

Safe use of spirometry in primary healthcare settings

Infection prevention and control

Spirometry is a common lung function test used to monitor and diagnose lung and airway conditions. This factsheet includes practical strategies to help reduce the risk of infection transmission during spirometry testing.

What is spirometry

Spirometry is a non-invasive test commonly used to diagnose and/or monitor respiratory conditions, such as asthma, chronic obstructive pulmonary disease (COPD), cystic fibrosis and interstitial lung diseases such as pulmonary fibrosis. Other indications for spirometry include breathlessness and chronic cough.

Spirometry measures the volume of air a person can inhale and forcefully exhale. Spirometry is not considered to be an aerosol-generating procedure. However, up to half of patients cough during or after spirometry, which has the potential to generate respiratory droplets.¹

Minimising the risk for infection transmission during spirometry

Healthcare workers should assess patients with upper or lower respiratory tract symptoms (e.g. nasal congestion, pharyngitis, cough, wheeze, shortness of breath) for infection risks before spirometry, and take appropriate action to reduce risk of infection transmission. The use of in-line bacterial/ viral filters and HEPA filters may also minimise the risk of infection transmission during testing.^{1,2}

In situations where a respiratory infection is suspected or confirmed, the use of spirometry should be delayed.

If the test cannot be delayed, healthcare workers should implement [transmission-based precautions](#) in addition to [standard precautions](#). For more information on standard and transmission-based precautions, see the [Australian Guidelines for the Prevention and Control of Infections in Healthcare](#) and the [Royal Australian College of General Practitioners. Infection prevention and control guidelines for general practices and other office-based and community-based practices](#).

Risk assessment

The risk assessment should identify if there are any infection risks and should consider potential outcomes if others are exposed to a respiratory infection during testing. Some points to consider include:

1. Does the person undergoing spirometry have symptoms or a recent history of respiratory infection?
2. If the person has a respiratory infection, would it be clinically appropriate to delay spirometry until the infection is resolved?
3. Who is at risk of exposure to respiratory particles during the test? Do they have an increased susceptibility to infection?
4. Is the environment suitable for performing spirometry? For example, can the door be closed during testing? Is there an opening window or HEPA filter?

Risk management

The following strategies can be used to prevent or reduce the risk of infection transmission.

Using standard precautions

[Standard precautions](#) should be used by all healthcare workers providing care to all patients, at all times, regardless of known or suspected infections. Standard precautions include:

- [hand hygiene](#) – always clean your hands before and after any patient contact, after handling equipment and at the end of a patient consultation
- [personal protective equipment](#) (PPE) – a surgical mask and protective eye wear or a face shield will protect the face and eyes from respiratory particles or droplets generated by spirometry-associated coughing
- asking the patient to:
 - cough into their hands or a tissue and provide a bin for waste and access to hand hygiene products to clean their hands after coughing, or
 - wear a surgical mask, which is lowered to the chin during testing, then replaced immediately after testing is complete
- [equipment and environmental cleaning](#) – clean all reusable equipment and environmental surfaces with neutral detergent solution or wipes, followed with a disinfectant, if required between each test. Dispose of all single use items immediately.^{3,4}

Environmental controls

Ideally, spirometry should be performed in a well-ventilated room that is closed off to other internal spaces and involve only one patient at a time. If the person undergoing spirometry testing needs a support person, the support person should be provided with appropriate PPE.²

If the ventilation is poor (e.g. split system air conditioning, no opening windows, no HEPA filters), and testing must be done despite suspected respiratory infection, consider standing the room down for about 60 minutes after spirometry.^{1,4}

Vaccination

Healthcare workers are at risk of occupational exposure to vaccine-preventable diseases. Vaccination against seasonal influenza, COVID-19, pertussis and other respiratory infections reduces a person's risk of infection from these diseases. See the [Australian Immunisation Handbook](#) for more information on recommended [vaccinations for healthcare workers](#).

Key points for the safe use of spirometry in primary healthcare settings

- Delay spirometry testing if respiratory tract infection is suspected
- Use an in-line bacterial/viral spirometry filter
- Consider mitigations for spirometry-associated cough:
 - use a surgical mask and eye protection
 - ask the patient to wear a surgical mask;
 - place a medical grade air cleaner (HEPA 13 or 14 filter) in the area used for spirometry testing
- Wipe down equipment and surfaces after test
- Keep your immunisation status up to date for vaccine-preventable diseases.

References

1. British Thoracic Society, [Risk minimisation in spirometry re-start](#), 2021
2. National Asthma Council Australia. The spirometry handbook for primary care. Melbourne; National Asthma Council Australia: March 2023.
3. National Health and Medical Research Council, Australian Commission on Safety and Quality in Health Care, (ACSQHC). Australian Guidelines for the Prevention and Control of Infection in Healthcare. Canberra: 2019.
4. The Royal Australian College of General Practitioners. Infection prevention and control guidelines for general practices and other office-based and community-based practices. 5th ed. East Melbourne, Vic; RACGP: 2022.

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