Pulmonary Function Testing Newsletter January 2026

Featured Courses: **Spirometry Refresher (NIOSH-approved):**
August 25, 2026
Interpretation of Spirometry - Beyond the Numbers:
August 26, 2026

In the this issue:

2026 Spirometry Course Schedule

Spirometry - NIOSH-approved initial course:
- Mar 24-26, 2026
- June 16-18, 2026
- Sept 15-17, 2026
- Nov 10-12, 2026

Spirometry Refresher (NIOSH-approved):
- Aug 25, 2026

Interpretation of Spirometry - Beyond the Numbers:
- Aug 26, 2026

To submit a registration request, go to www.DrMcKay.com or , email info@drmckay.com

Online Courses

Spirometry Refresher (NIOSH-approved)
Fundamentals of Spirometry
Email info@drmckay.com for information

Reminder: Refresher Training Due Dates
If your last initial or refresher NIOSH spirometry training was in 2021 your re-certification due date is 2026.

Errors, Omissions, and Inconsistencies in Spirometry Guidelines

Spirometry guidelines (ATS, ERS, and others), have errors, omissions, and inconsistencies. Past issues of this newsletter have identified some of these, now it's time to address another.

Reporting of the FEV1/FVC Ratio

The FEV1/FVC ratio is one of the most important spirometry measurements and is used to distinguish obstructive from non-obstructive patterns. Yet, it's frequently reported incorrectly. Let's explore why.

The 2017 ATS *Recommendations for a Standardized Pulmonary Function Report*

In the 2017 ATS *Recommendations for a Standardized Pulmonary Function Report*, the ATS changed the recommended format for reporting the FEV1/FVC ratio from a percentage to a **decimal fraction**. They further recommended that the measured FEV1/FVC ratio be reported to **two (2) decimal places** (e.g., 0.63). This also applies to the lower limit of normal. The 2019 ATS/ERS Spirometry Update retained this recommendation.

The ATS rationale for expressing the ratio as a decimal fraction is to avoid confusion with other "percent of predicted" values. They believe universal adoption of the decimal fraction method by equipment manufacturers and PFT laboratories would improve interpretation, communication, and overall understanding.

To date, I've not seen published evidence supporting this claim. Moreover, from my perspective, when clinicians or patients see a decimal such as 0.63, they typically convert it, in their minds or verbally, to **63% of the vital capacity was exhaled in the first second**. If users are going to think in percentages anyway, why not report it as a percentage in the first place? In addition, expressing the ratio to the 2nd decimal place loses with a significant digit.

Let's look at data for two subjects A & B.

	Subject **A**	Subject **B**
FEV1	3.66	3.69
FVC	5.25	5.25
FEV1/FVC%	69.7%	70.3%

Both FEV1 and FVC are reported with three (3) significant digits. According to well established **Rules of Significant Figures**, the ratio derived from these measurements should also be reported with three significant digits. In percentage terms, that corresponds to one decimal place, as shown in the examples above (e.g., 69.7% & 70.3%). The rule is: When multiplying or dividing numbers with measured values, the result should be reported with the same number of significant figures as the measurement with the fewest significant figures. Spirometry software often fails to adhere to proper significant-figure rules, but this is the statistically correct approach and the one I teach and have always followed.

If we assume an interpretation algorithm defines FEV1/FVC < 70% as obstructive. Then for the example shown above:

Subject A: 69.7% ➜ obstructive
Subject B: 70.3% ➜ **not** obstructive

What happens if you apply the ATS/ERS recommendation?
The ATS/ERS recommends reporting the ratio as a decimal fraction to the 2nd decimal place. However, this recommendation is inconsistent with the Rules of Significant Figures. As mentioned above, FEV1 and the FVC have 3-significant digits. Therefore, when following accepted **Rules of Significant Figures** for division, when expressing the ratio as a decimal fraction it should be reported with 3-decimal places, **not** 2.

Consequences of Rounding to 2 vs. 3 Decimal Places
To understand the potential consequences, let's look again at subjects A & B. This time expressing the ratio as a decimal fraction with 2 & 3 decimal places.

	Subject **A**	Subject **B**
FEV1	3.66	3.69
FVC	5.25	5.25
FEV1/FVC 2 decimal places	0.70	0.70
FEV1/FVC 3 decimal places	0.697	0.703

Using the same interpretation cutoff (<0.70) with:

2 decimals ➜ neither subject is obstructive
3 decimals ➜ Subject A is obstructive
Subject B is **not** obstructive

Some software may compound the problem by truncating instead of rounding, a separate issue I won't address here.

While the loss of a significant digit will seldom alter a clinical diagnosis or treatment, it's **incorrect measurement practice**, and its downstream effects are often overlooked.

In summary:
I believe there are advantages to expressing the FEV1/FVC ratio as a percentage, rather than as a decimal fraction, and is certainly clearer for most users. When doing so, it should be reported to 1 decimal place to maintain significant digits (e.g. 69.7%).

If you choose to report the FEV1/FVC ratio as a decimal fraction, it should be reported to 3 decimal places (e.g., 0.697), not 2, to maintain significant digits.

Failure to report and/or utilize significant digits has been a common practice in many spirometry guidance documents. Hopefully, future ATS/ERS documents will correct this.

Significance of an Isolated Reduction in FEF25-75%

A 2025 publication by Kurth and colleagues analyzed Coal Workers' Health Surveillance Program (CWHSP) data to evaluate whether reductions in forced mid expiratory flow (FEF25-75 %) can flag risk among miners who otherwise show no obstructive ventilatory impairment. Because FEF25–75% is a measurement of flow between 25% and 75% of FVC, declines in this parameter can occur when the small airways (< 2 mm in diameter) are obstructed. While controversial, there is support in published literature, that reduced mid expiratory flows are possibly suggestive of small airways dysfunction and potentially early airflow obstruction (refer to references 3, 6, & 12 by Kurth).

Using high quality spirometry from 7,616 miners and defining a low FEF25-75% as less than 65% of predicted, the team found an overall prevalence of 7.1% among miners without classic obstructive patterns. The burden was higher with age and among ever smokers. Notably, retired miners and miners reporting respiratory symptoms (wheeze, chronic cough, dyspnea, phlegm) were more likely to have reduced mid expiratory flow. These findings suggest FEF25-75% as a useful surveillance flag when spirometry is otherwise normal, (i.e., helping to identify miners who may be on a trajectory toward more serious ventilatory impairment).

From an interpretation standpoint, most widely used guidelines (such as ATS/ERS, NICE, & GOLD) do **not** even consider an isolated reduction in FEF25-75%. This is largely because the value depends heavily on achieving an acceptable plateau (i.e., end of forced expiration) and tends to be highly variable. I agree that an isolated reduction in FEF25-75% is not specific for small airways disease. However, this does not mean that a well-performed test showing this finding should be excluded from interpretation.

The **McKay** Spirometry Interpretation Algorithm© is the only comprehensive algorithm focused solely on spirometry, that has consistently treated an isolated reduction in FEF25-75% as a potential early sign of airway obstruction **or** small airways dysfunction (without limiting location to the small airways). Rather than being ignored, a low FEF25-75% should raise a red flag, particularly in surveillance programs where early changes matter.

One additional observation. NIOSH-approved spirometry training programs generally align with ATS/ERS technical standards. Consequently core instruction centers on FEV_1 , FVC, and FEV_1/FVC, in part because the standards note that mid expiratory flows (e.g., FEF25–75%) are effort dependent, tied to FVC acceptability criteria, and not specific to small airways disease when used in isolation. NIOSH does not include formal FEF25–75% instruction in the core curriculum and required I remove it as an optional module for my online refresher program. In the Kurth report summarized above, **26%** of unique tests were **excluded** for not meeting acceptability/repeatability or completeness (including missing FEF25–75%, FEV_1, or FVC values). Specific numbers for exclusion were not identified. If students attending spirometry training programs had a better understanding of the FEF25-75%, and how its measurement is affected by FVC, perhaps fewer tests would need to be excluded. Furthermore, persons responsible for interpretation of spirometry should understand what the FEF25-75% measures and learn how to use it in concert with visual observation of the tracings.

One last point: Because FEF25-75% is not currently included in standard NIOSH training materials, many health-care professionals may not be equipped to understand or apply the recent NIOSH findings showing its potential value in detecting small airways dysfunction.

For additional information regarding this study on coal miners, go to the source:
Kurth L, Hall NB, Ansell B, Laney AS, Blackley DJ. Prevalence of Reduced Mid Expiratory Flow Among Coal Workers' Health Surveillance Program Participants. *American Journal of Industrial Medicine*, 2025.

Why Spirometry Results Vary by Time of Day: Especially in Asthmatics

Healthcare professionals conducting spirometry in workplace settings often test individuals with asthma; sometimes symptomatic, sometimes not. Lung function naturally fluctuates throughout the day, and these variations are even more pronounced in asthmatics. Understanding why this happens can help improve test consistency and interpretation.

Why Does Lung Function Vary?

Asthma attacks are more common at night due to several physiologic changes during sleep that increase airway narrowing and reactivity. Here are the major factors, organized from most to least influential:

1. Cortisol levels fall significantly between midnight and 3 AM. Normally, cortisol:

- Reduces airway inflammation
- Limits mucus production
- Maintains beta-2 receptor responsiveness

When cortisol drops:

- Airway inflammation increases
- Mucus production rises
- Bronchodilator responsiveness decreases

Note: Cortisol is not a bronchodilator itself, but it supports mechanisms that enhance bronchodilation.

2. Increased Vagal Tone During Sleep
During deep sleep, the vagus nerve becomes more active, leading to:

- Tightening of airway smooth muscle
- Increased bronchial secretions
- This physiologic bronchoconstriction occurs even in healthy individuals, but its effect is amplified in asthma.

3. Circadian Decrease in Epinephrine
Epinephrine (Adrenaline, a natural bronchodilator) is lowest during early morning hours. Low levels mean:

- Less bronchodilation
- Greater airway tone
- Increased reactivity to triggers

This is one of the strongest biochemical contributors to nocturnal asthma.

4. Cooling of the Airways
Breathing cooler air during sleep lowers airway temperature, causing:

- Reflex bronchoconstriction
- Increased airway reactivity

This effect is more pronounced in cool bedrooms or in mouth-breathers.

5. Supine Position
Lying flat can worsen airway physiology because:

- Mucus clearance decreases
- Postnasal drip increases
- Blood volume shifts toward the chest
- Persons with Gastroesophageal Reflux Disease GERD) at night adds another irritant.

6. Bedroom Allergen Exposure
Common nighttime allergens may be present for a significant length of time and include:

- Dust mites
- Pet dander
- Mold
- Feather bedding
- Older carpeting

Prolonged exposure can increase airway inflammation.

7. Reduced Beta-2 Receptor Sensitivity
Between 2–6 AM, airway smooth muscle becomes less responsive to beta-agonists:

- Bronchodilators are less effective
- Rescue inhalers may provide less relief

This reduced response may explain more severe nighttime symptoms.

8. Sleep-Related Apnea or Hypoventilation
Even minor oxygen drops during sleep can:

- Activate airway irritant receptors
- Trigger hyperresponsiveness
- Increase bronchoconstriction reflexes

Co-morbid obstructive sleep apnea worsens nighttime asthma control.

Other Contributors Causing Within-Day Variability
There are other factors that contribute to within-day variability in spirometry testing **beyond workplace exposures** and the eight (8) asthma factors discussed above that apply to healthy people and those with lung disease. These include, but are not limited to:

a. Fluctuations in bronchial mucus volume due to hydration status (thickens secretions), humidity, frequency of coughing, and changes in ciliary activity.
b. Changes in testing position (i.e., standing v sitting v supine)
c. Consumption of large meals is well known to decrease FEV_1, due to gastric distention (diaphragmatic elevation) and worsening of gastroesophageal reflex.
d. Variability in respiratory muscle strength which can vary due to fatigue or recovery. This can be more pronounced in those with lung disease.
e. Initial broncho dilation during and briefly after exercise, followed by exercise induced bronchoconstriction, 5-20 minutes later.
f. Caffeine intake, which is a mild bronchodilator.
g. Use and timing of bronchodilator medications.
h. Recent cigarette causing airway irritation and possible acute bronchoconstriction.
i. Stress and anxiety. This can lead to broncho-dilation due to sympathetic activation. High stress can cause hyperventilation changing intrathoracic pressures.
j. Acute changes in environmental (non-workplace) exposures. These can include brief walks outside due to fluctuating pollen counts that can cause changes among susceptible individuals in airway tone within short periods of time. Other causes can be due to release of airborne irritants during preparation of foods (i.e., cooking), cleaning agents, etc.
k. Changes in ambient temperature. Cooler air increases bronchoconstriction, while warmer air relaxes airway tone.
l. Electronic drift with spirometry testing equipment.

Practical Implications for Spirometry
Asthma has a stronger circadian pattern than normal subjects, explaining why many attacks occur between 2–6 AM and this effect may linger while at work. For workplace spirometry testing, it is generally recommended to schedule tests at a similar time of day for annual monitoring. In addition, testing technicians should pay attention to the factors listed above that contribute to within-day variability. Reducing within-day variability, improves comparability with previous

testing, especially when asthma status is unknown. The ATS/ERS 2019 Spirometry Technical Standards emphasize consistency in testing conditions, including time of day, when repeat measurements are compared over time. While exact timing is not mandated, maintaining similar conditions helps ensure accuracy and reproducibility of results. When this can't be done, the testing technician should communicate factors that may be causing variability in test results.

The bottom line is:

- Lung function varies with circadian rhythm, especially in asthmatics.
- Nighttime physiology increases airway narrowing and reactivity.
- Many other factors contribute to within-day variability that apply to healthy people as well as those with lung disease.
- Workplace spirometry should aim for consistent timing to minimize variability.

Why Accurate Spirometry Interpretation Demands More Than a Computer Algorithm

Many spirometry devices used in workplace and primary care settings rely on outdated, opaque algorithms that often fail to meet current clinical guidelines. These computerized interpretations rarely disclose their source or date, overlook test quality, and reduce complex respiratory patterns to simplistic labels like "obstructive" or "restrictive." Worse, they seldom indicate the direction or magnitude of error when results are sub-optimal. That's why it's critical for health professionals to go beyond merely accepting a computer-generated statement.

NIOSH-approved spirometry training programs focus on testing technique, calibration checks, and criteria for acceptability and repeatability, not interpretation. While they offer limited exposure to basic patterns, they do not equip attendees to recognize the wide range of abnormal results that may require physician follow-up. This gap underscores the need for specialized training in interpretation.

Coal Workers' Pneumoconiosis Deaths

The December 18, 2025 edition of the CDC Morbidity and Mortality Weekly Report (MMWR) reported new findings for Coal Workers Pneumoconiosis deaths in the U.S.. Since this is of potential interest to readers of my respiratory protection and pulmonary function testing newsletters, I've included it in both. A copy of the abstract is provided below:

> Coal workers' pneumoconiosis (CWP) is a preventable, progressive occupational lung disease caused by inhaling respirable coal mine dust, a complex mixture commonly containing coal, crystalline silica, and other silicate minerals. Early pneumoconiosis can be asymptomatic, but advanced disease often leads to disability and premature death. To describe CWP-associated mortality among U.S. residents aged =15 years by industry and occupation, CDC conducted an exploratory analysis of National Vital Statistics System multiple cause-of-death data for 2020–2023, the most recent years that include information on decedents' usual industry and occupation. During 2020–2023, CWP was listed on the death certificate of 1,754 decedents (age-adjusted CWP-associated death rate = 1.3 per 1 million). By industry group, the highest number of CWP-associated deaths occurred among workers in the mining industry (1,255). The highest proportionate mortality ratios (PMRs) were among persons employed in the mining industry (PMR = 50.0) and the construction and extraction occupations (6.2). Among workers employed in the mining industry, the highest PMR was among underground mining machine operators (164.6). The continuing occurrence of CWP-associated deaths underscores the potential value of a comprehensive prevention program (maintaining efforts to control occupational coal mine dust exposures, combined with early disease detection efforts and medical care) and supports potential benefits of ongoing surveillance.

Source: Mazurek JM, Dodd KE, Syamlal G, Blackley DJ, Weissman DN. Coal Workers' Pneumoconiosis–Associated Deaths — United States, 2020–2023. MMWR Morb Mortal Wkly Rep 2025;74:627–633. DOI: http://dx.doi.org/10.15585/mmwr.mm7441a1
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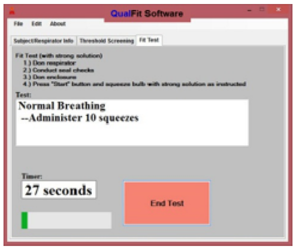

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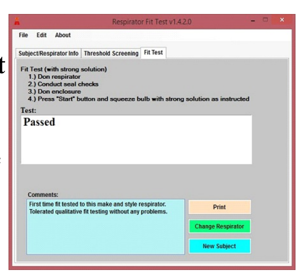


2026 Spirometry Training Course Schedule

The University of Cincinnati is pleased to announce the remaining training course schedule that may be of interest to you or your staff. They are:

NIOSH-Approved Spirometry (initial course):
Mar 24-26, 2026
June 16-18, 2026
Sept 15-17, 2026
Nov 10-12, 2026

Spirometry Refresher (NIOSH-approved):
August 25, 2026
Also available online

Interpretation of Spirometry - Beyond the Numbers:
August 26, 2026

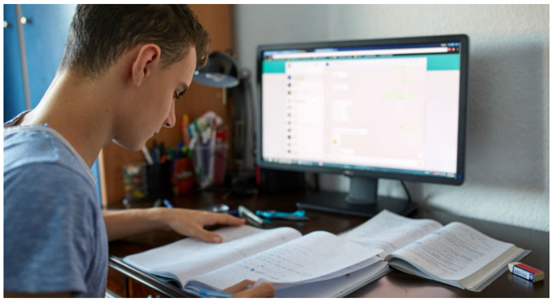
Online Spirometry REFRESHER Training (NIOSH-approved):
This online, self-paced course fulfills requirements for NIOSH-Approved Spirometry **Refresher** training necessary for compliance with some OSHA standards.
To receive a course brochure, email Roy@DrMcKay.com
For a brief 2 minute Video Description:
https://youtu.be/uu8UQ0j-S9E

Online Fundamentals of Spirometry:
This interactive online, self-paced course is designed to teach essential spirometry testing procedures consistent with current ATS-ERS spirometry guidelines.
To receive a course brochure, email Roy@DrMcKay.com
Click here for information, fees, or to submit a registration request

Spirometry Refresher Reminder

If your last NIOSH-approved spirometry training course was taken in **2021**, you're due for a refresher in **2026**. Currently, a 7-month grace period is in effect to renew your NIOSH Spirometry certificate. Therefore, re-certification must be completed within 5 years and 7 months of your previous course date.

Online Spirometry Training Courses



Online Spirometry REFRESHER Training (NIOSH-approved):

This online, self-paced course fulfills requirements for NIOSH-Approved Spirometry **Refresher** training necessary for compliance with some OSHA standards. Course content was developed by Dr. McKay (University of Cincinnati) and includes the most recent changes to ATS-ERS spirometry standards. Upon successful completion of this course, students will receive a NIOSH-Approved Spirometry **Refresher** training certificate.

To receive a course brochure, email Roy@DrMcKay.com or Click Here

Click here for information, fees or to submit a registration request

For a brief 2 minute Video Description: **https://youtu.be/uu8UQ0j-S9E**

Online Fundamentals of Spirometry:

This interactive online, self-paced course is designed to teach essential spirometry testing procedures consistent with current ATS-ERS spirometry guidelines. It includes; terminology, how to administer a test, testing technique, acceptability/repeatability criteria, how to read tracings, and much more. This course is designed for persons who plan to conduct spirometry testing in an office, clinical and some occupational health settings. It can help prepare respiratory therapists taking the RPFT exam and occupational health nurses taking the COHN exam. It is **not** a replacement for persons who need a NIOSH-approved spirometry training certificate. To receive a course brochure, email Roy@DrMcKay.com or Click Here

Click here for information, fees, or to submit a registration request

In-person Training opportunities

NIOSH-Approved Spirometry Training

This 3-day "initial" training course is designed for persons who need to learn how to administer spirometry testing according to the most recent 2019 ATS/ERS guidelines. This “hands-on” training covers all aspects of spirometry testing and uses a combination of lecture, hands-on training and small group problem solving sessions.

Next NIOSH-approved Spirometry course dates:
- Mar 24-26, 2026
- June 16-18, 2026
- Sept 15-17, 2026
- Nov 10-12, 2026

Certificates for persons that successfully complete all training requirements will indicate 22 contact hours with 2.2 CEUs from the University of Cincinnati.

Spirometry Refresher NIOSH-approved

Refresher training is **required every 5-years** for testing technicians who wish to maintain their current NIOSH-approved training status. Refresher training is also recommended by the American Thoracic Society (ATS), European Respiratory Society, and other organizations. This one-day course will be given by Roy McKay, Ph.D., a contributing author to the previous ATS/ERS Spirometry standard used worldwide. This Refresher course reviews the most recent spirometry testing guidelines, spirometry patterns (flow & volume), methods to improve testing technique, occupational surveillance concerns, and basic spirometry patterns. Examples of acceptable or usable, and unacceptable tracings will be shown to help the student recognize if the tracing has usable versus acceptable information. This course is also an excellent way to obtain answers to questions not foreseen during initial training and maintain your NIOSH-approved certification status.

Partial Listing of Course Topics

* Changes to spirometry standards.
* Definitions & Significance of: FVC, FEV_1, $FEF_{25-75\%}$.
* Review and improve proper test procedures and subject preparation.
* Recognition of unacceptable maneuver performance.

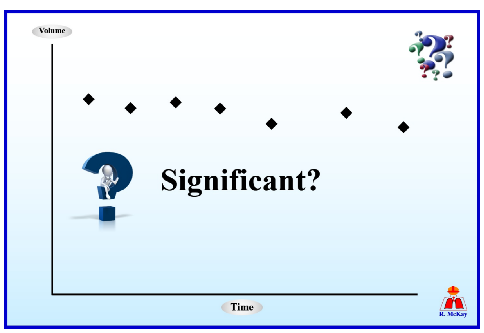
* How to identify an improperly performed test.
* How to use the Flow - Volume display to improve test performance.
* How to use Peak Flow to evaluate subject effort.
* How to recognize obstructive & restrictive patterns.
* Recognition of artifacts that impact patient test results (e.g., zeroing errors, sub-maximal effort, etc.)
* Methods you can use to improve test quality.
* Understanding the display and equipment recorder requirements of the ATS/ERS.

Our refresher class is not a repeat of initial spirometry training. It's specifically designed to meet the needs of students who have previously attended a spirometry training program in the past.

Our next in-person Spirometry **Refresher** class will be held:

August 25, 2026

For additional information, visit our web site at: www.DrMcKay.com



Evaluating Change in Spirometry?

Are you curious if spirometry tests on a worker or patient have a significant change in lung function? Need an expert opinion? Calculations using percent change and other methods are notorious for producing false positive and false negative results. Most methods lack reliable criteria to distinguish true change from normal aging and/or variability. Calculating FEV$_1$Q has serious limitations and lacks a recognized endpoint. If you have five (5) or more test dates, Dr. McKay can perform an expert independent analysis using multiple models, rather than relying on a single model. A straightforward answer, along with tabular and graphic displays, are included with a simple to read report and expert opinion. Depending upon available data, analysis can include calculations evaluating potential for peripheral airway collapse, not detectable using FEV$_1$ alone. For additional details, email Dr. McKay at roy@drmckay.com and request additional information.

Interpretation of Spirometry: Beyond the Numbers

This annual, 1-day comprehensive course is designed for health professionals who want to **master** the art and science of spirometry interpretation. If you've ever wondered why relying on the "three best tracings" leads to errors, or how to spot subtle patterns others miss, this course is for you.

You'll explore **multiple interpretative strategies**, including the 2022 ATS/ERS guidelines, while uncovering their omissions and inconsistencies. We'll also review other approaches (Gold-Hardie, NLHEP, NICE, ACOEM) and the most recent revision to **Dr. McKay's Spirometry Interpretation Algorithm© 2024**, the only comprehensive algorithm consistent with spirometry guidelines.

Through **hands-on practice problems**, you'll learn to identify and understand patterns such as:

Upper, central, lower, early and small airway obstruction
Restrictive and mixed disorders
Artifacts from sub-maximal effort

We'll show you **when to ignore misleading measurements**, how to extract usable data from imperfect maneuvers, and how to recognize poor technique or subject effort. You'll also gain clarity on concepts like **FEV1Q, PRISm, SADI, and dysanaptic patterns**. Practical methods to identify potentially significant change in lung function will be presented. This information is helpful in regards to identifying persons with true lung disease versus variability in the test.

By the end of the day, you'll be equipped to:

Reduce false positives and negatives in diagnosing obstructive, restrictive, and other patterns
Interpret spirometry with confidence - even when results aren't perfect
Apply strategies that improve clinical decision-making

This course is a must for anyone seeking a deeper understanding and practical mastery of spirometry interpretation.

Objectives:

Recognize important components of spirometry standards that impact interpretation of results.
Interpret spirometry graphs as to the type of pattern.
Recognize conditions that affect spirometry results.
Identify errors in test procedures or testing equipment that may affect results.
Recognize factors that cause miss-classification of spirometry patterns (i.e., obstructive to normal, etc.).
Recognize potentially significant change in

spirometry testing.
Understand new concepts including **FEV1*Q*** and **PRISm**.

All students attending this program will receive a copy of Dr. McKay's Spirometry Interpretation Algorithm©

For a complete listing of course content, please visit: www.DrMcKay.com

Next course date is: August 26, 2026

2026 Respirator Training Schedule
Respirator training dates for calendar year 2025 have set as follows. Class size is limited. If interested, submit a registration request early. Payment is not required to submit a registration request, but space is assigned when payment is received. To submit a request or for additional information, go to: www.DrMcKay.com

Overview of Respiratory Protection:
April 21 & October 27
Fit Testing Workshop (2-day):
April 22-23 & October 28-29
Respirator Selection & Cartridge Change Out Schedules
May 12-13
Fit Testing Refresher & Advanced Topics
May 14, 2026

For information about **QualFit**™ Software© for qualitative respirator fit testing with sweet and/or bitter agents, go to www.QualFit.net

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There is no cost to subscribe. Your email address is NOT given to any other source. Newsletters are sent 2 - 3 times per year.

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We hope to see you at a future training course.

Roy McKay, Ph.D.
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