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# Spirometry and Lung Function Interpretation

Practical 08 / Teaching laboratory

## Aim

Obtain a technically acceptable supervised spirometry demonstration and interpret the flow and volume data.

## Principle

FEV1 is the forced expiratory volume in the first second. FVC is forced vital capacity. An abnormally low FEV1/FVC supports airflow obstruction when effort and quality criteria are met.

## Materials and Requirements

- Spirometer, approved filters and quality records
- Instructor screening checklist and reference equations
- Supplied curves if a volunteer is unsuitable

## Procedure

1. Check identification, age, height and reference basis. Screen for contraindications and verify the equipment check.
2. Enter age, standing height and other data required by the reference set. Verify the calibrated device, single-use mouthpiece or filter and a seated position. Use simulated traces when participation is unsuitable.
3. Coach a maximal inspiration and prompt sustained exhalation using the device protocol. Record the effort and curve quality.

Continue with step 4 on the next page.

# Procedure Continued

Spirometry and Lung Function Interpretation

4. Demonstrate a nose clip and firm mouth seal. Coach a full inspiration followed without delay by a fast, forceful start and continued exhalation under the instructor's stopping rule.
5. Compare acceptable manoeuvres and assess repeatability under the applicable technical standard.
6. Review the volume-time and flow-volume curves for cough in the first second, leaks, hesitant start or early termination. Retain the manoeuvres meeting the adopted quality criteria.
7. Provide recovery time and repeat with coaching to obtain acceptable, repeatable efforts under the lab standard. Record the best reportable FEV1 and FVC and the quality grade or limitations.
8. Calculate the ratio and review it against the appropriate lower limit of normal and the curve shape.
9. Divide FEV1 by FVC and compare with the supplied lower limit of normal. A low FVC with a preserved ratio warrants review of technique and lung volume data before assuming restriction.

## Precautions

- Use infection control and pause when symptoms occur.
- Avoid interpretation of unaccepted or poorly repeated manoeuvres.

# Observations and Interpretation

Spirometry and Lung Function Interpretation

## Observations and Record

| Item | What to record | What it tells you |
|---|---|---|
| FEV1 and FVC | Litres, manoeuvre quality and reference basis | Assess individual results |
| FEV1/FVC | Observed ratio and lower limit of normal | Supports or argues against obstruction |
| Curve quality | Cough, early termination or poor start | Marks interpretation limits |

### Worked Example

Teaching data FEV1 2.40 L and FVC 3.20 L give 0.75 or 75%. Interpret against an appropriate reference and check acceptability before classifying the pattern.

## Result and Interpretation

Record quality and values before stating a pattern. A low FVC alone does not establish restriction.

## Viva Questions and Answers

### What confirms a restrictive ventilatory defect?

A reduced total lung capacity on appropriate testing.

### Why see the flow-volume curve?

It helps detect technical faults and supports pattern interpretation.

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