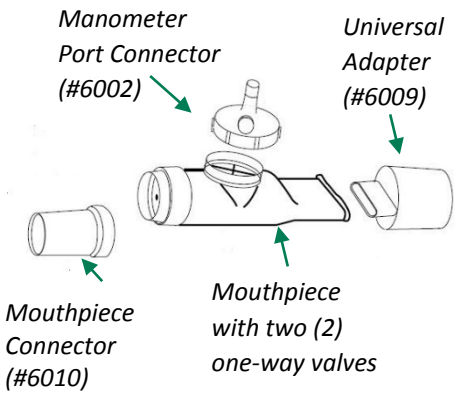
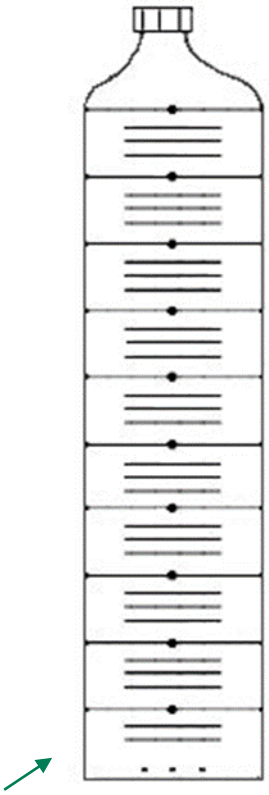
Technical Bulletin

Disposable Spirometer (REF 6600)

Product Description:

The Disposable Spirometer Kit (Ref 6600) includes a transparent 10-liter calibrated collection bag, mouthpiece connector, valved-mouthpiece, universal adapter and manometer port connector. The one-way valves on the mouthpiece allow the patient to inhale air through the intake port and exhale through the exhalation valve into the collection bag.





10 Liter Collection Bag (#6400)

Intended Use

The Salter Labs Disposable Spirometer is intended to be used to measure pulmonary variables associated with screening and monitoring patients, and for weaning patients from ventilator support. The Disposable Spirometer can be used to measure tidal volume (V_T), expired tidal volume (V_E), vital capacity (VC), forced vital capacity (FVC) and VC/FVC). This is a disposable, single-patient use device.

Device Set Up

Some of the tests may require a nose clip to control the pathway of the inhaled or exhaled air. In order to facilitate use, the nose clip may be affixed to the patient before commencing measurements.

If the patient is incoherent, use a mask that covers the nose and mouth.

If the patient is on a ventilator, use the universal adaptor to attach the Disposable Spirometer directly to the appropriate instrument port (may vary depending on the type of circuit and the maneuver being performed). NOTE: Do not leave the Disposable Spirometer on the exhalation manifold unattended or in any way be allowed to restrict the patient's exhalation.

Patient Instruction

The patient needs to be conscious and able to follow instructions. Prior to testing, explain to the patient what breathing tests are being performed. Inform the patient that the tests are effort dependent, but should not cause any undue discomfort.

Product Use

The following application procedures are for a patient who is alert and able to follow instructions. Modify the procedure as necessary for less responsive patients and for patients on a breathing assist device (ventilator).

Tidal Volume (V_T) Measurements

V_T may be determined by measuring the gas inhaled or exhaled during a single normal breathing cycle. It is recommended to take the average of 10 breath cycles to minimize measurement errors. For this test, a nose clip should be used.

1. Assemble the Disposable Spirometer. Insert mouthpiece into the collar on the collection bag and ensure all connections are tight.
2. Position the nose clip (not included in the kit) on the patient's nose.
3. Instruct the patient to insert the mouthpiece into their mouth and use their lips to maintain an adequate seal around the mouthpiece.
4. Instruct the patient to take 10 normal breaths. The patient should inhale and exhale through the mouthpiece.
5. Remove the nose clip and mouthpiece with collection bag.
6. Encircle your fingers around the collection bag and move distally from the mouthpiece and until a slight resistance is noted. Note the scale marking and corresponding value on the collection bag.
7. The volume in liters (ATPS) is read directly from the scale. Divide this number by 10 for an estimated V_T. This determination may be converted to BTPS if desired.

Minute Ventilation (VE) Determination:

VE is measured with the same technique as used for VT, except exhaled air (gas) is collected for 1 minute.

1. Assemble the Disposable Spirometer. Insert mouthpiece into the collar on the collection bag and ensure all connections are tight.
2. Position the nose clip (not included in the kit) on the patient's nose.
3. Instruct the patient to insert the mouthpiece into their mouth and use their lips to maintain an adequate seal around the mouthpiece.
4. Instruct the patient breath normally for one minute. The patient should inhale and exhale through the mouthpiece.
5. After one minute, remove the nose clip and mouthpiece with collection bag. Encircle your fingers around the collection bag and move distally from the mouthpiece and until a slight resistance is noted. Note the scale marking and corresponding value on the collection bag. The volume in liters (ATPS) is read directly from the scale. This determination may be converted to BTPS if desired.

Note: If the patient has a large tidal volume or if the respiratory rate is high, the exhaled volume may exceed the bag's capacity. If this occurs; empty the bag and after a brief rest, repeat the procedure for 30 seconds and multiply the collected volume by 2.

Vital Capacity (VC) Determination:

The VC is measured similar to the V_T method. The patient is asked to slowly inhale a maximum breath (deep breath) and then slowly exhale as completely as possible. Note: The test may be helpful in determining the effectiveness of pursed lip breathing by noting whether or not the patient can exhale more completely (greater collected volume) if he uses pursed lips during exhalation.

1. Assemble the Disposable Spirometer. Insert mouthpiece into the collar on the collection bag and ensure all connections are tight.
2. Position the nose clip (not included in the kit) on the patient's nose.
3. Instruct the patient to insert the mouthpiece into their mouth and use their lips to maintain an adequate seal around the mouthpiece.
4. Instruct the patient to slowly take a deep breath and then slowly exhale as completely as possible.
5. Remove the nose clip and mouthpiece with collection bag.
6. Encircle your fingers around the collection bag and move distally from the mouthpiece and until a slight resistance is noted. Note the scale marking and corresponding value on the collection bag. The volume in liters (ATPS) is read directly from the scale.
7. Let the patient rest and repeat test 2 more times. Record the largest volume (best effort) of the 3 breaths.

Forced Vital Capacity (FVC) Determination:

The FVC test is performed similar to the vital capacity measurement except the patient is instructed to exhale as forcibly and as quickly as possible.

1. Assemble the Disposable Spirometer. Insert mouthpiece into the collar on the collection bag and ensure all connections are tight.
2. Position the nose clip (not included in the kit) on the patient's nose.
3. Instruct the patient to insert the mouthpiece into their mouth and use their lips to maintain an adequate seal around the mouthpiece.
4. Instruct the patient to slowly take a deep breath and then forcibly exhale as quickly and completely as possible.
5. Remove the nose clip and mouthpiece with collection bag.
6. Encircle your fingers around the collection bag and move distally from the mouthpiece and until a slight resistance is noted. Note the scale marking and corresponding value on the collection bag. The volume in liters (ATPS) is read directly from the scale.
7. Let the patient rest and repeat test 2 more times. Record the largest volume (best effort) of the 3 breaths.

VC/FVC Determination:

Have the patient conduct a vital capacity and forced vital capacity test following the procedures listed above. The ratio is obtained by dividing VC by FVC. This provides a quick estimate of the trapped inhaled air.

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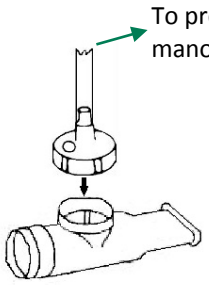
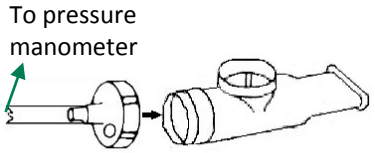
Inspiratory and Expiratory Pressure Determinations:

Pressure measurements require connection between a pressure monitor (electronic, mercury manometer or mechanical) and the port connectors (part #6002) supplied with the Disposable Spirometer.

1. Snap the port cap on to the top of the mouth piece for inspiratory pressure or onto the end of the mouth piece of expiratory pressure measurements.
2. Apply the nose clip to patient.
3. Instruct the patient to slowly exert a maximal effort to inhale or exhale. The respective pressure may be read directly from the monitor.
4. Repeat the procedure 3 times. Have the patient rest between each trial.
5. Record the best of the three efforts.



Inspiratory Pressure Measurement



Expiratory Pressure Measurement

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