

Infection Control Guidelines for People with Cystic Fibrosis (PWCF) outside of hospital.

Infection control sub-committee,
Medical and Scientific Committee,
The Cystic Fibrosis Association of Ireland.

August 2005

Aim and objectives of the guidelines

The aim of these guidelines is to reduce the probability of PWCF acquiring new bacterial infections with difficult to treat bacterial species.

The objective is to provide evidence based recommendations upon which individual PWCF can either assess themselves as a risk to other PWCF or that the risk of other PWCF present to them. In situations when such risk assessment is difficult for an individual, they should seek specific guidance from their CF physician and this may include consultation with this committee if required.

The guidelines are not intended to generate hysteria, create insecurity or lead to discrimination of individuals in CF society. It should be stressed that the success of any such guidance is very largely dependent on a high degree of understanding and adherence by not only PWCF but also their family, friends, work colleagues, healthcare workers and event organisers.

Background Principles

There is a strong recommendation to accept the principle that all PWCF have some type of bacteria in their respiratory secretions and that other PWCF may acquire these bacteria. There are three features of bacteria which are important to PWCF: virulence; antibiotic resistance; and transmissibility. Bacteria vary in the amount to which they respond to the commonly used antibiotics used to treatment, those that respond well to treatment are described as 'sensitive' and unresponsive types are described as 'resistant'. Similarly, many bacterial types are considered virulent because they are 'stubborn' and more difficult to treat, this does not necessarily mean they are resistant. Transmissibility relates to the ease with which a bacteria spreads from person to person or in the environment.

Three groups of bacteria will be considered special risks: all *Burkholderia cepacia* complex species; *Staphylococcus aureus* which are resistant to the indicator antibiotic methicillin (MRSA); and *Pseudomonas aeruginosa* which are known to be highly transmissible or epidemic. These are commonly accepted risk bacteria and are a minimum standard. It is accepted that many PWCF and their CF physicians may choose to include other bacteria in addition to these three groups addressed here. PWCF should not interact with other PWCF if unwell with an acute respiratory infection such as flu, tuberculosis etc. Similarly, PWCF should specifically avoid (non-CF) people with active respiratory infection.

The role of the CF physician is vital and central to care. This should properly include all aspects of infection control not only in hospital but equally in a patient's outside hospital activities where a risk of infection exists.

Key Risks

Standard precautions must apply at all times between PWCF. Many documents and publications are available to describe standard precautions in greater detail; key points to note include basic hand hygiene, using individual bathroom facilities and individual accommodation for sleeping/treatment.

With respect to socialising at CF related functions, the key risks are close physical contact, contact within conversational distance and prolonged duration of contact such as overnight functions under the same roof.

The implications are therefore relevant to National Conference, regional meetings, the Lourdes pilgrimages, Christmas parties or other events. It is important to emphasise and develop the possibility of participation in a non-contact way such as teleconferencing, web-based discussion fora, and parties or pilgrimages with non-CF organisations.

Microbiological Categories of infection risk

Although there is a large number of infectious agents with the potential to be transmitted from person to person this guidance will only address 4 groups:

- (1) Methicillin Resistant *Staphylococcus aureus*, (MRSA). This is a group of the bacterial species *Staphylococcus aureus* which are more resistant to some of the commonly used antibiotics used to treat them. Strains of this species which are resistant to methicillin are also resistant to many other useful antibiotics and this limits the choice of therapy when required. These organisms have caused cross infection within hospitals. Many CF centres segregate all their patients who have *Staphylococcus aureus*, even sensitive strains, from those who do not have this bacterial species and the committee respects this view and acknowledges the view that even the normal sensitive strains of *Staphylococcus aureus* may present a risk for PWCF. These guidelines are confined to the resistant strains, MRSA, on the basis that they are more difficult to treat. Ireland has a high prevalence of MRSA in hospitals compared to many other EU countries but recently they have been recognised in Ireland as being acquired outside of hospital and within the community. Many PWCF can be colonized with MRSA without signs of infection but it may cause clinical deterioration in some patients. Some strains are more “epidemic” or transmissible than others.

Recommendation: PWCF whose sputum is persistently MRSA positive should avoid meeting other PWCF.

- (2) *Pseudomonas aeruginosa* is the commonest bacterial pathogen in CF and may also be easily transmitted from person to person by airborne or more commonly by contact spread. Contact spread occurs when people are in contact with surfaces where the bacteria remains e.g. unsterilised equipment, bacterial residue on hands/skin, or food. Examples of contact spread are outlined below.

These bacteria may be associated with clinical deterioration and are commonly only sensitive to a very limited number of antibiotics, which must generally be given by blood (IV). Within this group of antibiotics some strains are resistant to several classes of antibiotics, (multidrug resistance), and some have total resistance to all antibiotics. Many countries have also recently shown some strains to be more easily transmissible than others (often called epidemic strains), although such strains are not routinely looked for in Ireland yet. There is a strong evidence base in some centres of easy transfer between patients. Due to the importance of avoiding acquisition of *Pseudomonas aeruginosa* it is advisable to separate individuals who have been identified with it from those without it. However, this may not be required if analysis within a centre has shown no predominant cross infection.

In the absence of such data many CF centres segregate all their *Pseudomonas aeruginosa* CF patients from those who do not have *Pseudomonas aeruginosa*. The recent US guidelines recommend segregation of only multidrug resistant strains of *Pseudomonas aeruginosa*, because the multidrug resistant bacteria are more difficult to treat. More recent CF Worldwide guidelines (2005) exclude any multidrug resistant bacteria from their international conference.

It is the view of this committee that these CFAI guidelines should refer to the known epidemic strains as described in the UK. However the Committee respects the view that people with CF should endeavour avoid the risk of contact with any type of *Pseudomonas aeruginosa*.

Examples of bacterial transmission by contact spread include: handshaking, hugging, kissing, contact with contaminated equipment, nebulisers, furniture or food. Whirlpool spas should be avoided especially if not strictly maintained but well chlorinated swimming pools are safe.

Recommendation: The Committee strongly advise those PWCF without *Pseudomonas aeruginosa* to avoid mixing at CF events where they may be exposed to PWCF with this bacteria.

It is also advised that PWCF whose sputum is persistently sputum positive with highly transmissible or epidemic strains to choose to avoid meeting other PWCF.

(3) *Burkholderia cepacia* complex organisms. These bacteria were formerly considered one species and are now known to be a group of 9 newly named species. Two of these species, *Burkholderia multivorans* and *Burkholderia cenocepacia* may be particularly associated with deteriorating lung function when present in CF sputum and are clearly infection control risks. They have caused numerous clusters of infection not only within one centre but also trans-continently between North America and Europe probably by PWCF attending CF summer camps.

In Ireland, the recent National *Burkholderia cepacia* complex prevalence Programme, sponsored by CFAI, has shown virtually all clinical types which have been identified to be within the two species mentioned above. However some reports in other countries have recently implicated some of the other species in this group as clinically relevant. The Committee therefore adopted the prudent principal to exclude any species in this group until our knowledge is clarified. The microbiological diagnosis of B cepacia complex bacteria must be confirmed by a reference laboratory. In Ireland a reference laboratory has been funded by the CFAI at Tallaght. This laboratory is happy to receive specimens from other laboratories.

Recommendation: PWCF if persistently sputum positive with any B. cepacia complex bacteria should avoid meeting other PWCF.

(4) Other potential pathogens. There is also a group of miscellaneous germs which may become more important as research advances but for some of these there is currently not enough known to support recommendations.

Developments of non-contact interaction

The psychosocial impact of exclusion from CF events should not be underestimated. Support from peers with chronic illness is vital to many people with CF. For the National conference and other events, the Committee urges development of facilities for electronic participation by either telephone audio facility, or full audiovisual communication of the conference presentations (both live and as stored webcasts) on the web site. Interaction via email and appropriate 'chat' facilities should be promoted. Day activities in the open air such as supervised/sponsored hill walking, where space is not confined and ventilation good, allows safe distance interaction among PWCF and could also be developed.

Microbiology Quality Control

The precision and accuracy of microbiology reports are very largely dependent on the quality of sputum sent to the laboratory. It is important that sputae, or cough swabs, are processed in an experienced CF Microbiology laboratory with a Consultant Microbiologist in attendance and using approved methods. This is particularly vital in the case of *Burkholderia cepacia* complex and epidemic *Pseudomonas aeruginosa* bacteria- in which case the identification of the bacteria must be confirmed by a reference laboratory using recognised molecular detection methods.

Definitions of colonisation, transmissibility and resistance

- Colonisation is defined as > 2 isolates within 6 months for *Pseudomonas aeruginosa* and MRSA and within 12 months for *B. cepacia* complex.

Some bacteria may sporadically or intermittently be reported in cultures and in these cases three consecutive negative respiratory cultures over a 6 month period should be required for a negative status.

PWCF should have their microbiological status checked at least at every annual assessment. All these specimens should be taken by a health care worker in a clinic for quality assurance of the specimen. If posted in to a laboratory from home, this should be under the supervision of the CF team.

- There is no universal acceptance of multidrug resistance but a recent US CF consensus defined the term as all antibiotics within 2 or more drug groups. The hospital CF team can interpret the sensitivities.

Some examples of anti-pseudomonas groups are (a) Beta-lactams (piperacillin, tazocin, ceftazidime, ticarcillin, timentin), (b) Aminoglycosides (tobramycin, gentamicin, amikacin), (c) Fluoroquinolones (ciprofloxacin), (d) Carbapenems (meropenem).

- Highly transmissible or epidemic CF bacteria are more prevalent and are associated with poorer prognoses and require more antibiotics than other strains of the same bacterial species. The most common *Pseudomonas aeruginosa* has been reported widely in the UK, (48% of centres), and increased transmissibility has been identified in one species of the *Burkholderia cepacia* complex. The identification of such epidemic strains requires reference laboratory analysis of marker genes in these bacteria.

Certification of pathogen free status

CF event organisers should ensure the infection control status of PWCF prior to the event. PWCF should discuss their infection control risk with their CF physician who can advise them on any current bacteria present in their sample or their risk of acquiring a new infection. At least one specimen should be within 28 days, approximately, of the event (IACFA guidelines www.cfww.org).

A letter confirming microbiological status should be signed by the CF physician and be required by the event organisers prior to attendance, (see sample letter in Appendix). Event organisers should complete the registration process for an event only when a satisfactory letter from the CF physician has been received. Procedures must be in place to allow for clarification from the physician if necessary. Adherence with this is essential.

Summary of Recommendations

- Standard precautions of infection control should be encouraged at all times
- PWCF should restrict contact with other PWCF
- Prior to a CF event, the microbiological status of sputum should be assessed in a laboratory with a Consultant Microbiologist and stated by a specialist CF physician
- The following groups should be discouraged from attending any indoor event with other PWCF: those persistently colonised with either
 - Methicillin resistant *Staphylococcus aureus*,
 - any species of *Burkholderia cepacia* complex or
 - Known highly transmissible or epidemic *Pseudomonas aeruginosa* and
 - Those who have never cultured *Pseudomonas aeruginosa*
- Encouragement of new communication technologies allowing non face-to-face conference participation should be supported.

This Committee is the Infection Control sub-committee of the Medical and Scientific Committee of the Cystic Fibrosis Association of Ireland. The current members are:

Ms. Patricia Duffy representing PWCF (adult group)

Ms Gerardine Leen, CF Nurse specialist, AMNCH, Tallaght, Dublin.

Dr. Mary Crowe, Consultant Microbiologist, St. Vincent's University Hospital, Dublin

Dr. Philip Murphy, Consultant Microbiologist, Adelaide Meath Hospitals incorporating the National Children's Hospital, Tallaght, Dublin

Appendix 1:

Specific event participation

National Conference

The National Conference is acknowledged as a vital event in the CFAI calendar. Key issues for consideration of venue include: large sized meeting rooms allowing a large volume of air and good ventilation, sufficient accommodation on site or in adjacent premises to allow individual en-suite sleeping accommodation, toilet facilities which are maintained at a hygienic standard. Pre- event registration should include the following recommendations:

‘Restrictions will be implemented for PWCF who apply for registration (as per bacterial status outlined below). PWCF should not share sleeping accommodation with other non-family PWCF, and are encouraged to use their own ensuite facilities rather than the hotel common toilets. PWCF attending day sessions only, probably have lower risks of acquiring infections from other PWCF compared to those attending the whole of the event/conference entirely under the same venue roof including sleeping, eating and socialising’.

These guidelines as applied to all CF events must include National conference. PWCF in the three risk categories are those persistently colonised with either

- methicillin resistant *Staphylococcus aureus*,
- any species of *Burkholderia cepacia* complex or
- highly transmissible or epidemic *Pseudomonas aeruginosa* and

should be discouraged from attending the Conference. The organisers should put in place arrangements to ensure these pathogens are unlikely to present a risk to other PWCF (e.g., PWCF who are *Pseudomonas aeruginosa* free). Prior to registration a written statement from the CF physician should specify the microbiological status with respect to infection control risk, (see appendix 2.) Participation for all PWCF by proxy should be promoted.

Pilgrimage to Lourdes

This presents particularly high risks to PWCF due to the prolonged exposure 5 day event and the in-flight confined air circulation. There is a strong evidence base of the transmission of many infectious agent during aircraft flight including TB, measles, influenzae and more recently SARS. This is thought to be due to very close proximity in-flight and only partial (10-50%) filtration of reconditioned air, which is forced down the sides of the cabin under pressure and then passes from passenger to passenger. There is a particularly high risk within 3 seat rows in front and behind an index infectious case. With respect to other non-CF organised pilgrimages, PWCF should also make themselves known to the pilgrimage organisers in case there are other PWCF attending that group. PWCF within the three risk categories should be discouraged from attending this pilgrimage as a collective group.

It is the recommendation of the Committee that a change of culture should be encouraged to recommend PWCF attend Lourdes with other groups and discourage a specific CF group pilgrimage. Consideration should be given to the promotion of single day events in the open air such as the Great Strides walks in the US.

Appendix 2

Sample letter from CF physician:

Reference

Date

To CF event organisation administration,

This letter is a statement that,..... has had regular sputum samples tested for bacterial culture and that most recently in the last 6 months their sputum was negative for:

- methicillin resistant *Staphylococcus aureus* (MRSA),
- all species of the *Burkholderia cepacia* complex and
- known epidemic *Pseudomonas aeruginosa*

The laboratory used for this analysis uses selective B. cepacia agars with prolonged incubation times and is under the direction of a Consultant in Medical Microbiology.

I understand that a culture should be negative, as above, within 1 month of participation in a CF event outside hospital to fulfill infection control guidelines of the Cystic Fibrosis Association of Ireland.

Yours faithfully,

.....
CF Physician.

Note: Exclusion criteria differ from those required by CF Worldwide (2005).

Appendix 3: Practical Infection Control advice for PWCF outside of hospital

The committee endorses the practical advice given in the CF Trust (UK) publications e.g., *Burkholderia cepacia* 1999, *Pseudomonas aeruginosa* infection in PWCF 2001. Specifically activities can be categorised as high or low risks e.g.,

Activity shared with other PWCF	Risk of transmission
Brief encounters outdoors	low
Close social contact -evenings in the pub or restaurant	High
Handshaking	High
Contact involving CF siblings	High
social kissing	High
travelling together in closed conditions eg car or lift	High
Sports or exercise classes	High
sharing eating or drinking utensils	High
intimate contact - kissing, sexual relationship.	High

Similarly with the advice of the CF Foundation (US) website, (www.cff.org), such as the webcast “How to avoid germs in CF” by Professor Lisa Saiman, 12th Jan 2004 and the document “Stopping the spread of germs” 2003.

The IACFA hygiene guidelines published in Summer 2003 Future Force are good advice. (www.cystic-l.org/handbook)

- Wash hands frequently especially after contact with respiratory secretions
- Use single use disposable paper tissues
- Avoid handshaking hugging or kissing - a touch on the arm or shoulder is a substitute.
- Avoid < 3 feet proximity in a confined space
- Avoid prolonged (e.g. >10 hours) total exposure periods at CF meetings
- Consider day attendance only
- Encourage alcohol hand rub (50ml handy bottle).