** the job simulation tasks, should **remain restricted** from full duty and be **referred back** to their treating physician for further assessment regarding the diagnosis as well as the treatment plan (see Appendix B on reassessment). If re-approved by their treating physician to be evaluated using job simulation tasks, the decision should again be reviewed by the police physician. If the police physician is in agreement with the treating physician, the LEO should repeat the same job simulation tasks previously performed.
- LEOs who **satisfactorily perform** the **repeat** the repeat job simulation tasks should have **no restriction** from full duty.
- LEOs who are **unable to satisfactorily perform** the second repeat job simulation tasks, should **remain restricted** from full duty.

This process may be repeated, as per agency policy; however, in order to be cleared for full duty, the LEO should successfully complete job simulation tasks consistent with their agency’s essential job functions (see Appendix C).

LEOs initially evaluated initially as having poorly controlled asthma who have been re-evaluated, have satisfactorily completed the exercise challenge testing and have **no restriction** from full duty should be monitored on, at minimum, an annual basis, per the Task Group consensus.

**LEOs with On-the-job Performance Issues Potentially Related to Asthma**

LEOs with on-the-job performance issues potentially related to asthma should be **restricted** from full duty and referred to their treating physician for re-assessment and modification of treatment.

If approved by the treating physician to be evaluated using job simulation tasks, the decision should be reviewed by the police physician. If the police physician is in agreement with the treating physician, the LEO should be evaluated using job simulation tasks (without any immediate pre- or during-test use of a SABA consistent with their agency’s essential job functions (see Appendix C for discussion of job simulation tasks evaluation) unless they have other contraindications to physical exertion, in which case, they should be evaluated by the criteria in the relevant section of these guides.

- LEOs who **satisfactorily perform** the job simulation tasks should have **no restriction** from full duty for asthma, but may need further evaluation for other potential medical factors related to the job performance issue cited.
LEOs who are unable to satisfactorily perform the job simulation tasks, should remain restricted from full duty and be referred back to their treating physician for further assessment regarding the diagnosis as well as the treatment plan (see Appendix B regarding reassessment).

If re-approved by their treating physician to be evaluated using job simulation tasks, the decision should again be reviewed by the police physician. If the police physician is in agreement with the treating physician, the LEO should repeat the same job simulation tasks previously performed.

LEOs who satisfactorily perform the repeat job simulation tasks should have no restriction from full duty.

LEOs who are unable to satisfactorily perform the second repeat job simulation tasks, should remain restricted from full duty.

This process may be repeated, as per agency policy; however, in order to be cleared for full duty, the LEO should successfully complete job simulation tasks consistent with their agency’s essential job functions (see Appendix C).

LEOs who had on-the-job performance issues potentially related to asthma who have been re-evaluated, have satisfactorily completed the exercise challenge testing and have no restriction from full duty should be monitored on, at minimum, an annual basis, per the Task Group consensus.

Exercise-Induced Asthma

LEOs with symptoms potentially related to asthma during exercise should be evaluated as not-well controlled or poorly controlled asthma per the sections on “Not-Well-Controlled Asthma” and “Poorly Controlled Asthma.”

LEOs with diagnosed exercise-induced asthma (see Appendix A for definition) with no history of job performance difficulties potentially due to asthma should be evaluated using job simulation tasks consistent with their agency’s essential job functions (see Appendix C) without any immediate pre- or during-test use of a SABA unless they have other contraindications to physical exertion, in which case, they should be evaluated by the criteria in the relevant section of these guides. If they have not had any job performance difficulties potentially due to asthma, they may not need restrictions pending job simulation tasks. The police physician should make individualized decisions based on the history.

LEOs with a history of job performance difficulties potentially due to exercise-induced asthma should be evaluated and managed as outlined in section on LEOs with on-the-job performance issues potentially related to asthma.

LEOs with exercise-induced asthma who satisfactorily perform the specified job simulation tasks without any immediate pre- or during-test use of short-acting beta agonist (SABA) rescue medication should have no restriction from full duty for asthma.

LEOs with exercise-induced asthma who are unable to satisfactorily perform the specified job simulation tasks should be restricted from full duty and referred to their treating physician for re-evaluation and possible modification of current treatment regimen (see Appendix B regarding reassessment).

If approved by the treating physician to be evaluated using job simulation tasks, the decision should be reviewed by the police physician. If the police physician is in agreement with the treating physician, the LEO should undergo repeat job simulation tasks as outlined above in this section.
In order to be cleared to for full duty, the LEO should successfully complete job simulation tasks consistent with their agency’s essential job functions (see Appendix C). Once cleared to full duty, LEO should still undergo continued monitoring. It is the consensus of the Task Group that monitoring should be done annually or more frequently if indicated.

This process may be repeated, as per agency policy; however, in order to be cleared for full duty, the LEO should successfully complete job simulation tasks consistent with their agency’s essential job functions (see Appendix C).

LEOs with exercise-induced asthma who have been re-evaluated, have satisfactorily completed the exercise challenge testing and have **no restriction** from full duty should be monitored on a regular basis for control. It is the consensus of the Task Group that monitoring should be done annually or more frequently if indicated.

**Allergic Asthma**

LEOs with a history of asthmatic reactions on exposure to specific substances may need further evaluation and treatment modification if it is determined that there is a high likelihood of on-the-job exposure to substances that might provoke bronchospasm.

LEOs who have manifested on-the-job performance issues related to asthma on exposure to substances in their work environment should undergo further evaluation and should be restricted from full duty until:

- the allergen has been identified AND
- desensitization has been achieved, OR
- if a specific allergen could not be identified or desensitization could not be achieved, it should be demonstrated that the symptoms can be controlled when placed in the situation in which the original symptoms occurred without use of a SABA.

Since LEOs with allergic asthma may also have underlying bronchial irritability and bronchospasm, they should also undergo job simulation testing without any immediate pre- or during-test use of a SABA consistent with their agency’s essential job functions (see Appendix C) unless they have other contraindications to physical exertion, in which case, they should be evaluated by the criteria in the relevant section of these guides.

If the LEO successfully completes the job simulation tasks, no restrictions should be placed on work activities.

- LEOs with allergic asthma who have met the conditions noted above regarding desensitization or allergen challenge and who **satisfactorily perform** the job simulation tasks should have **no restriction** from full duty.
- LEOs with allergic asthma who are **unable to satisfactorily perform** the specified job simulation tasks should be **restricted** from full duty and referred back to their treating physician for further assessment regarding the diagnosis and treatment plan (see Appendix B regarding reassessment).

If approved by the treating physician to be evaluated using job simulation tasks, the decision should be reviewed by the police physician. If the police physician is in agreement with the treating physician, the LEO should undergo repeat job simulation tasks consistent with their agency’s essential job functions (see Appendix C).

This process may be repeated, as per agency policy; however, in order to be cleared for full duty, the LEO should successfully complete job simulation tasks consistent with their agency’s essential job functions (see Appendix C).
LEOs with allergic asthma who have been re-evaluated, have satisfactorily completed the exercise challenge testing and have **no restriction** from full duty should be monitored on a regular basis for control. A monitoring schedule should be established by the police physician to assess for maintenance of control. It is the consensus of the Task Group that monitoring should be done annually or more frequently if indicated.

**Adult-Onset Asthma**
Asthma that initially manifests during mid adult life should be assessed by the same criteria as above in the sections on “Well-controlled Asthma” through “LEOs with On-the-Job Performance Issues Potentially Related to Asthma.”

**Acute Bronchospasm/Asthma Exacerbation**
In the event of acute asthma exacerbation limiting their ability to work, the LEO with asthma should inform their supervisor(s) that they have a medical condition which, in their opinion, requires that they be restricted from full duty. Before returning to full duty they should be evaluated by the police physician. The police physician should re-evaluate the LEO’s asthma control status as per the section above on “LEOs with On-the-Job Performance Issues Potentially Related to Asthma.”
Appendix A – Asthma and Law Enforcement Fitness-for-Duty

Asthma has been classified in various manners over the past 70 years with the current predominant clinically used classification based on a pathophysiologic concept of asthma as a disease primarily of airway inflammation dating from the 1960s. More recent research is leading to appreciation of a heterogeneous group of phenotypes with potential genetic implications. This evolving understanding is anticipated to improve individualization of treatment and lead to improvement in the number of patients able to achieve near complete control.

The 2007 National Asthma Education and Prevention Program’s Expert Panel Report 3, Guidelines for the Diagnosis and Management of Asthma (EPR-3), and the Global Initiative for Asthma (GINA) 2018 Global Strategy for Asthma Management and Prevention report, promulgate classification schemes based on severity and degree of control, defining asthma broadly as an inflammatory airway disorder with variable and recurring symptoms. Though somewhat older (2007), the EPR-3 model of stratification lends itself better to the purposes of this document’s focus on assessment of whether the status of a person’s asthma represents a degree of impairment or risk of impairment that might adversely affect their ability to safely and effectively perform essential LEO job tasks.

There are some differences between the EPR-3 document and the GINA report. EPR-3 primarily refers to asthma as a disorder of chronic airway inflammation with various manifestations, such as intermittent, persistent, exercise-associated, and aspirin-sensitive. Advances in knowledge of the pathophysiology in various sub-populations have led GINA to modify their definition to “a heterogeneous disease, usually characterized by chronic airway inflammation. It is defined by the history of respiratory symptoms such as wheeze, shortness of breath, chest tightness and cough that vary over time and in intensity, together with variable expiratory airflow limitation.” The variation referred to reflects the variable responses to inhaled steroid medications, variable airway hyper-responsiveness patterns and variation in cell types and quantities found in sputum in different patients. These differences form the basis for evolving discussions of multiple asthma phenotypes.

The remainder of this discussion is primarily based on the EPR-3 since it offers a classification system specifically targeting control in adults that can serve as a framework for the task of decision-making regarding ability to safely and effectively perform essential LEO job functions. Thus, citations will not be made for individual statements of fact unless from other sources, or if they represent points on which EPR-3 and GINA 2018 differ.

Three aspects of the clinical situation have been proposed by EPR-3 for assessing asthma:

- **Severity**, the intrinsic intensity of the disease – Recommended to be assessed on initial presentation or when a person has **not** been using any longer-term control medications, such as inhaled corticosteroids, for at least several months;
- **Control**, the degree to which manifestations of asthma are minimized in persons actively being treated, particularly, with inhaled corticosteroids;
- **Responsiveness**, the ease with which therapy achieves control.

Both **Severity** and **Control** are defined in two domains: **Impairment** and **Risk**.

**Impairment** degree is assessed through a combination of patient recall over the most recent 2 weeks, to a maximum of 4 weeks, of four aspects of effect on the person’s life (daytime symptom frequency, nighttime awakenings, use of SABA for symptom control, interference with normal activity) and spirometric (or Peak Expiratory Flow [PEF]) evaluation of lung function. EPR-3 cites several validated questionnaires for assessment of impairment. These cover some of the same issues of frequency and severity of symptoms, use of rescue inhalers and effect on lifestyle.
Table 1. Validated Questionnaires

<table>
<thead>
<tr>
<th>Questionnaire</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Asthma Control Questionnaire²</td>
<td>6 questions referencing prior 1 week, scored on 7-point scale regarding, PLUS FEV₁ performed by staff at time of questionnaire administration</td>
</tr>
<tr>
<td>Asthma Therapy Assessment Questionnaire⁶</td>
<td>4 questions referencing prior 4 weeks, scored as “Yes/No/Unsure” with rescue inhaler use quantification in addition</td>
</tr>
<tr>
<td>Asthma Control Test⁷</td>
<td>5 questions referencing prior 4 weeks scored on a reverse 5-point scale</td>
</tr>
<tr>
<td>Asthma Control Score⁸</td>
<td>3-dimensional Assessment including Clinical in 4 domains with 5-tiered percent scores, Physiological in 2 domains (FEV₁ or PEF % predicted and PEF variation over 5 days), and inflammatory (airway eosinophil count).</td>
</tr>
</tbody>
</table>

**Risk** addresses the chance of future exacerbations or adverse reactions from medications and is classified according to:
- how many times over the prior year the person had been prescribed oral systemic corticosteroids to assist with resolving an episode of asthma exacerbation;
- the severity of an episode; and
- the interval between episodes.

**Severity**, proposed as an assessment to be performed before any treatment is started or when a person has not been using anti-inflammatory medications for several months, is classified into two categories: *intermittent* or *persistent* with persistent being subdivided into mild, moderate and severe (see Table 1).

**Intermittent** asthma is characterized as 2 or fewer days per week with any symptoms, no nighttime awakening, two or fewer uses of short-acting beta₃-agonist (SABA) for symptom control per week other than with upper respiratory illness-associated exacerbations, no interference with normal activities and no more than one exacerbation having been treated with oral steroids in the prior year.

**Persistent** asthma is defined as more than 2 exacerbations in a year that led to treatment with oral systemic steroids. Persistent asthma is further characterized as mild, moderate, or severe based on frequency and intensity of exacerbations and on activity impairment. No firm data exist to support these classifications.

Table 2: Asthma Severity Classification for Youths ≥12 Years Old and Adults³

<table>
<thead>
<tr>
<th>Components of Severity</th>
<th>Intermittent</th>
<th>Persistent</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mild</td>
<td>Moderate</td>
</tr>
<tr>
<td>Impairment</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Symptoms</td>
<td>≤2 days a week</td>
<td>&gt;2 d/week, not daily</td>
</tr>
<tr>
<td>Nighttime awakening</td>
<td>≤2 times a month</td>
<td>3-4 times a month</td>
</tr>
<tr>
<td>SABA for symptoms</td>
<td>≤2 days/week</td>
<td>&gt;2 d/week, not daily</td>
</tr>
<tr>
<td>Interference with normal activity</td>
<td>None</td>
<td>Minor limitation</td>
</tr>
<tr>
<td>Lung Function</td>
<td>Normal FEV₁: between exacerbations</td>
<td>FEV₁ &gt;80% predicted</td>
</tr>
<tr>
<td></td>
<td>FEV₁/FVC normal</td>
<td>FEV₁/FVC normal</td>
</tr>
<tr>
<td>Risk</td>
<td>0-1/year</td>
<td>≥2/year</td>
</tr>
</tbody>
</table>

*FEV₁, forced expiratory volume in 1 second; FVC, forced vital capacity

**NOTE:** Per EPR-3, inadequate data existed at the time of the report to directly correlate frequency of exacerbations with severity, though it was generally felt that more frequent and intense exacerbations implied more severe disease severity. It was concluded that persons with ≥2 exacerbations requiring oral steroids in the prior year should be categorized as having persistent asthma even if the impairment level was not consistent with persistent disease.
Control has been proposed as the characteristic by which to assess the status of persons under established treatment, with inhaled corticosteroids designated as the foundation.

Table 3: Asthma Control Classification for Youths ≥12 Years Old and Adults (adapted from EPR-3)

<table>
<thead>
<tr>
<th>Components of Control</th>
<th>Well-Controlled</th>
<th>Not-Well-Controlled</th>
<th>Very Poorly Controlled</th>
</tr>
</thead>
<tbody>
<tr>
<td>Impairment</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Symptoms</td>
<td>≤2 days a week</td>
<td>&gt;2 days a week</td>
<td>Throughout the day</td>
</tr>
<tr>
<td>Nighttime awakening</td>
<td>≤2 times a month</td>
<td>1-3 times a week</td>
<td>≥4 times a week</td>
</tr>
<tr>
<td>SABA for symptoms</td>
<td>≤2 days a week, not daily</td>
<td>&gt;2 days a week</td>
<td>Several times a day</td>
</tr>
<tr>
<td>Interference with normal activity</td>
<td>None</td>
<td>Some limitation</td>
<td>Extremely limited</td>
</tr>
<tr>
<td>FEV1 or peak flow</td>
<td>&gt;80% predicted/personal best</td>
<td>60%-80% predicted/personal best</td>
<td>&lt;60% predicted/personal best</td>
</tr>
<tr>
<td>Validated Questionnaire*</td>
<td>ATAQ</td>
<td>ACQ</td>
<td>ACT</td>
</tr>
<tr>
<td></td>
<td>0</td>
<td>&lt;0.75</td>
<td>≥20</td>
</tr>
<tr>
<td>Risk</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Exacerbations requiring oral systemic corticosteroids</td>
<td>0-1/years</td>
<td>≥2/years</td>
<td>Severity and interval since last exacerbation are recommended for additional refinement of risk estimation</td>
</tr>
<tr>
<td>Progressive lung function loss</td>
<td>*Not useful for isolated evaluation as in evaluation of LEOs</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Treatment-related adverse effects</td>
<td>*Covered separately in medications section</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*See above for discussion of validated questionnaires

EPR-3 recommends that persons with asthma be assigned to the most severe category in which any of the features defining a category occurs. ERP-3 states that persons with 2 or more exacerbations in the past year who otherwise would be classified as well-controlled may be considered as having not-well-controlled asthma for purposes of treatment decisions.

It is important to recognize that asthma is not a static disorder. A person’s status in terms of severity or control can change in either direction. Additionally, persons in any category, including intermittent asthma, despite appearing well-controlled, can have severe acute attacks.9

The exacerbation measure used by EPR-3 is the risk of an exacerbation requiring hospitalization or use of oral steroids. The EPR-3 and supporting literature do not address risk of exacerbations that may have limited a person’s ability to participate in activities.

The effect of asthma exacerbations on a person’s functional capabilities is highly variable. No medical literature has been identified that directly assesses functional capacity of persons with active bronchospasm.

At least one study has demonstrated that it is possible to achieve total control in nearly all adult patients with asthma, defining total control as an 8 week period with no symptoms or SABA use in 7 of the 8 weeks and daily morning peak expiratory flow ≥80% predicted.10 Additionally, with improved appreciation of the genomic and phenomic factors involved in the current diagnostic term of “asthma,” improved targeted treatments are anticipated.11,12

Other Reactive Airway Disease Manifestations
Advancing understanding of the pathophysiology of reactive airway disorders has led to increasing appreciation of various different manifestations that respond differently to treatment and also have varying clinical courses. A full discussion of various phenotypes is both beyond the scope of this document and not
particularly helpful at this point in evolution of understanding for the purposes of assessing subjects for impairment or risk of sudden impairment. However, this evolving understanding does improve the clinician's appreciation that some persons may not be able to achieve control of their asthma despite strict adherence to a medical regimen considered optimal by today's standards. These issues have, as of late 2016, been studied essentially only in the population of persons classified as having severe asthma.

**Exercise-induced Asthma**

Exercise-induced asthma refers to bronchospasm that occurs *after* a person has participated in exercise, more commonly in cool to cold, dry air. It is defined by at least a 10% decrease in, preferably, FEV$_1$ as opposed to peak expiratory flow, using the lowest FEV$_1$ value recorded within 30 minutes after exercise.$^{13}$

Persons experiencing this phenomenon may have no other symptoms or evidence of asthma, particularly the inflammatory components. Persons with true exercise-induced asthma, as defined above, rarely have difficulty performing high-level physical activity.

Much more common is the phenomenon of persons experiencing wheezing and limitation *during* exercise. This situation is deemed by pulmonologists to more likely represent poorly controlled underlying asthma with inflamed airways that are primed to experience bronchospasm when irritated by the drying effect of increased bronchial air flow associated with exercising. Thus, the exercise difficulty in these patients may well be relieved by altering the patient’s baseline medication use.

EPR-3 concluded that, since exercise-induced bronchospasm (EIB) is often a marker for inadequate asthma management and that it responds well to anti-inflammatory treatment, persons with this condition should be monitored closely for any symptoms of asthma or decrease in peak expiratory flow when not exercising, thus suggesting a need to reclassify to a more persistent asthma status.
Appendix B – Assessment and Classification of Asthma for LEO Impairment Assessment

Assessment of impairment and risk of sudden incapacitation of LEOs with asthma presents several problems. By the prevailing clinically-applied definition as of early 2017, asthma is a disorder of episodic airflow obstruction with underlying irritability of airways associated with degrees of inflammation. Additionally, the severity of episodes is variable, even in persons who have rare episodes. At the same time, evidence supports that, with good compliance to a treatment program based on maximizing pharmacologic therapy, a majority of adults with asthma can be controlled to a low risk of exacerbation, minimal subjective impairment and normal to minimally reduced pulmonary functional capacity between exacerbations. No trials have been published, however, correlating functional physical exertion impairment objectively to any of the criteria used to assess degree of severity or control in asthma.

Despite the difficulty with objectively assessing either functional impairment or risk of impairing exacerbation, the American Thoracic Society (ATS) has commented that there is little available research to support restricting persons with “appropriately treated” asthma from participation in recreational activities in which the danger of the activity to the person with asthma or to others would be compounded by an asthma exacerbation. This statement by the ATS specifically addresses SCUBA diving. The ATS comments further that guidance on participation in dangerous activities is consensus-based without research evidence.

The National Heart Blood and Lung Institute (NHBLI) 2007 Expert Panel Report 3 (EPR-3): Guidelines for the Diagnosis and Management of Asthma and the 2018 GINA report, both evidence-based reviews and guides for assessment and clinical management of asthma, offer criteria for assessing the degree of control of asthma in persons receiving treatment. These guidelines are based on a combination of subjective report, objective assessment of lung function, and medical history. Guidelines from ATS, the American Medical Association, and Social Security for assessing impairment and disability from asthma also offer methodologies based on a combination of subjective report and objective evaluations.

Since much of the information upon which assessments are made in these guides is subjective, there are no means of verification. No studies directly relating the EPR-3 categories of control with physical effort ability or impairment were identified for this review. Each category includes elements of patient self-assessment of impairment.

Although all four of the above-cited assessment methods use FEV1 as a characteristic for classifying severity of disease, degree of control or degree of impairment, there is no published data directly relating FEV1 to exercise capacity. Studies of patients with COPD have demonstrated a loose relationship, but with a very wide variability among subjects, likely related to underlying degrees of physical fitness.

The current discussion of assessment is founded on the presumption that the police physician is not making primary diagnoses of asthma, but, rather, is evaluating persons who already have an established diagnosis of asthma. The foundations for the diagnosis should be verified by the police physician through review of medical records. It is to be expected that there will be situations in which the police physician will call into question the diagnosis.

Clinical assessment of asthma per EPR-3 has two components, both of which affect ability to safely and effectively perform essential LEO job functions:

- current level of impairment and
- risk of future exacerbations.

Although the frequency of acute episodes of bronchospasm events and the FEV1 can be used to predict overall likelihood of more such events, they do not help predict actual timing or severity of such events. Even persons with infrequent episodes of bronchospasm may have severe episodes.
EPR-3 recommends evaluating persons under treatment for asthma for the level of control, differentiating well-controlled, not-well-controlled and very poorly controlled. Current level of impairment is primarily based on direct interrogation in four subjective dimensions over the most recent 2 to at maximum, 4 weeks, due to degradation of recall over greater time:

- Symptoms;
- Nighttime awakening;
- Interference with normal activity;
- Short-acting beta2-agonist use for symptom control other than exercise-induced bronchospasm (EIB).

EPR-3 recommends that impairment assessment incorporate one of four recommended validated asthma assessment and monitoring instruments (see Table 2). These have not been focused on in these guidelines for evaluation of LEOs since they largely repeat the subjective dimensions noted above, thus making them subject to significant risk of employment-fear bias.

In addition to obtaining a direct history from the person undergoing what is essentially a fitness for duty evaluation, review of medical records is critical to obtaining as much objective information as possible for assessment of both impairment and risk. In order to have a robust understanding of the stability and control of a person’s asthma, the Task Group recommends review of medical records for the preceding 3 years or since diagnosis, if less than 3 years.

EPR-3 recommends that either FEV1 or Peak Expiratory Flow (PEF) be used for objective assessment of pulmonary function. However, peak expiratory flow is considered significantly inferior to formal spirometry testing for FEV1.20 Thus it seems more appropriate to use FEV1 for any objective assessment of LEO pulmonary function remembering that there is no literature directly correlating FEV1 to ability to perform any sort of physical activity, including essential law enforcement job functions.

EPR-3 recommends basing assessment of the risk for future exacerbations on the number of episodes of exacerbation for which oral systemic steroids were prescribed over the year prior to evaluation. The prediction is for risk of experiencing an exacerbation requiring hospital care or systemic oral steroids over the ensuing year. This is of little help in forming a categorical assessment of risk of inability to safely and effectively perform essential LEO job functions.

Based on these evaluation criteria, persons can be classified into three groups: 1) well-controlled; 2) not-well-controlled; and 3) very poorly controlled. Despite the criticism that this 3-tiered system of classification is too simplified for optimizing treatment among the increasing number of phenotypes being defined, it reflects a person’s functional status and risk in a manner that matches concepts of assessing fitness-for-duty.

Initial evaluation and follow-up evaluations should include physical examination of not only the lungs, but also the cardiovascular and muscular systems. Initial and general follow-up evaluations by the police physician generally will not require performance of comprehensive pulmonary function testing. This may be necessary in some cases, though, to differentiate pulmonary from other causes of inability to perform essential job functions. Additionally, the police physician should always remember that there are other disorders that may mimic asthma and be attentive to a possible misdiagnosis, particularly in persons who report difficulty gaining control of symptoms attributed to asthma or with unusual circumstances.

**Some Asthma Mimics in Adults**
- COPD (e.g., chronic bronchitis or emphysema)
- Vocal cord dysfunction
- Medication-induced cough (e.g., angiotensin-converting enzyme (ACE) inhibitors)
• Eosinophilic pulmonary infiltration
• Pulmonary embolism
• Mechanical airway obstruction (e.g., tumors)
• Congestive heart failure

Evaluation of LEOs with asthma should allow for categorizing the LEO into one of three categories: well-controlled, not-well-controlled and poorly controlled (simplified from EPR-3 “very poorly controlled”).

Well-Controlled Asthma
For the purposes of this discussion concerning evaluations for performance of essential law enforcement duties, well-controlled asthma is defined as meeting all of the following EPR-3 criteria:
• Based on a personal report and/or documented evidence over the 4 weeks prior to evaluation of:
  ▪ Symptoms on no more than 2 days per week
  ▪ Nighttime awakening from bronchospasm no more than twice per month
  ▪ No interference with normal physical activities
  ▪ Using a short-acting beta agonist (SABA) for symptoms on no more than 2 days per week
• FEV₁ ≥80% predicted or peak flow ≥80% personal best without pre-test use of a bronchodilator
• No more than one exacerbation requiring use of oral systemic steroids or higher level of care (e.g., hospitalization, intubation) over the past 1 year

The criteria related to scores on the cited validated questionnaires have not been included in the assessment criteria in this document due to the likely elevated risk of employment concern bias on the part of the respondents. If scores of any of these questionnaires are available from medical records, it is reasonable to take them into consideration, though they should have been administered within a few weeks of the LEO evaluation and there should not have been any changes in management plan in the interim for them to be valid. LEOs who do not meet all of the criteria for either well-controlled or not-well-controlled asthma should be classified in the next less well-controlled category.

Not-well-controlled Asthma
The implication of classifying asthma as not-well-controlled and poorly controlled is 2-fold. First, there are likely actions that can be taken that might improve control. At least one published study has demonstrated ability to gain essentially complete control in all adult subjects with asthma (smokers were excluded as well as some other classes). Secondly, since both categories have “increased risk of exacerbations” as a criterion, there is an implied increased risk of possible impairment during performance of essential law enforcement job functions.

LEOs with the following characteristics on the various criteria should be classified as not-well-controlled:
• Personal report or documented evidence over the 4 weeks prior to evaluation of:
  ▪ Symptoms on more than 2 days per week
  ▪ Nighttime awakening from bronchospasm 1-3 times/week
  ▪ Some limitation in normal physical activities
  ▪ Using a short-acting beta agonist (SABA) for symptoms on more than 2 days per week
• FEV₁ 60-80% predicted or peak flow 60-80% personal best without pre-test use of a bronchodilator
• Two or more (≥2) exacerbations requiring use of oral systemic steroids or higher level of care (e.g., hospitalization, intubation) over the past year

Using the criteria presented in EPR-3, if a LEO does not meet all of the above criteria for not-well-controlled, he/she should be classified as having poorly controlled asthma.
As noted above, EPR-3 considers that, for purposes of treatment decisions, persons with ≥2 exacerbations requiring oral systemic corticosteroids in the prior year may be considered as having not-well-controlled asthma even if the other criteria in this list are not met. The rationale was that the increased number of exacerbations of the specified degree was associated with a significant, though unspecified, increase in risk of exacerbations requiring professional health care intervention up to and including ICU care and intubation. Thus, even if someone had been only moderately impaired by the asthma over the prior 4 weeks and the FEV$_1$ was not markedly decreased, the risk of exacerbation was felt to be enough to justify re-assessment and possible adjustment of baseline treatment.

**Poorly Controlled Asthma**

LEOs with the following characteristics on the various criteria should be classified as poorly controlled:

- Personal report or documented evidence over the 4 weeks prior to evaluation of
  - Symptoms throughout the day every day;
  - Nighttime awakening from bronchospasm ≥4 times/week;
  - Significant/extreme limitation in normal physical activities;
  - Using a short-acting beta agonist (SABA) for symptoms several times per day;
- FEV$_1$ ≤60% predicted or peak flow ≤60% personal best without pre-test use of a bronchodilator;
- Two or more (≥2) exacerbations requiring use of oral systemic steroids or higher level of care (e.g., hospitalization, intubation) over the past year.

As noted above, persons who meet any of the symptom or spirometry criteria of poorly controlled should be considered as having poorly controlled asthma. It is the consensus of the Task Group that LEOs with poorly controlled asthma would have a high likelihood to have difficulty performing various physically strenuous law enforcement job functions.

**Allergic Asthma**

Many persons with asthma have some degree of increased reactivity to airborne particles such as pollens and dust, however a subset have IgE-mediated allergic reactions that activate bronchospasm. The general medical management recommendation for such persons involves avoidance and desensitization immunotherapy. Persons who do not respond to avoidance or desensitization in addition to use of either inhaled or oral corticosteroids plus long-acting bronchodilators may respond to immunomodulatory treatments.

LEOs are exposed to a variety of potential allergens without advance knowledge. Thus, avoidance is not a particularly viable operational tactic to mitigate the risk of bronchospasm. Additionally, use of rescue inhalers upon realization of exposure or at onset of symptoms may not be operationally practical.

LEOs with allergic asthma may well have baseline asthmatic reactions as well as baseline altered pulmonary functions that may interfere with physical activities. Thus, as above, it is recommended that they also undergo job task simulation testing.

**Reassessment following failure of adequate performance of job simulation tasks and/or review of care by treating physicians**

LEOs with asthma who are unable to meet the agency criteria on physical activity challenge testing should be referred to their treating physicians for evaluation and optimization of control of their asthma.

Less than optimal control of asthma might be from inadequate pharmacological control of bronchial inflammation or from the presence of comorbidities such as obesity or exposure to irritants (e.g., cigarette smoke). In one large trial, approximately 70% of adults with asthma achieved high levels of control with optimization of a pharmacologic regimen. It has been postulated that the failure to achieve control
in the remaining 30% may be associated with the limitations of the current model that all asthma is based on airway inflammation.

With the increasing understanding of more discrete phenotypes of asthma, it has become evident that there are some patients who, despite complete compliance with optimal currently advocated medication regimens, continue to have persistent poor symptom control. These persons will likely need subspecialist consultations with specialized testing and treatment.

Response to increases in inhaled corticosteroid doses may span several months. The implication of this is that it may take weeks to months for persons with not-well and poorly controlled asthma to reach optimal control.

Once the LEO’s physician has approved them to be evaluated using job simulation tasks, the patient and records should be reviewed by the police physician for familiarization with the treatment plan. It is not anticipated that the police physician would challenge the decision to allow the LEO to take the physical abilities challenge test, although, should the police physician have significant concerns, it is incumbent upon the police physician to challenge the treating physician’s opinion.
Appendix C – Evaluation of Asthma Effect on Ability to Perform Essential Job Functions

Evaluation for any adverse effect of asthma on the ability of a person to perform physically demanding essential job functions has the highest validity if simulated tasks are used for the test. While there are a number of job functions likely to be required by any agency (see Chapter 3 of these guides), there is no standardized set of LEO essential job functions. Thus, agencies wishing to evaluate LEOs with asthma would need to either adopt and adapt a physical task challenge test used by another agency or develop one of their own that would withstand legal challenge.

Essential job duties of law enforcement officers involve both aerobic and anaerobic activities. Many law enforcement activities are short duration, high strength activities such as pushing, pulling or lifting against resistance as in pulling or pushing resisting persons, moving a barrier or dragging an incapacitated person from danger. Ability to safely and effectively execute such actions is primarily dependent on muscle mass that can be engaged in high-power, short-duration mostly anaerobic activity. However, many law enforcement activities are associated with aerobic activity such as running to arrive at the place where the officer will engage in those high-power anaerobic activities. Compared to athletes performing many of the same types of activities such as running or grappling with another person, law enforcement officers have the added component that the success or failure of the needed activity may affect their own survival.

Physical Activity Testing in Law Enforcement: Correlation to Essential Job Tasks

Ability to exert to a specified level for a specified time is dependent on several factors, of which bronchial air exchange, the component of primary concern in asthma, is only one. Inability to perform essential job functions may also be due to other disorders affecting muscle function or to inadequate general fitness.

Job Task Simulation Testing

Throughout this document, job task simulation testing (JTST) was recommended for evaluation of LEOs regarding any adverse effect asthma might have on the ability to perform essential job functions. This recommendation was made for two reasons: 1) we are not aware of studies that correlate any surrogate or fitness testing with the ability to safely and effectively perform the essential job functions of a law enforcement officer; and 2) essential job functions may vary significantly from one agency to another.

One example of a JTST is the Southeastern Pennsylvania Transit Authority (SEPTA) which requires all police officers, male and female, to be able to complete a 1.5 mile run in 12 minutes. This is intended to demonstrate an aerobic capacity of 42.5mL/kg/min. This requirement is based on a study of essential job functions in this specific agency. SEPTA’s standard has been challenged and SEPTA prevailed (Lanning v SEPTA23). Many law enforcement training academies or in-service training facilities have the ability to place individuals in simulations of various job tasks. A physician consulting with a police department may need to work closely with the department’s training division in order to craft a set of simulations that would assess adverse effects of asthma on performance of essential job functions.

Surrogate Testing for Adverse Effect of Asthma

If it is not possible to use a test incorporating essential job function activities, surrogate testing to a level consistent with the maximum aerobic demand likely to be encountered performing essential job functions may be necessary.

No literature has been identified reporting direct assessment of the oxygen consumption or of physiological work load of law enforcement officers performing essential job functions while on-duty. Correlations have been made to published listings of energy expenditure, measured in metabolic equivalents (METs), for other tasks that are similar to components of essential law enforcement job functions.24 The activity-MET list offered by Jetté was generated by expert opinion and a collection of information from members of a panel.
whose agenda was disability assessment. This activity listing of MET equivalents has been maintained and expanded slowly with increasing numbers of activity-associated MET levels being measured directly. Although this list does not offer direct evaluation of incumbent LEOs performing physical LEO tasks, it does offer a number of activities that are likely representative of functions performed by LEOs. Many of these activities have been assigned MET ratings in the range of 12 METs.

Job descriptions for LEOs have also been developed and made public by at least two agencies, most notably Massachusetts Human Resources Division and California Police Officers Standards and Training (POST) Commission. Chapter 3 of this ACOEM guidance for LEOs delineates a set of essential job functions that was developed in conjunction with law enforcement organizations and officers as subject matter experts.

One small study has measured energy expenditure during simulation of a foot chase and apprehension of a resisting person as a part of designing an occupation-specific cardiac rehabilitation program (see Table 4). The peak METs were 14.0 (±2.2) with the mean working MET level was 10.5 (±3.2). Unfortunately, although subjects were fitted with facemasks to measure oxygen consumption, VO2 data were not presented. Additionally, times for completing the task set were not provided. The components of this simulation as presented in Table 3 might serve as a guide for developing an essential-job-function-based physical activity challenge test.

<table>
<thead>
<tr>
<th>Simulation Element</th>
<th>Job Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sprint 150-feet</td>
<td>Foot chase</td>
</tr>
<tr>
<td>Climb up five stairs and descend them 12 times (equivalent to 5 floors)</td>
<td>Chase through an apartment complex</td>
</tr>
<tr>
<td>Scale a 5-foot wooden wall</td>
<td>Climbing over a fence or wall during a foot chase</td>
</tr>
<tr>
<td>Sprint a total of 450 feet, with 100 feet being serpentine through cones and 50 feet involving turning around cones</td>
<td>Diversion run during a foot chase</td>
</tr>
<tr>
<td>Drop to knees and crawl through a 3.5-foot ditch</td>
<td>Crawling through a small space during a foot chase</td>
</tr>
<tr>
<td>Sprint 100 feet and jump over a culvert</td>
<td>Traversing a creek bed or ditch during a foot chase</td>
</tr>
<tr>
<td>Kick and punch a dummy fighter 3 times</td>
<td>Fight during a foot chase</td>
</tr>
<tr>
<td>Drop to knees, roll a 145-lb dummy 3 times one way and 3 times back, and then simulate a behind-the-back arm cuff</td>
<td>Wrestling with and handcuffing a suspect</td>
</tr>
</tbody>
</table>

In a live field operation the actual energy expenditures are likely to be higher than those attributed to surrogate tasks based on the presumption of higher degrees of activity and the added physiological demand from psychological factors.

Whether evaluation is performed using job task simulation or surrogate testing, it is not the role of the police physician to make the determination of whether failure is due to a medical condition or to inadequate conditioning.

**On-going Monitoring of LEOs with Asthma**

Asthma in adults generally does not resolve. Asthma is frequently a progressive disorder. Thus, it is imperative to monitor the status of the LEO with asthma.
Appendix D – Treating Physician Evaluation Form for the Law Enforcement Officer with Asthma

NOTE TO POLICE PHYSICIAN: The following form is presented as an option for obtaining necessary information. Another option is review of medical records.

_________________________________________________________________

DOB: __________________

Examinee Name

You are being asked to evaluate this individual for their asthma condition. It is essential that this person undergo an individualized assessment of his/her pulmonary disorder to assist in determining whether the individual’s condition permits safe and effective job performance.

This evaluation is based on guidance from the American College of Occupational and Environmental Medicine (ACOEM).

I. Introduction:
The well-educated and well-motivated LEO with asthma may be capable of safe and effective job performance. An individualized assessment of the LEO’s or applicant’s asthma should be performed including an assessment of the following:

- Detailed history and physical examination
- Standardized test results (e.g., Spirometry/PFT) when indicated
- Diagnosis (classification and causation)
- Evaluation of treatment plan for optimization
- Nature of provocative agents/conditions
- Frequency of exacerbations and last exacerbation occurrence
- Medication regimen
- Response to medication regimen
- Complications or activity-limiting side-effects from medication regimen
- Compliance with therapy
- Risk of recurrence
- Planning for on-going surveillance

Assessing the inability to safely and effectively perform essential law enforcement job functions, or of experiencing a sudden impairment rendering them unable to do so, is the major concern in evaluating law enforcement officers with lung diseases.

Law enforcement activities involve several issues that need to be considered in regard to those with asthma/bronchospastic disorders and the risk of exacerbations:

- Unanticipated extreme physical activity that, if not executed properly, could result in death or severe disability to others or the law enforcement officer.
- Exposure to environmental provocative agents – e.g., dust, allergens, cold, dry air.
- Exposure to tear gas and pepper spray
II. Assessment
I am a pulmonologist or a physician experienced in the diagnosis and treatment of asthma. □ Yes □ No

1. The examinee has been under my care for asthma since ____________.

2. I have reviewed outpatient and in-patient medical record(s) of the last 1 year or since date of diagnosis (whichever is shorter) □ Yes □ No
   If NO, please explain ____________________________________________________________
   Please provide available records to the police physician for review.

3. Date asthma diagnosed: ____________

4. Has this person had any objective testing (pulmonary function testing, challenge testing, etc.) for asthma within the past year? □ Yes □ No
   If YES, please supply a copy of the results.

5. Does this person meet the criteria of being well-controlled based on the EPR-3 criteria. (See copy of EPR-3 classification table at end of this form) □ Yes □ No
   If YES, how long have they met the criteria of being well-controlled? ____________

6. Medication Regimen
   a. Current asthma medications:
      __________________________________________________________________________
      __________________________________________________________________________

   b. When was the last time the medication regimen was changed? ____________

7. Can this individual participate in high intensity physical activities (equivalent to 12 METs)? □ Yes □ No
   If “NO” please explain.
   __________________________________________________________________________
   __________________________________________________________________________

8. Has this individual been educated in asthma and has he/she been thoroughly informed of the risk of recurrence and the importance of treatment compliance? □ Yes □ No

9. Is the examinee’s activity limited by:
   Weather conditions? □ Yes □ No
   Exposure to environmental asthma triggers or specific allergens? □ Yes □ No
   If YES, please specify:
   __________________________________________________________________________
   __________________________________________________________________________

__________________________ ________________
Signature of Physician       Date

__________________________ _______________________
Printed name of Physician       Phone
<table>
<thead>
<tr>
<th>Impairment</th>
<th>Components of Control</th>
<th>Well-Controlled</th>
<th>Not-Well-Controlled</th>
<th>Very Poorly Controlled</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Symptoms</td>
<td>≤2 d/week</td>
<td>&gt;2 d/week</td>
<td>Throughout the day</td>
</tr>
<tr>
<td></td>
<td>Nighttime awakening</td>
<td>≤2 x/month</td>
<td>1-3x/week</td>
<td>≥4x/week</td>
</tr>
<tr>
<td></td>
<td>SABA for symptoms</td>
<td>≤2 d/week, not daily</td>
<td>&gt;2 d/week</td>
<td>Several times/day</td>
</tr>
<tr>
<td></td>
<td>Interference with normal activity</td>
<td>None</td>
<td>Some limitation</td>
<td>Extremely limited</td>
</tr>
<tr>
<td></td>
<td>FEV₁ or peak flow</td>
<td>&gt;80% predicted/personal best</td>
<td>60% - 80% predicted/personal best</td>
<td>&lt;60% predicted/personal best</td>
</tr>
<tr>
<td></td>
<td>Validated Questionnaire</td>
<td>ATAQ</td>
<td>ACQ</td>
<td>ACT</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0</td>
<td>&lt;0.75</td>
<td>≥20</td>
</tr>
<tr>
<td>Risk</td>
<td>Exacerbations requiring oral systemic corticosteroids</td>
<td>0-1/year</td>
<td></td>
<td>≥2/year</td>
</tr>
<tr>
<td></td>
<td>Progressive lung function loss</td>
<td>Not Useful for isolated evaluation as in evaluation of LEOs</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Treatment-related adverse effects</td>
<td>Covered separately in medications section</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
References