Guidelines for infection prevention and control for people with CF in non-health care settings: CFNZ position statement intended for people with CF and their family / whanau

Adopted by the CFNZ Board March 2019

The goal of this position statement is to educate people with CF and their caregivers, family and whanau about the potential risks of acquiring and/or transmitting respiratory tract pathogens. This includes people post-lung transplant.

It is intended to raise awareness and help people with CF make informed choices in their personal lives. **This applies to the non-healthcare setting**.

It is intended to provide guidance for the CF community in NZ and should not be interpreted as a binding document. **Infection prevention and control in the healthcare setting is not specifically addressed** here because that is the domain of the CF centres healthcare providers.

This document draws heavily on the consensus documents and guidelines published by the CF Foundation in the USA, the UK CF Trust and CF Australia.

Background

Lung disease remains the predominant source of morbidity and mortality for people with cystic fibrosis (PWCF). It is characterised by recurrent infection with various respiratory tract pathogens. Whilst we do not fully understand the mode of acquisition of many CF pathogens, data has emerged over the past decade that strongly suggest infection can be acquired from both the environment and other PWCF.

Chronic infection with some of these pathogens such as *Pseudomonas aeruginosa, Burkholderia cepacia complex, Methicillin resistant Staphylococcus aureus (MRSA)* and *Mycobacterium abscessus* can have significant health implications and is associated with poorer clinical outcomes and reduced survival.

Historically, PWCF were thought to acquire *Pseudomonas aeruginosa* from the environment. The potential for certain pathogens to pass from person-to-person in CF was first recognised in the late 1980s when patients attending the same CF centre were found to harbour the same strain of *Burkholderia cepacia* complex.

More compelling evidence of transmission followed, when patients were found to share strains of *B. cenocepacia* after attendance at CF camps. This was described at a number of CF centres and was associated with poorer outcomes. Subsequently

there has been increasing recognition that person-to-person transmission can occur with several common CF pathogens including (but not limited to) *Pseudomonas aeruginosa*, MRSA and Mycobacterium *abscessus.*

While these pathogens are renowned for their potential for patient-to-patient transmission, the CF scientific community now recognises that **any respiratory pathogen could be transmitted from person-to-person**.

Research has now confirmed that respiratory pathogens can be projected into the air with coughing and sneezing to a greater distance than originally recognised; data from Queensland show that PWCF can generate droplet nuclei containing *Pseudomonas aeruginosa* that are small enough to be inhaled by others (in the so called “respirable” range) and these droplets remains viable for up to 45 minutes and can be detected up to 4 metres from the source. They can exist in the air as aerosols and droplets (e.g. after coughing) or contaminate contact surfaces and potentially survive in the environment for hours.

In addition, while PWCF rarely carry the bacteria that typically cause chronic infection in CF, they can carry other bacteria (Streptococcus pneumoniae) or viruses (Respiratory Syncytial virus, influenza, adenovirus etc) that can cause respiratory tract infection in the community. Infection with these other common pathogens may have similar or even greater implications for PWCF leading to pulmonary exacerbations. These community bacterial and viral infections are transmissible between individuals *with or without* CF.

Previously, PWCF were asked to provide a recent sputum culture and sign a waiver in order to attend an event or conference for people with CF. However, there are no tests that will provide an absolute guarantee that a PWCF does not harbour a microorganism that is potentially transmissible, and this practice is no longer considered safe. The concept of “less threatening” bacteria is no longer accepted and all pathogens should be considered as potentially transmissible and universal precautions should be taken.

In view of the growing evidence that several different pathogens can be transmitted from person-to-person, strategies are needed to minimise the risk of acquisition of infection for PWCF attending any event that could be attended by another person with CF.

Methods of Transmission

There are a number of different potential routes of transmission of micro-organisms and these are summarised below. Particle size is used to categorise respiratory aerosols into droplets (> 5 µm) and droplet nuclei (< 5 µm). Droplet nuclei are a consequence of droplet evaporation and are capable of airborne transmission.

Direct contact

Person-to-person spread occurs with actual physical contact (touching). This includes intimate contact such as kissing or casual contact such as touching hands

that are contaminated with secretions (e.g. a handshake after covering the mouth with a hand during coughing).

Indirect contact
This involves contact with an object or surface that has been contaminated by secretions from an infected person (e.g. sharing eating utensils, respiratory equipment and toys) and contact with surfaces soiled by respiratory secretions.

Droplet route
This involves transmission of pathogens through the air in large particle droplets and can occur if a person coughs or sneezes and these droplets are inhaled by a non-infected patient in close proximity (i.e. within 2 metres). The droplets do not remain suspended in air for long, because of their large size.

Airborne route
Infection is transmitted by inhalation of pathogens on tiny droplets (droplet nuclei) which have been emitted from an infected person following a cough or sneeze. These tiny particles can remain suspended in air for a long time (at least 45 minutes) and carried substantial distances (4m or even further) thereby increasing the risk of them being inhaled.

Contact spread has been associated with transmission of *Burkholderia cepacia*, MRSA, *Pseudomonas aeruginosa* and respiratory viruses. Droplet spread is associated with transmission of *Burkholderia cepacia*, *Pseudomonas aeruginosa* and respiratory viruses. Airborne spread is thought to occur with respiratory viruses such as influenza. It is likely most respiratory pathogens can be transmitted by a combination of these pathways amongst people in confined spaces.

General hygiene measures for children and adults with CF

- Wash your hands using soap and water or waterless antiseptic hand wash (e.g. alcohol-based hand rub) before eating, after coughing or handling sputum or tissues and when using bathroom facilities. It is important to dry your hands thoroughly.

- Always cover your mouth and nose with your hand, inner elbow or tissue when you sneeze or cough. Throw away tissues immediately after use and wash your hands afterwards. Cough hygiene is very important to minimise contamination of the immediate surrounding environment.

- Do not leave sputum pots uncovered.

- Do not share eating or drinking utensils, drink cans, cups or bottles, toothbrushes or towels with others with CF.

- Do not share respiratory equipment (nebuliser, inhalers, spacers etc).

- Clean nebuliser and other equipment as recommended (refer to Cystic Fibrosis Clinical Guidelines on Starship website and CFNZ website).

- Infants and children with CF should avoid sharing toys.

- Avoid being in a confined closed poorly ventilated space (such as a car, hotel room) with another person with CF (unless they reside within the same household).

- If you have symptoms of a viral respiratory infection (e.g. runny nose, cold or influenza like illness) take particular care to follow the general hygiene measures above.

Household – for people with CF who live in the same household

- Practice general hygiene measures as above.

- Perform airway clearance techniques or chest physiotherapy in different rooms.

- Clean nebuliser and other equipment as recommended (refer to Cystic Fibrosis Clinical Guidelines on Starship website and CFNZ website).

Schools and preschools

- If more than one child with CF attends the same school/preschool, it is recommended parents share general information about CF infection prevention measures with staff.

- An individual plan will need to be developed between the family, the school staff and the appropriate health professional (e.g. CF nurse specialist, clinic nurse or CFNZ fieldworker).

- Informing staff may help to engage support for general hygiene practices, separation of children with CF into different classes (ideally need to be in separate classes) and with other measures such as taking enzymes at school. Staff can also inform parents of upcoming events such as gardening projects or building projects.

- For assemblies or other meetings where children with CF will be attending together, they should be separated from each other by sitting opposite ends of the room and be over 4 metres apart.

- If attending the same gym, they should attend separately with all equipment wiped in-between use with antibacterial wipes.

- Practice general hygiene measures as above.

- In general children with CF should be encouraged to play sport and undertake all the usual activities involved with schooling.

- People with CF are at risk of acquiring infection from certain environmental exposures; it is recommended that education outside the classroom activities are discussed in advance.
- People with CF do not represent an infection risk to other children.

PWCF are prone to chest infections which can be triggered by standard viral infection therefore general hygiene measures to limit the spread of viral infection should be encouraged in the classroom.

Workplace

Some work environments may pose specific risks to people with CF including but not limited to healthcare workers with CF. There are specific guidelines available that address the specific issues for consideration, and these should be referred to. Specific concerns relate to infection prevention and control measures in the workplace should be discussed with your CF care team.

Sports

Exercise is an important airway clearance technique and can improve lung growth through childhood as well as building fitness and improve mental health. Participation in sports has been identified as a risk factor for MRSA in non-CF sports participants likely due to skin contamination, abrasions, contact between players and poor hygiene.

- Sports events and team participation with non-CF team members is to be encouraged.

- Good hygiene around sports participation and sports equipment is encouraged.

- People with CF should avoid being in the same sports team or fitness class.

Pools

- Swimming at well-maintained (clean change rooms, chlorinated pools) swimming pools is encouraged.

- Paddling pools should be emptied and dried after use.

- Inflatable toys should be dried after use.

- Avoid putting fingers etc in the tepid drain areas.

- Spa pools are more difficult to maintain pathogen free with the warmer water temperatures and micro-organisms can grow in the pool and surrounds. This has been particularly associated with *Pseudomonas* and non-tuberculous mycobacteria. Swimming or bathing in spa pools poses a risk for people with CF and should be avoided.

Gardening

Potting soil can be a reservoir for non-tuberculous mycobacteria and Legionella. Aspergillus and other moulds can be grown from hay and other organic debris such as mulch. Burkholderia are known plant pathogens, notably onions and onion rot.

- Practice hand hygiene around gardening.
- Wear gloves for gardening.
- Wear a mask if using potting mix or mulch; avoid directly puncturing the bag (use the spade as opposed to hands) and wet the potting mix before pouring it out of the bag. In general, it is best to avoid potting mix exposure.

Pets and animals

While not especially described in people with CF, there have been a few reports of individual cases of Bordetella Bronchiseptica infection from sick pets, salmonella infections from reptiles and Mycobacterium marinum skin and soft tissues infections when cleaning fish tanks with breaks in skin.

Farm animals have been linked to transmission of viral infections to humans. Animal stalls, sheds and coops can become heavily contaminated with faecal flora. Aspergillus and other moulds can exist in hay and organic matter.

- Practice general hygiene measures – wash hands if contaminated with pet secretions, after cleaning cages, litters or beds.
- Don’t have aerated fish tanks in bedrooms and wear gloves if cleaning fish tanks.
- Get unwell pets treated early.
- Avoid cleaning stalls, pens or coops.

Healthcare worker with CF

There is limited guidance to support health care workers with CF in training and in employment to support safe practice and to provide protection for themselves and their patients from the acquisition of health care associated infection. A recent

position paper from Australia with a summary of the current literature and recommendations has been published (reference 5).

Events organised by CFNZ

There is no reliable way to completely prevent the risk of cross infection and the safest approach for patients with CF is not to attend CF related events. To reduce the risk of cross infection, the following recommendations are suggested:

Outdoor events

People with CF should not participate in “CF camps” or retreats involving more than one person with CF. Cross infection in these situations is difficult to avoid and there is strong evidence for person-to-person transmission of pathogens in these settings.

- If more than 1 person with CF attends an event, they should be separated by a distance of **at least** 4 meters.

- Observe good hand hygiene and cough etiquette. Dispose of used tissues in covered container.

- Avoid close contact with people (e.g. shaking hands, kissing) and do not share personal items such as drinking and eating utensils, cosmetics, soap bar.

- Avoid congregating in common areas (e.g. meal areas, elevators, restrooms), and avoid participating in common activities (e.g. face painting, meals at pubs or restaurants.

- Avoid traveling in the same vehicle (bus, car) as another person with CF, unless they live in the same household.

- Whether you have CF or not, it is important you do not attend the event if you are unwell with respiratory or gastrointestinal illness (including colds and flu).

Indoor events

The risk of person-to-person transmission is higher in enclosed spaces (e.g. cars, small rooms, elevators) and appears to be greater with epidemic strains of specific pathogens.

The precise risks of transmission of specific pathogens are not possible to quantify and the safest approach is for persons with CF not to attend the event.

- Only 1 person with CF should be present at an indoor event organised by CFA staff or regional volunteer branches, groups & committees.

- CFNZ will not support or promote non CFNZ indoor events where it is known that more than one PWCF is invited e.g. Christmas parties.

- Likewise, CFNZ will not actively promote the use of holiday homes offered to PWCF due to risk of infection through inadequate cleaning.

Future CF conferences and events

CFNZ realises how restrictive this is for PWCF and is actively investigating alternatives including social media, telephone support, webinars, online conferences, use of CFNZ website and Facebook.

CFNZ will seek feedback from PWCF on ways to actively engage, inform and educate PWCF.

References

This policy has been put together by the Clinical Advisory Panel, Cystic Fibrosis New Zealand

It is based on similar policies from:

1. **Cystic Fibrosis Foundation, USA 2014:** Saiman L et al*, Infection and Control Guideline for Cystic Fibrosis: 2013 Update*. Infection Control and Hospital Epidemiology 2014: 35 S1-S67.

2. **Cystic Fibrosis Trust, UK 2013: '***Cystic Fibrosis why we are here. Cross Infection Policy. Guidance for people with CF at events and meetings*'. CF Trust website www.cysticfibrosis.org.uk.

3. **Cystic Fibrosis, Europe 2013 '***Cystic Fibrosis conference/meeting anti-cross infection requirements for people with CF'*. www.cf-europe.eu

4. **Cystic Fibrosis Australia 2018** *Cross Infection Policy at Events 2018*.

5. Bell SC et al, *Work environment risks for health care workers with cystic fibrosis*. Respirology 2018; 12: 1190-1197.