Spirometry Quality Assurance Manual for General Practice

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Part 1 – INTRODUCTION

Obtaining good spirometry depends on routine preventative maintenance.

This manual is a guide for an ongoing program of maintenance that includes regular calibration checks, cleaning and verifying that your equipment is operating correctly, so that you can be confident that you have an accurate and reliable spirometer.

It is recommended that you refer to your user manual in the first instance for manufacturer's recommendations regarding cleaning and calibration proceduresappropriate to your instrument.

IMPORTANT

It is recommended that mouthpieces used for spirometry are at least disposable and preferably have a one way valve or a filter, to prevent cross infection.

Alternatively, purchasing extra turbines/ pneumotach/ transducers so that they can be cleaned and dried in between patients. This allows for adequate drying time between uses.

Part 2 – CLEANING FOR SPIROMETERS WITH TRANSDUCERS/TURBINE/PNEUMOTACHS

Warning: Check the user manual cleaning advice specific for your spirometer first as these procedures may not be suitable.

Cleaning Solution

- **Check the user manual for cleaning product advice for your spirometer.**
- **An enzymatic cleaner such as Medizyme (3ml in 500ml water) should be used.**
- **The manufacturer of some spirometers suggests that for cold sterilizing, Cidex, Totacide 28 can be used however due to OHS concerns these must not be used in usual primary care settings.**
- **Alcohol and chlorine solutions should be avoided.**

Procedure

- **Check the user manual for cleaning procedure advice for your spirometer.**
- **Disconnect the transducer/turbine/pneumotach holder from the spirometer.**
- **Remove the transducer/turbine/pneumotach from the transducer/turbine/pneumotach holder, gently.**
- **Immerse the transducer in the cleaning solution for 10 minutes.**
- **Gently agitate the transducer/turbine/pneumotach in the cleaning solution and then remove.**
- **Rinse in cold running water.**
- **Wash transducer/turbine/pneumotach, using detergent, and the rinse again in running water.**
- **Place transducer/turbine/pneumotach on towel on bench, and leave to completely dry in the air (do not wipe dry).**

Frequency of cleaning

- **Assuming a disposable barrier filter is used for <u>each</u> patient, it is suggested that the spirometer is cleaned as needed or at least monthly**

Part 4 – DATA ENTRY WORKSHEET

Year		**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**July**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**
Cleaning													
Volume check 3L syringe													
Slow FVC	1												
	2												
	3												
Fast FVC	1												
	2												
	3												
Volume check Subject 1													
Best FEV_1													
Best FEV													
Best FEF_{25-75} (MEF)													
Best PER													
Volume check Subject 2													
Best FEV_1													
Best FEV													
Best FEF_{25-75} (MEF)													
Best PER													
QC satisfactory (Y or N)													
Initials													
Date													

Record of cleaning as part of this Quality Control Program

- **Record in the table below the dates on which the Spirometer was cleaned using the above procedure:**

Date	Cleaning completed (Y or N)	Initials of person Cleaning equipment

Part 3 – FLOW/VOLUME CALIBRATION CHECK

A. USING A 3 LITRE SYRINGE

A 3L syringe is used as if it was a patient to check the measured volume. Insert fictitious 'patient' details and prepare to perform an FVC maneuver.

2 step procedure:

Firstly SLOW maneuver:

- **Using a 3 litre syringe as the subject, slowly push this volume of air through the Spirometer, and record the reading obtained.**
- **Repeat this step two more times, to obtain a total of three readings**
- **Record these readings on the Data Entry Worksheet (next page)**
- **The readings must fall in the range 2.91 to 3.09 litres.****

Secondly FAST maneuver:

- **Using a 3 litre syringe as the subject, quickly (at flow rates of between 5 and 10 litres per minute) push this volume of air through the Spirometer, and record the reading obtained**
- **Repeat this step two more times, to obtain a total of three readings**
- **Record these readings on the Data Entry Worksheet (next page)**
- **The readings must fall in the range 2.91 to 3.09 litres.**

****Note: The American Thoracic Society recommendations for volume accuracy are ±3% or 0.5L, whichever is greater.**

For a 3 litre syringe, this means that the acceptable range of readings would be between 2.91 and 3.09 litres

B USING SUBJECT

Procedure

The same member/s of staff should be tested as the subject for quality control purposes. This means that the Subject must be a member of staff who can regularly assist with this task and who has normal lung function.

- **Perform a minimum of 3 technically acceptable Forced Vital Capacity maneuvers (to American Thoracic Society Standards) and record the best measurements in the Data Entry Worksheet (next page)**

If the calibration check fails, the pre-set calibration can be altered. However, you need to be confident that you understand what you are adjusting.

See instructions in spirometry manual specific to your spirometer.

If you do not feel confident to adjust the pre-set calibration, or the calibration check fails again, hence the Quality Control results are not satisfactory, then contact your supplier or company that provided the spirometer.

Part 6 – MAINTENANCE RECORD SHEET

Use the table below to record any problems that have arisen with the Spirometer, and also record how these problems have been rectified. System hardware and software upgrades can also be recorded here.

This will allow other members of staff to refer to these details at a later date.

Date	Problem	Solution	Initials

Part 7 – RECORD OF FREQUENCY OF QUALITY CONTROL CHECKS

Date	Comment	Initials

Part 8 – AMERICAN THORACIC SOCIETY GUIDELINES

AMERICAN THORACIC SOCIETY GUIDELINES

Standardization of Spirometry – 1994 Update

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