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## Why should you perform spirometry in your office?

### 1. **Your Office sees patients with indications for spirometry** (See Indications for Spirometry)

According to the Centers for Disease Control (CDC), COPD is now the third leading cause of death in the U.S.A.

Of the top three which include heart disease and cancer, COPD is the only disease that is increasing in prevalence rather than decreasing.

The number of Americans with COPD is estimated at 24 million, but only half of them have been diagnosed with the disease. There is one death every four minutes, more than breast cancer and diabetes combined.

According to the Allergy and Asthma Foundation of America, every day in America:

- ✓ 40,000 people miss school or work due to asthma;
- ✓ 30,000 people have an asthma attack;
- ✓ 5,000 people visit the emergency room due to asthma;
- ✓ 1,000 people are admitted to the hospital due to asthma;
- ✓ 11 people die from asthma;
- ✓ 1 out of 4 American will die from asthma and allergies.

### 2. **Office spirometry is cost effective and generates revenue** (See CPT Codes)

Office spirometry is third party reimbursable with an average reimbursement of \$35 for a simple five minute noninvasive test.

The average primary care physician performs 10 tests per week and pays for their equipment in two months or less.

### 3. **Equipment ease of use**

Unless the equipment is easy to use, it will not be fully utilized by your staff.

All Micro Direct spirometers are menu driven via a large graphic display and the test takes less than five minutes to perform.

The equipment performs all of the calculations, test quality control checks, and provides a confirming diagnostic interpretation.

### 4. **All Micro Direct spirometers are backed by a 30-day money back guarantee and supported by our team of spirometry experts.**

Only Micro Direct offers nine different models priced from \$395 to \$2,395 and the expertise to help you choose the right spirometer and to fully support your staff from proper testing technique through billing questions.

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## Indications for Spirometry

Spirometry was first introduced into clinical medicine in 1846 by John Hutchinson. Hutchinson not only designed the first spirometer but also designated the expiratory vital capacity and developed the original normal standards. He deduced that the measurement of a patient's vital capacity could be used to trace, define, and diagnose respiratory and circulatory disorders.

Since then, spirometry has been used extensively to measure lung function capability and to recognize and treat many diseases associated with the impairment of healthy lung functions. Spirometry today provides great insight into the status of any person's health.

Generally speaking, spirometry is a simple diagnostic tool used to define a subject's lung condition. The major indications for spirometry are:

- ✓ To evaluate symptoms, signs or abnormal laboratory tests (i.e. dyspnea, chronic cough, chest tightness/cough during exercise, frequent colds)
- ✓ To measure the effect of disease on a pulmonary function.
- ✓ To assess therapeutic interventions (i.e. bronchodilator or steroid treatment, management of CHF, etc.)
- ✓ To assess preoperative risk
- ✓ To screen individuals at risk of having pulmonary diseases (i.e. smokers, obesity, occupational exposures)
- ✓ To assess the prognosis of a disease
- ✓ To assess health status before enrollment in strenuous physical activity programs
- ✓ To assess patients as part of a rehabilitation program
- ✓ To assess risks as part of an insurance evaluation
- ✓ To assess individuals for legal reasons (i.e. Social Security disability, personal injury lawsuits, etc.)

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## CPT Codes\*

The current Procedural Terminology (CPT) codes defined below are the most common used to describe spirometry procedures performed with the Micro Direct spirometers.

CPT CODE	TEST DESCRIPTION
94010	<b>Spirometry Complete</b> , includes graphic record total and timed vital capacity, expiratory flow rate measurement(s) with or without maximal voluntary ventilation
94060	<b>Bronchodilation Responsiveness</b> , spirometry as in 94010, pre- and post bronchodilator or exercise
94070	<b>Bronchospasm Provocation Evaluation</b> , multiple spirometric determinations as in 94010, with administered agents (e.g. antigen(s), cold air, methacholine).
94375	<b>Respiratory Flow Volume Loop</b>
95070	<b>Inhalation Bronchial Challenge Testing</b> , (not including necessary pulmonary function tests), with histamine, methacholine or similar compounds.
94664	<b>Bronchodilator Administration</b> , demonstration and/or evaluation of patient utilization of an aerosol generator, nebulizer, meter dose inhaler or IPPB device.

Many Medicare Part B carriers have published Local Medical Review Policies (LMRP) that describe specific coverage guidelines for spirometry procedures. For definitive coverage and payment information, contact your local Part B carrier.

\*The material referenced and provided is based upon research current at the time of printing. The final decision of billing for any product or procedure must be made by the provider of care, considering the medical necessity of the services and supplies provided, the regulations of insurance carriers and any local, state or federal laws that apply to the supplies and services rendered. We are providing this information in an educational capacity with the understanding that we are not engaged or rendering legal, accounting or other professional services or advice.

Note that applicable laws, rules and regulations may change. While we will use reasonable efforts to update the guide regularly, this guide should not be relied upon as a current or comprehensive statement of all applicable laws, rules and regulations.

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## ICD-9 Diagnosis Codes

Diagnosis	ICD-9-CM Codes
Smokers over 40	491.0
Shortness of Breath	518.82
Chronic Cough	464.4, 493.9
Frequent Coughs	460 or 465, 465.0, 465.8, 465.9
Allergic Rhinitis	506, 506.0, 506.1, 506.2, 506.3, 506.4, 506.9
Occupational Exposure to Dust or Chemicals	506, 506.0, 506.1, 506.2, 506.3, 506.4, 506.9
Scoliosis	737, 737.0, 737.1, 737.10, 737.12, 737.19, 737.2, 737.20, 737.21, 737.22, 737.29, 737.3, 737.30, 737.31, 737.32, 737.33, 737.34, 737.39, 737.4, 737.40, 737.41, 737.42, 737.43, 737.8, 737.9
Pigeon Chest	738.3, 754.82
Barrel Chest	783.3
Diagnosis of Asthma	493, 493.0, 493.1, 493.2, 493.9
Diagnosis of Bronchitis	491, 491.0, 491.1, 491.2, 491.8, 491.9
Diagnosis of other COPD	496
Pre-Operative Evaluation	518.5
Wheezing	786.09
High Risk Medication	V58.69



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## Information Provided by the Spirometer

The standard spirometry maneuver is a maximal forced exhalation (greatest effort possible) after a maximum deep inspiration (completely full lungs). Micro Direct spirometers offer over 30 indices along with graphic representation which includes a volume-time curve and a flow-volume loop. The following indices are the most important indices according to the ATS/ERS standards:

- FVC** Forced Vital Capacity. Total volume of air forcefully exhaled between the maximal inspiration and maximal expiration. Simply how much air a person can force out of their lungs. This number is displayed in liters.
- FEV<sub>6</sub>** Forced Expiratory Volume at Six Seconds. Volume of air exhaled in the first full six seconds of the maneuver. It is a more recently derived value to help in patients with more severe airflow obstruction. These patients have difficulty and often stop before full exhalation therefore the severity of airway obstruction may be underestimated therefore the FEV<sub>6</sub> is used instead of the FVC.
- FEV<sub>1</sub>** Forced Expiratory Volume at One Second. Volume of air exhaled in the first full second of the maneuver. Simply how much air a person can force out of their lungs in the first second. This number is shown in liters.
- FEV<sub>1</sub>/FVC** Ratio of the FEV<sub>1</sub> to the FVC. Percentage of the total volume (FVC) exhaled in the first full second (FEV<sub>1</sub>). Also known as FER or FEV<sub>1</sub>%.
- FEF<sub>25-75%</sub>** Mid Expiratory Flow Rate. Average flow rate over the middle portion of the maneuver. Least effort dependent and may indicate small airway obstruction. Also known as MMEF.

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## How to Perform a Spirometry Test

### Before starting an FVC test session:

Ensure that the patient is fully prepared: posture (sitting is recommended); removable false teeth have been removed; tight clothing is loosened and proper instruction on the test is given - including a demonstration by the operator. Fit a new SpiroSafe filter, MicroCheck mouthpiece or regular cardboard mouthpiece and finally fit a disposable nose clip (optional).

The FVC test can be performed using two methods. Give and demonstrate instructions to the subject so that testing is performed properly:

#### Method 1 - Single Breath FVC (recommended):

1. Inhale as deeply as possible with the transducer well away from the mouth, insert the mouthpiece, clamping it between the teeth and closing the lips around it to create a perfect seal.
2. Exhale as hard and fast as possible for as long as possible.
3. Optionally at the end of expiration, inhale fully.

#### Method 2 - Multi Breath FVC:

Insert the mouthpiece, clamping it between the teeth and closing the lips around it to create a perfect seal.

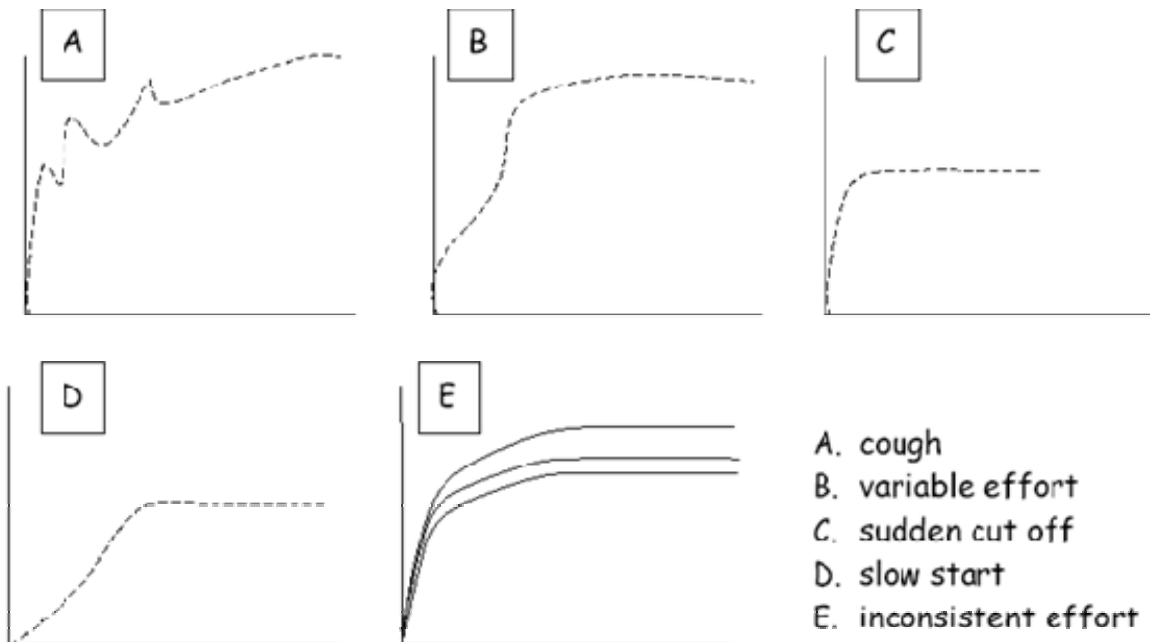
1. Breathe in and out normally through the transducer. This is tidal breathing.
2. When happy that the subject has achieved steady tidal breathing, continue
3. Exhale as much as possible
4. Inhale as much as possible (speed is not important) and when fully inhaled
5. Exhale as hard and fast as possible for as long as possible.
6. Optionally, return to tidal breathing.

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The Micro Direct spirometers will display the graphs and provided a blow quality to assist you in determining if the effort is acceptable.

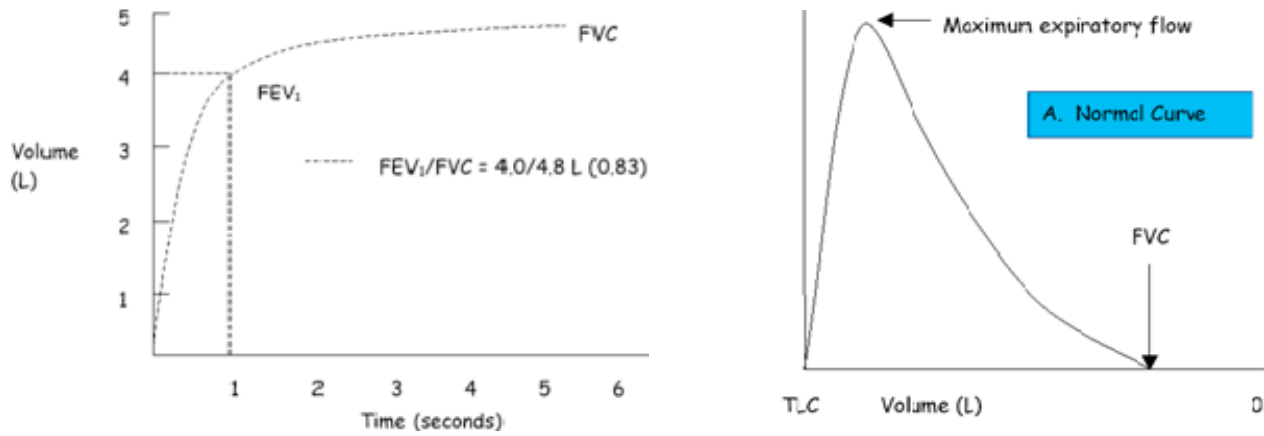
With either method, the procedure should be repeated at least twice until three acceptable and repeatable blows are obtained. The best two of these readings should be within 150 mL or 5% of each other and best. The Micro Direct spirometers will display a message once this criterion has been achieved.

### Examples of Poorly Performed Test



## Examples of Spirometric Graphs

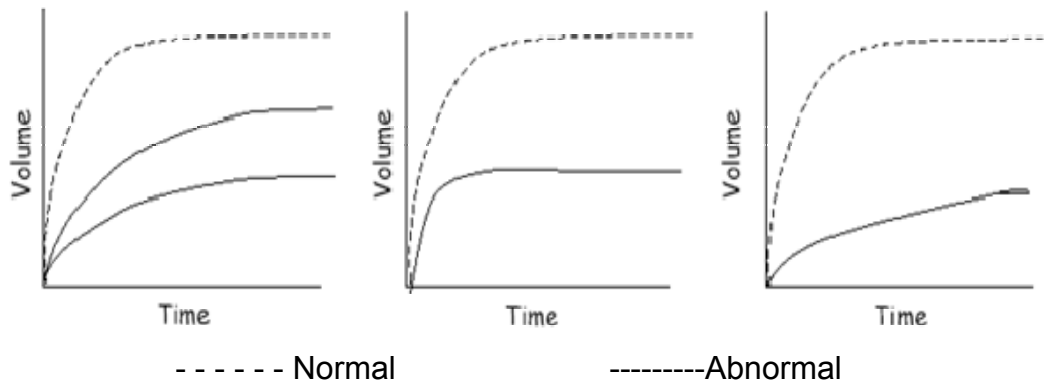
Normal Spirograms



Obstruction

Restriction

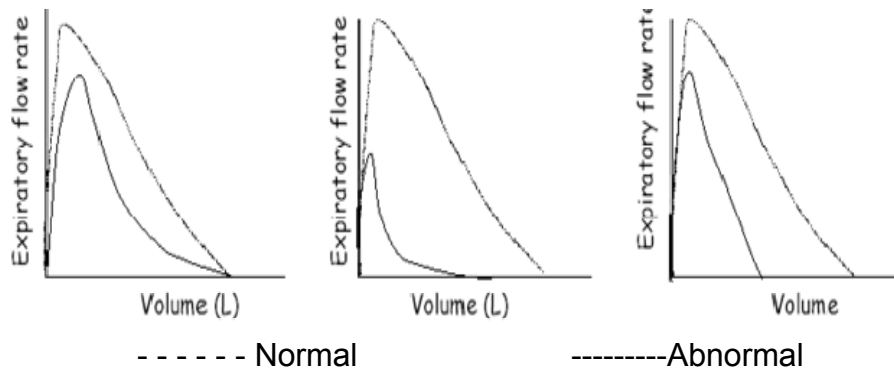
Mixed



Obstruction

Severe Obstruction

Restriction



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## **Need Additional Information or Support**

Micro Direct has been the spirometry leader in the USA for over 15 years and our customer service and spirometry knowledge is second to none.

Please contact us and we would be happy to assist you in any way we can.

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# Spirometry Solutions from Micro Direct

## Your Spirometry Specialist

### MicroLab (ML3500-S) Desktop



- ❖ Digital Volume Transducer
- ❖ Touch Screen Color Display
- ❖ Real Time FV Loop or VT Curve
- ❖ Child Incentive (3 available)
- ❖ Internal or 8 1/2" x 11" Printout
- ❖ 44 Test Parameters Available
- ❖ 2,000 Patient Test Memory
- ❖ Pre/Post Bronchodilator Comparison
- ❖ Diagnostic Interpretation
- ❖ Choice of Predicted Values
- ❖ On-Screen Help Menu
- ❖ Lung Age Estimation
- ❖ Spirometry PC Software Included
- ❖ ATS Quality Checks
- ❖ Meets ATS/ERS Standards
- ❖ 2-Year Warranty

**\$2,395**

### MicroLoop (ML3535-S) Hand Held



- ❖ Digital Volume Transducer
- ❖ Touch Screen Color Display
- ❖ Real Time FV Loop or VT Curve
- ❖ Child Incentive (3 available)
- ❖ 8 1/2" x 11" Printout (PC or Direct)
- ❖ 44 Test Parameters Available
- ❖ 2,000 Patient Test Memory
- ❖ Pre/Post Bronchodilator Comparison
- ❖ Diagnostic Interpretation
- ❖ Choice of Predicted Values
- ❖ On-Screen Help Menu
- ❖ Lung Age Estimation
- ❖ Spirometry PC Software Included
- ❖ ATS Quality Checks
- ❖ Meets ATS/ERS Standards
- ❖ 2-Year Warranty

**\$1,995**

### Alpha Touch (MD6550) Desktop



- ❖ Accurate Fleisch Pneumotach
- ❖ Touch Screen Color Display
- ❖ Real Time FV Loop or VT Curve
- ❖ Child Incentive (2 available)
- ❖ Internal or 8 1/2" x 11" Printout
- ❖ 52 Test Parameters Available
- ❖ 10,000 Patient Test Memory
- ❖ Pre/Post Bronchodilator Comparison
- ❖ Diagnostic Interpretation
- ❖ Predicted Values: NHANES III
- ❖ On-Screen Help Menu
- ❖ Lung Age Estimation
- ❖ PDF Report Software Included
- ❖ On-Screen Test Quality Prompts
- ❖ Meets ATS/ERS Standards
- ❖ 1-Year Warranty, 5-Year Optional

**\$2,150**

### In2itive (MD7900) Hand Held



- ❖ Accurate Fleisch Pneumotach
- ❖ Touch Screen Color Display
- ❖ Real Time FV Loop or VT Curve
- ❖ Child Incentive (2 available)
- ❖ 8 1/2" x 11" Printout (PC)
- ❖ 52 Test Parameters Available
- ❖ 10,000 Patient Test Memory
- ❖ Pre/Post Bronchodilator Comparison
- ❖ Diagnostic Interpretation
- ❖ Predicted Values: NHANES III
- ❖ On-Screen Help Menu
- ❖ Lung Age Estimation
- ❖ Spirotrac V PC Software Included
- ❖ On-Screen Test Quality Prompts
- ❖ Meets ATS/ERS Standards
- ❖ 1-Year Warranty, 5-Year Optional

**\$1,750**

### Alpha (MD6500) Desktop



- ❖ Accurate Fleisch Pneumotach
- ❖ Color High Resolution Display
- ❖ Real Time FV Loop or VT Curve
- ❖ No Child Incentive
- ❖ Internal or 8 1/2" x 11" Printout
- ❖ 13 Test Parameters
- ❖ 9 Patient Test Memory
- ❖ Pre/Post Bronchodilator Comparison
- ❖ Diagnostic Interpretation
- ❖ Predicted Values: NHANES III
- ❖ On-Screen Help Menu
- ❖ Lung Age Estimation
- ❖ PDF Report Software Included
- ❖ On-Screen Test Quality Prompts
- ❖ Meets ATS/ERS Standards
- ❖ 1-Year Warranty, 5-Year Optional

**\$1,850**

### SpiroUSB (ML2525) PC-Based



- ❖ Digital Volume Transducer
- ❖ Computer Screen Display
- ❖ Real Time FV Loop or VT Curve
- ❖ Child Incentive (4 available)
- ❖ 8 1/2" x 11" Printout
- ❖ 44 Test Parameters Available
- ❖ Memory (PC Capacity Dependent)
- ❖ Pre/Post Bronchodilator Comparison
- ❖ Diagnostic Interpretation
- ❖ Choice of Predicted Values
- ❖ On-Screen Help Menu
- ❖ Lung Age Estimation
- ❖ Spirometry PC Software Included
- ❖ On-Screen Test Quality Prompts
- ❖ Meets ATS/ERS Standards
- ❖ 2-Year Warranty

**\$1,595**

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