



## Spirometry (and other Lung Function) Testing during COVID-19 PROTOCOL

### Key Messages:

- Only tests that will inform key diagnostic or management decisions should be done
- No one acutely sick or within 2 weeks of COVID exposure should be tested
- Careful attention to strict infection control and PPE; book less patients, space them to avoid clustering and allow time between tests.
- Tidal breathing measures (oscillometry, FeNO, MBW) are less aerosolising than spirometry and are safer. Consider using where appropriate to your clinical question
- Avoid bronchial provocation and exercise testing

### Background:

#### ***Lung function testing in children during COVID-19 pandemic and beyond***

The following is merely a ***recommendation for performing lung function testing during the COVID-19 pandemic***. ***Transmission of Corona virus is through droplets***: aerosolised droplets or contaminated surfaces. During lung function testing procedures (LFTs) transmission can occur via aerosolised respiratory secretions, during cough, forced exhalation and/or sneezing. LFTs therefore pose a considerable risk for the spread of infection to individuals and surrounding surfaces within and around the test areas even in asymptomatic patients. Since the ***safety of our patients and staff*** (see below) is of paramount importance, additional ***safety precautions during the testing are recommended***. Therefore;

- (a) time needed for testing will increase,
- (b) more consumables will be needed,
- (c) personal protective equipment (PPE) must be notable and
- (d) patient flow during their diagnostic workup will be slower/take longer.

COVID-19 poses a potential risk to all patients attending lung function services (as well as the staff working there), as it circulates in the community.

- The local prevalence of the virus will dictate the level of safety precaution that must be applied.
- The prevalence will restrict testing to those that most require it and limit the availability of testing e.g. exercise testing is not recommended.



Safety measures for lung function testing are based on the prevalence of COVID-19 in the community as follows:

Pandemic phase	High community prevalence	Level 1 safety recommendations
Post Peak phase	Low community prevalence	Level 2 safety recommendations
Post Pandemic phase	Controlled	Level 3 safety recommendations

## Recommendations:

### (1) Level 1 safety - for Pandemic Phase 1

During high prevalence of the virus in the community, referring personnel must carefully consider the safety of staff and cross-contamination of equipment; therefore, testing will be restricted to patients requiring **urgent / essential tests only for immediate diagnostics of current illness affecting management decisions.**

**NO patients with symptoms of COVID-19 or flu like symptoms are to be tested under any circumstances at this time. Postpone all routine testing during this phase of high community prevalence. A patient who had COVID must not be tested for a minimum of 30 days post infection and/or 7 days post cessation of symptoms.**

The following strategies are to be followed to limit the risk of transmission.

### Organisational

- All patient referrals to be screened by pulmonologist and only patients for essential tests will be booked for testing
- Triage patients carefully for COVID-19 status at referral and on arrival for testing. Any symptomatic patient or patient with a symptomatic household contact will NOT be tested (screening sheet to be done on arrival attached)
- If possible, confirm recent SARS-COV-2 test.
- Patient and only one carer should be encouraged to come at booked appointment time. They must be instructed to wear masks at all times and sit a minimum of 1.5 meter from the next person in the waiting room.
- Testing room should be organised to minimize transmission: open window (or negative pressure ventilation), minimise clutter to facilitate effective surface wiping in between patients.



- Reorganise testing schedules to include extra time for post-test cleaning/decontamination procedures of the surfaces of the test equipment and environment, to ventilate the room for at least 15 minutes (open windows, close doors) and for PPE donning and doffing. Recalibrate PFT equipment after decontamination. An extra 30-60min is hence required.
- Ensure that all PPE is available and appropriate bins for doffing are in room and are cleaned at end of testing day.

#### Testing and equipment

- Test procedures should be limited to Spirometry, Diffusing capacity and Oscillometry. Other tests such as exercise or challenge tests should be avoided at this stage. Bronchodilator response (BDR) testing should only be done if key to diagnosis and management.
- Ideally use tidal breathing measures e.g. oscillometry in preference to aerosolising test such as spirometry.
- Equipment should be wiped down with disinfectant between each patient test.
- Test should always be carried out with a high specification disposable in-line bacterial and viral filter in place (recommend filters with minimum proven efficiency for high expiratory flow of 600 to 700 L/min).
- Maximise the use of single use consumables and dispose of the items with care.
- Where reusable items are utilised, they should be managed carefully e.g. nose clips, spacers, rubber mouthpieces, etc. should be cleaned as recommended by local infection control policy.
- Ideally, patients should bring their own bronchodilator and spacer if a BDR is to be performed.

#### Protection of staff performing LFTs

- Personal protective equipment is necessary in all circumstances. Use of PPE in high risk areas must be managed within the same space and staff should not move outside the area without removing the PPE.
- PPE should be N95 masks, eye protection e.g. goggles or face shield.
- Disposable gloves should be used at all times when testing. These should be discarded after each patient and new gloves should be used for cleaning the surfaces before being also discarded.
- Hands must be washed after removing gloves, after touching any surfaces in the testing room and last thing after doffing.
- If doing spirometry, technologist should ideally leave the room whilst waiting to complete BDR after administering bronchodilator; also for 20min in between patients (the latter is not necessary if negative pressure ventilation or ventilation with HEPA-filter).



### Cleaning and infection Control

- Use of masks for all patients attending for tests; hands sanitized or 20 sec wash before entering room for test
- Regular equipment cleaning protocols should be adhered to. The equipment and testing surfaces should be wiped down between patients. At the end of testing the room should air for 20min and then be thoroughly cleaned.
- Adequate room ventilation (negative pressure in testing areas if available)
- Maintain strict adherence to the 5 golden rules, patient and staff, at all times: maintain physical distance, keep your mask on (except when doing test!), cough into your elbow or immediately discarded tissue, sanitise or wash hands thoroughly or regular and DON'T come for test if you feel unwell.

### **(2) Level 2 safety - for Post Peak Phase**

In this phase of disease prevalence, the pre-test probability of infection is lower than in the pandemic phase but still requires significant safety measures. Therefore, the essential procedures of infection control, organisational recommendations should stay the same as in Level 1.

The following is be recommended in the post peak phase:

#### Testing and equipment

- All testing procedures can be reintroduced
- Exercise testing, bronchial challenge tests, and other aerosol generating procedures should be limited to specific equipment and testing rooms.

### **(3) Level 3 safety - for Post Pandemic Phase**

Full operation of lung function services should only resume when viral prevalence is low and reliable testing based on a combination of symptom screening and testing is readily available.

These recommendations are adapted from the statement endorsed by the European Respiratory Society (assembly 9 and 4) on lung function testing during the time of the COVID-19 pandemic

[http://s3.amazonaws.com/mgcdiagnostics/Product\\_Images/Product\\_Images/ERS\\_Statement\\_on\\_PFTs\\_in\\_COVID-19.pdf](http://s3.amazonaws.com/mgcdiagnostics/Product_Images/Product_Images/ERS_Statement_on_PFTs_in_COVID-19.pdf)



## Appendix 1. Triage questionnaire for S20:

Patient sticker	Spiro Y/N	BDR Y/N	<u>Important notes:</u>
<b>Vital and epidemiological data:</b>	<b>YES</b>	<b>NO</b>	<b>Comment:</b>
- Pyrexia (fever)			Body Temperature:
- Cold/Flu-like symptoms			
- Cough			Days: Weeks: Months:
- Dizziness/Fatigue			
- Diarrhoea/Nausea/Vomiting			
- Conjunctivitis			
- Sore Throat			
- Abnormalities in taste/smell			
- Family history of- or respiratory illness in last 14 days			
- Has patient/care giver been in contact with someone Covid-19 positive			
- Does the patient/care giver stay/work in an environment prone to Covid-19 cases			
- Other			
<b>COVID-19 Swab Result (if available)</b>	<b>Positive</b>	<b>Negative</b>	