CF Foundation
Infection Prevention and Control Guideline for Cystic Fibrosis:
2013 Update

Recommendations for healthcare professionals

Infection Prevention and Control Guideline for Cystic Fibrosis: 2013 Update. Lisa Saiman, MD, MPH, Jane D. Siegel, MD, John J. LiPuma, MD, Rebekah F. Brown, MD, Elizabeth A. Bryson, RN, MSN, PPCN-BC, CS, Mary Jo Chamber, LCSW, MSW, Veronica S. Downer, RN, Jill Fliege, APRN, Leslie A. Hazle, MS, RN,CPN, CPHQ, Manu Jain, MD, MS, Bruce C. Marshall, MD,MMM, Catherine O'Malley, RRT-NPS, AS, Suzanne R. Pattee, JD, Gail Potter-Bynoe, BS, Siobhan Reid, Karen A. Robinson, PhD, Kathryn A. Sabadosa, MPH, H. Joel Schmidt, MD, Elizabeth Tullis, MD, FRCPC, Jennifer Webber, David J. Weber, MD, MPH. *Infection Control and Hospital Epidemiology,* p.000, The University of Chicago Press. http://www.jstor.org/stable/10.1086/676882. 03/07/2014.

CONTEXT

- An updated ***Infection Prevention and Control Guideline for Cystic Fibrosis*** was published in July 2013 following a review of medical evidence by an expert committee convened by the Cystic Fibrosis Foundation (U.S.A).
- The Guidelines contain recommendations that can help reduce the risk of cross infection between people with CF.
- Cystic Fibrosis Canada's Healthcare Advisory Council has endorsed the Guidelines and has recommended that the Guidelines be shared with CF clinics accredited by Cystic Fibrosis Canada.
- As the Guideline contains references to U.S. institutions and programs , Canadian healthcare professionals and hospitals are advised to consider comparable institutions and programs in Canada.
- On the recommendation of the Healthcare Advisory Council, Cystic Fibrosis Canada is raising awareness of the Guidelines within the Canadian CF community in the spirit of health promotion and infection prevention.

CORE RECOMMENDATIONS

Education/Adherence Monitoring for Healthcare Personnel

1. The CFF recommends that all healthcare personnel caring for people with CF (e.g., the CF care team, inpatient staff, environmental services staff, research staff, and staff in diagnostic and therapeutic areas including pulmonary function test laboratories, radiology, phlebotomy, operating room, physical therapy), receive education regarding IP&C for CF, using principles of adult learning. Education should be repeated at intervals each center deems appropriate.

2. The CFF recommends that the CF care team develop strategies to monitor adherence to IP&C practices by healthcare personnel and provide feedback. Feedback to the CF care team includes immediate feedback to an individual when a lapse in practice is observed and feedback to the entire CF care team of trends of overall adherence rates at regular intervals (e.g., quarterly) based on consistency of practices.

CORE RECOMMENDATIONS

Partnering with Institutional IP&C Terms

4. The CFF recommends that CF care teams collaborate with their institutional IP&C teams to implement the recommendations in this guideline.

5. The CFF recommends that CF care teams collaborate with their institutional IP&C teams to develop protocols, checklists and audits to standardize implementation of practices for:

- Single patient use, disposable items
- Cleaning and disinfecting multi-use items (e.g., patient care equipment, oximeters, iPads and similar tablets, computers)
- Cleaning and disinfecting surfaces in the healthcare environment (e.g., CF clinic, pulmonary function test rooms, hospital rooms, sinks and showers).

6. The CFF recommends ensuring that dust containment during renovation and construction and water leak remediation policies and practices are followed according to institutional and national guidelines in all ambulatory care areas and inpatient settings where people with CF receive care.

7. The CFF recommends that healthcare personnel assume that *all* people with CF could have pathogens in respiratory tract secretions that are transmissible to other people with CF.

CORE RECOMMENDATIONS

Practices for Healthcare Personnel

8. The CFF recommends that all healthcare facilities caring for people with CF ensure ready availability of alcohol-based hand rub or antimicrobial soap and water in all patient rooms, pulmonary function test rooms, and waiting areas.

9. The CFF recommends that healthcare personnel perform *hand hygiene* (either using alcohol-based hand rub or washing hands with an antimicrobial soap and water), as per CDC and WHO guidelines, in the following clinical situations:

- Before entering the room and when leaving the room of any patient
- Before and after direct contact with any patient
- Before putting gloves on and after removing gloves, for both sterile and non-sterile procedures
- After contact with patient's skin, mucous membranes, respiratory secretions, or other body fluids
- After contact with inanimate objects (including medical equipment) in the vicinity of the patient that may be potentially contaminated with respiratory secretions

10. The CFF recommends that healthcare personnel should not wear artificial fingernails or nail extenders when having direct contact with people with CF.

As the CF Foundation's Infection Prevention and Control Guideline for Cystic Fibrosis contain references to U.S. institutions and programs , Canadian healthcare professionals and hospitals are advised to consider comparable institutions and programs in Canada.

CORE RECOMMENDATIONS

Practices for Healthcare Personnel

11. The CFF recommends that healthcare personnel should disinfect their stethoscopes before and after use on each patient in accordance with institutional IP&C policies. Stethoscopes that remain in the patient's room and are dedicated for use only for that patient do not need to be disinfected before and after use.

12. The CFF recommends that healthcare personnel caring for people with CF should *not* be routinely screened for MRSA colonization unless they are epidemiologically linked to a cluster of MRSA infections in accordance with institutional IP&C policies and national guidelines.

CORE RECOMMENDATIONS

Isolation Precautions

13. The CFF recommends that all healthcare personnel implement *Contact Precautions*, (i.e., wear a gown and gloves), when caring for all people with CF regardless of respiratory tract culture results, in ambulatory and inpatient settings.

14. The CFF does not recommend that healthcare personnel wear a mask *routinely* when caring for people with CF. However, the CFF recommends mask use per CDC guidelines as follows:

- Surgical (procedure, isolation) masks are worn by healthcare personnel caring for any patient on *Droplet Precautions* with suspected or confirmed pathogens that are transmitted by the droplet route (e.g., adenovirus, rhinovirus, influenza virus or *Mycoplasma pneumoniae*).
- Mask and eye protection should be worn by healthcare personnel if splashes or sprays of respiratory tract secretions are anticipated as per *Standard Precautions.*
- N-95 respirators (masks) or powered air-purifying respirator (PAPRs) are worn by healthcare personnel caring for any patient on *Airborne Precautions* (in an Airborne Infection Isolation Room, AIIR) for suspected or confirmed infection with *Mycobacterium tuberculosis.*

15. The CFF recommends placing people with CF who are acid fast bacilli (AFB) smear positive *for the first time* on *Airborne Precautions* (AIIR require: negative pressure single room, >12 air exchanges per hour, air exhausted to the outside) in ambulatory and inpatient settings until *Mycobacteria tuberculosis* infection has been excluded. Alternatively, in geographic locations with a very low incidence of tuberculosis (TB), a risk assessment that includes the likelihood of exposure to individuals with TB (e.g., travel or visitors from high prevalence areas), may be used to guide the use of AIIRs. Consult with institutional IP&C staff and/or infectious diseases physicians.

CORE RECOMMENDATIONS

Isolation Precautions

16. CFF concludes there is insufficient evidence at the time of publication of this document for or against placing people with CF who are infected with nontuberculous mycobacteria (NTM) on *Airborne Precautions.*

Immunizations/Influenza Chemoprophylaxis

24. The CFF recommends that, as per CDC/ Advisory Committee on Immunization Practices (ACIP) recommendations, all healthcare personnel (unless there is a medical contra-indication to immunization) should be immunized or have evidence of immunity to mumps, measles, rubella, varicella, pertussis (Tdap), and hepatitis B *and* receive an annual influenza immunization.

26. The CFF recommends use of antiviral chemoprophylaxis or treatment (e.g., oseltamivir) for prevention or treatment of influenza according to ACIP recommendations.

Research setting

27. The CFF recommends that for all research activities, people with CF, their family members/ friends, and healthcare personnel follow relevant IP&C recommendations for that healthcare setting.

RECOMMENDATIONS FOR MUCROBIOLOGY AND MOLECULAR EPIDEMIOLOGY

Review Center-Specific Microbiology Data

28. The CFF recommends that all CF centers obtain and review center-specific quarterly surveillance reports (e.g., data from local clinical microbiology laboratory or CFF Patient Registry) of the incidence and prevalence of respiratory tract pathogens at their centers. This review should be conducted in collaboration with institutional IP&C teams and microbiology laboratory directors.

Molecular Typing

29. The CFF recommends that CF isolates of *Burkholderia* spp. are sent to the laboratory at the University of Michigan (U.S.) for confirmation of identification, speciation and molecular typing as follows:

- All initial isolates from every patient
- At least one isolate per patient per year
- Any isolates suspected of being associated with transmission or an outbreak
- Any other non-fermenting Gram-negative organism for which species identification remains equivocal after routine analysis should be sent for confirmation of identification.

30. The CFF recommends that molecular typing of *B. cepacia* complex isolates and other microorganisms (e.g., *Pseudomonas aeruginosa*, nontuberculous mycobacteria) is performed when epidemiologically indicated (e.g., suspected patient-to-patient transmission).

RECOMMENDATIONS FOR MUCROBIOLOGY AND MOLECULAR EPIDEMIOLOGY

Molecular Typing

31. The CFF recommends that molecular typing is performed using an appropriate genotyping method (e.g., pulsed-field gel electrophoresis [PFGE], random amplified polymorphic DNA-polymerase chain reaction [RAPD-PCR], repetitive sequence-based-PCR [Rep-PCR], or multi-locus sequence typing [MLST]).

Surveillance

32. The CFF and European CF Society (ESCF) recommend that screening cultures for nontuberculous mycobacteria (NTM) should be performed annually in individuals with a stable clinical course. Culture and smears for acid fast bacilli from sputum should be used for NTM screening.

In the absence of clinical features suggestive of NTM pulmonary disease, individuals who are not capable of spontaneously producing sputum do not require screening cultures for NTM. The CFF and ECFS recommend against the use of oro-pharyngeal swabs for NTM screening.

33. The CFF concludes there is insufficient evidence at the time of publication of this document to recommend criteria by which to consider a person with CF who previously had *Burkholderia* species isolated from respiratory tract cultures to be '*Burkholderia*–free'.

RECOMMENDATIONS FOR CF CLINICS AND OTHER AMBULATORY CARE AREAS

Scheduling in CF Clinic

34. The CFF recommends that CF clinics schedule and manage people with CF in ways to minimize time in common waiting areas. Such strategies include:

- Stagger clinic schedule
- Place people with CF *regardless of their respiratory culture results* in an exam room immediately upon arrival in the clinic
- Use a pager system or personal cell phone to alert people with CF that exam room is available
- Keep person with CF in one exam room while CF team rotates through the exam room
- Do not share common items, (e.g., clinic computer and toys) and request that people with CF bring their own recreational items to clinic appointments.

35. The CFF recommends that infants under two years of age are separated from other people with CF in CF clinic until adequate infection control education has been provided to and is understood by the caregivers.

36. The CFF recommends that all newly diagnosed people with CF are separated from other people with CF in CF clinic until adequate IP&C education has been provided to and is understood by newly diagnosed individuals and their caregivers.

RECOMMENDATIONS FOR CF CLINICS AND OTHER AMBULATORY CARE AREAS

Scheduling in CF Clinic

37. The CFF concludes there is insufficient evidence at the time of publication of this document for or against *routinely* scheduling CF clinics *based on specific pathogens* isolated from respiratory tract cultures.

Pulmonary Function Testing

38. The CFF recommends that PFTs are performed in one of the following ways:

- In the exam room at the beginning of the clinic visit
- In a negative pressure room (AIIR)
- In a PFT lab with either portable or integrated high- efficiency particulate [HEPA] filters
- In a PFT lab without HEPA filtration, allowing 30 minutes to elapse before next person with CF enters PFT lab.

Environmental Practices

39. The CFF recommends that exam rooms are cleaned and disinfected between patients using a one-step process and EPA-registered hospital grade disinfectant/ detergent designed for housekeeping in accordance with institutional IP&C policies.

RECOMMENDATIONS FOR INPATIENT SETTINGS

Designing a New CF Clinic

40. The CFF recommends that the leadership staff of CF centers collaborate with the institutional IP&C and Planning Design and Construction departments when designing a new CF clinic to ensure a design that includes:

- Provision for management of people with CF who require *Airborne Precautions*
- Appropriate number of exam rooms
- Single-person restrooms
- Adequate space for personal protective equipment (e.g., masks, gowns, gloves) *at the point of use*.

Room Placement

41. The CFF recommends that people with CF be placed in a single-patient room. Only people with CF who live in the same household may share a hospital room.

42. The CFF recommends placing people with CF who are solid organ transplant recipients in a single-patient room in accordance with institutional policy and national guidelines. There is insufficient evidence to recommend for or against a *Protective Environment* (i.e., positive pressure room and HEPA filtration) for solid organ recipients.

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RECOMMENDATIONS FOR INPATIENT SETTINGS

Care of Nebulizer in the Hospital

47. The CFF recommends that:

- Nebulizers are for single-patient use only.
- Aseptic technique is always followed when handling the nebulizer and dispensing medications.
- Single-dose vials of medication used in nebulizers are always preferred.
- Hand-held *disposable* nebulizers are managed as follows:
  - *After each use*, rinse out residual volume with sterile water and wipe mask/mouthpiece with an alcohol pad.
  - Discard the nebulizer every 24 hours.
- Hand-held *reusable* nebulizers (e.g., home equipment) be managed as follows:
  - *After each use,* clean, disinfect, rinse with sterile water (if applicable, following cold disinfection method), and air dry away from sink.
  - *After each use,* the nebulizer can be reprocessed (e.g., by steam sterilization) if the reprocessing is performed according to the manufacturer's instructions and the CFF recommendations for home care (Rec. # 59), and if the nebulizer can be returned to the patient in time for the next treatment.

RECOMMENDATIONS FOR INPATIENT SETTINGS

Animals

48. The CFF recommends that people with CF can participate in animal-assisted ("pet") therapy in accordance with institutional policies.

Designing New Inpatient Facilities

49. The CFF recommends that the leadership staff of CF centers collaborate with the institutional IP&C and the Planning, Design, and Construction departments when designing a new inpatient unit to ensure a design that:

- Provides an adequate number of single-patient rooms to care for people with CF
- Includes a provision for people with CF who require possible *Airborne Precautions*
- Provides access to exercise during hospitalization (e.g., adequate space for exercise equipment)
- Provides adequate space for personal protective equipment (e.g. masks, gowns, gloves), *at the point of use.*

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RECOMMENDATIONS FOR HEALTHCARE PERSONNEL WITH CF

68. The CFF recommends that healthcare personnel with CF should not provide care for other people with CF.

69. The CFF recommends that people with CF interested in a career in healthcare receive counseling from their CF care team regarding specialty areas wherein job duties minimize the risk of transmission or acquisition of potential pathogens.

70. The CFF recommends that healthcare personnel with CF consider informing their employers' Workforce Health & Safety Department about their diagnosis of CF to ensure that job duties are assigned and care practices are adopted that minimize the risk of acquisition or transmission of potential pathogens. This disclosure is legally required to be kept confidential.

71. The CFF recommends that when it is known that a healthcare provider with or without CF is infected/colonized with MRSA, work assignments should be made according to local hospital policy.

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RECOMMENDATIONS FOR HEALTHCARE PERSONNEL WITH CF

72. The CFF recommends that healthcare personnel with CF are assigned to care for patients without CF on a case-by-case basis, considering health- and behavior-related factors, e.g.:

- Frequency and severity of coughing episodes, quantity of sputum production during these episodes, ability to contain respiratory tract secretions.
- Ability to use barrier precautions and adhere to IP&C guidelines, Centers for Medicare and Medicaid Services, HICPAC and CDC Guidelines.
- Risk of patient-to-patient transmission of pathogens by healthcare personnel with CF in the context of specific job duties.

73. The CFF recommends educating, when appropriate, friends, teachers, employers, and co-workers about the rationale for the IP&C guidelines.

74. The CFF recommends identifying CF center-specific concerns for the potential psychosocial impact of the IP&C guideline for people with CF in the hospital, clinic, community, school, and home, and strategies, *including an available counselor,* to minimize the negative impact.

As the CF Foundation's Infection Prevention and Control Guideline for Cystic Fibrosis contain references to U.S. institutions and programs, Canadian healthcare professionals and hospitals are advised to consider comparable institutions and programs in Canada.

RECOMMENDATIONS FOR PSYCHOSOCIAL AND MEDICAL IMPACT OF IP&C

75. The CFF recommends that the CF care team inform people with CF and their parents or legal guardians of their microbiologic status. People with CF and their parents or legal guardians will then determine whom they will inform.

76. The CFF recommends collaboration with the child life staff to ensure individualized programs consistent with the recommended IP&C guidelines.

77. The CFF recommends making accommodations (e.g., providing entertainment, enhancing communication with the outside world, facilitating visits with non-CF individuals, adapting child life programs), to relieve the psychosocial stress of inpatient and outpatient IP&C guidelines without placing people with CF at risk of transmission or acquisition of pathogens.

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To access the full Infection Prevention and Control document click on

http://www.jstor.org/stable/infeconthospepid.ahead-of-print.

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Recommendations for people with CF, and their family and friends

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Context

- An updated ***Infection Prevention and Control Guideline for Cystic Fibrosis*** was published in July 2013 following a review of medical evidence by an expert committee convened by the Cystic Fibrosis Foundation (U.S.A.).
- The Guideline contains recommendations that can help reduce the risk of cross infection between people with CF.
- Cystic Fibrosis Canada's Healthcare Advisory Council has endorsed the Guideline and has recommended that the Guideline be shared with CF clinics accredited by Cystic Fibrosis Canada.
- As the Guideline contains references to U.S. institutions and programs , Canadian healthcare professionals and hospitals are advised to consider comparable institutions and programs in Canada.
- On the recommendation of the Healthcare Advisory Council, Cystic Fibrosis Canada is raising awareness of the Guideline within the Canadian CF community in the spirit of health promotion and infection prevention.

CORE RECOMMENDATIONS

Education/Adherence Monitoring for Healthcare Personnel

3. The CFF recommends that all people with CF and their families receive education regarding IP&C for CF, using age appropriate tools and reading/language level, appropriate to the target audience. Involve people with CF and their families in development of educational programs and implementation of recommended practices. Education should be repeated at intervals each center deems appropriate.

CORE RECOMMENDATIONS

Practice by People with CF and Family Members/Friends

17. The CFF recommends that all people with CF, *regardless of their respiratory tract culture results*, be separated by at least 6 feet (2 meters) from other people with CF in all settings, to reduce the risk of droplet transmission of CF pathogens. This does not apply to members of the same household.

18. The CFF recommends that all people with CF and their family members/friends perform hand hygiene (with either alcohol-based hand rub or an antimicrobial soap and water) when there is a potential for contamination of hands with pathogens, e.g., when:

- Entering and exiting CF clinic, clinic exam room, or hospital room
- Hands become contaminated with respiratory secretions, (e.g., after coughing or performing pulmonary function tests or chest physiotherapy).

19. The CFF does *not* recommend that people with CF wear gowns or gloves in CF clinic, in other ambulatory healthcare settings, or while hospitalized.

20. The CFF recommends that people with CF are instructed to follow *Respiratory Hygiene* practices to contain their secretions when coughing or sneezing, (i.e., cough into a tissue, immediately discard soiled tissue into a trash receptacle, and perform hand hygiene after disposing of soiled tissues). A covered trash receptacle with a foot pedal is preferred.

CORE RECOMMENDATIONS

Practice by People with CF and Family Members/Friends

21. The CFF recommends that all people with CF wear a surgical (procedure, isolation) mask when in a healthcare facility to reduce the risk of transmission or acquisition of CF pathogens. Masks should be worn throughout the facility, including in restrooms. Masks should *not* be worn during pulmonary function testing, in the clinic exam room, or in the patient's hospital room. If the optimal size mask is not available, (e.g., for small infants), use the smallest mask available. If a mask is not tolerated by an individual with CF who is having respiratory distress, encourage that person to follow *Respiratory Hygiene* practices. Masks should be changed when wet.

22. The CFF recommends that all people with CF **who *do not* live in the** same household avoid activities and risk factors that are associated with transmission of CF pathogens in non-healthcare and healthcare settings, including:

- Social contact between people with CF
- Physical contact between people with CF, (e.g., handshakes, kissing, intimate contact)
- Car rides with another person with CF
- Sharing hotel rooms with another person with CF
- Fitness class with another person with CF

Activities that all people with CF, including those who live in same household, should avoid include:

- Sharing personal items (e.g., toothbrush or drinking utensils) with another person with CF
- Sharing respiratory therapy equipment

CORE RECOMMENDATIONS

Practice by People with CF and Family Members/Friends

23. The CFF recommends that:

- Tap water or well water that meets local public health standards, distilled water, or bottled water may be used by people with CF:
  - For *drinking*
  - For *bathing*
  - For *cleaning* nebulizers and other respiratory equipment (e.g., airway clearance devices, spacers, neti pots), if followed by *disinfection*.
  - For the water needed for *heat disinfection* (e.g., boiling, microwaving, steam sterilizing).
- Only *sterile* water can be used for nasal rinses, (e.g., neti pots), filling of humidifier reservoirs, and as a final rinse of respiratory equipment (e.g., after cold disinfection).

CORE RECOMMENDATIONS

Immunizations/Influenza Chemoprophylaxis

25. The CFF recommends that, as per CDC/ACIP recommendations, all people with CF and their family members/ close contacts receive recommended vaccines at the recommended schedule, age, dose and route of administration, unless there is a medical contra-indication.

Research Settings

27. The CFF recommends that for all research activities, people with CF, their family members/ friends, and healthcare personnel follow relevant IP&C recommendations for that healthcare setting.

As the CF Foundation's Infection Prevention and Control Guideline for Cystic Fibrosis contain references to U.S. institutions and programs, Canadian healthcare professionals and hospitals are advised to consider comparable institutions and programs in Canada.

RECOMMENDATIONS FOR INPATIENT SETTINGS

Practices for People with CF and Their Families

43. The CFF recommends evaluating people with CF on a case-by-case basis in accordance with institutional IP&C policies for participation in activities outside of the hospital room (e.g., walking in the hallway, going to playroom, physical therapy, exercise room, or school room), *only when no other person with CF is present,* and under the supervision of a trained staff member.

- Considerations include capability of a person with CF to contain his/ her respiratory tract secretions, age, endemic levels of pathogens in an individual center and adherence to the following practices:
- Perform hand hygiene and put on a mask immediately before leaving patient room.
- After a person with CF has left a hospital activity room, clean surfaces and touched items with an EPA registered hospital disinfectant/detergent.

44. The CFF recommends that all people with CF perform all respiratory interventions (e.g., aerosol therapy, airway clearance, collection of respiratory tract cultures), in the patients' rooms. If two people with CF who live in the same household are sharing a room, these procedures should be performed when the second person is not in the room, whenever possible.

45. The CFF recommends that airway clearance devices (e.g., flutter, acapella, pep device, therapy vest) are for single-patient use only, in accordance with institutional IP&C policies.

46. The CFF recommends following institutional IP&C policies for the use of masks, gowns, and gloves by individuals who are visiting hospitalized people with CF.

RECOMMENDATIONS FOR NONHEALTHCARE SETTINGS

Families with more than 1 Person with CF

50. The CFF recommends that it is preferable that people with CF who live in the same household perform airway clearance with only one person with CF in the room during treatment.

Events and Activities

Please refer to Cystic Fibrosis Canada's Infection Prevention and Control Policy for Cystic Fibrosis Canada Hosted/Sponsored Events & Meetings [http://www.cysticfibrosis.ca/wp-content/uploads/2013/11/Infection-Control-and-Prevention-Policy-September-2013-final.pdf]

51. The CFF recommends against CF-specific camps or CF-specific educational retreats for groups of people with CF. Only one individual with CF should attend any camp or educational retreat unless they live in the same household.

However, family members who do not have CF may attend educational retreats. People with CF are encouraged to participate in camps and sports with non-CF individuals.

52. People with CF and their parents or legal guardians are *not* obligated to disclose the diagnosis of CF or the results of respiratory tract cultures to school or day care personnel. However, the CFF recommends disclosure so that school or day care personnel can be made aware of the importance of IP&C principles and practices for the protection of students with CF and can make the recommended accommodations. Such information must be maintained as confidential medical information unless the person with CF and/or parent or legal guardian choose to make this information known.

RECOMMENDATIONS FOR NONHEALTHCARE SETTINGS

Events and Activities

53. The CFF recommends that people with CF attending the same daycare and/or school should *not* be in the same room at the same time unless they live in the same household. The CFF recommends education of daycare/school personnel on the principles of IP&C for CF so they can work with people with CF and/or parents or legal guardians to develop strategies to minimize contact *between* people with CF (e.g., assignment to separate classrooms, and separation during other scheduled common activities including lunch, physical education, and recess).

54. The CFF recommends that only one person with CF attend CF Foundation-sponsored, healthcare-sponsored or CF Center-sponsored *indoor events* (e.g., CF Education Days) unless they live in the same household, to reduce the risk of person-to-person transmission of CF pathogens.

55. The CFF recommends developing and utilizing alternative CF education programs, (e.g., videotapes, video-conferencing, CD-ROM web-based learning, Apps) that do not require face-to-face meetings among people with CF.

56. The CFF recommends that people with CF can attend CFF-sponsored, healthcare-sponsored, or CF Center-sponsored *outdoor events* (e.g., Great Strides) providing they maintain a distance of at least *6 feet (2 meters)* from others with CF.

RECOMMENDATIONS FOR NONHEALTHCARE SETTINGS

MRSA

57. The CFF recommends that people with CF should avoid direct contact with people with skin and soft tissue infections caused by MRSA *unless* wounds are covered, hand hygiene is performed frequently, personal items are not shared (e.g., towels), sports equipment is cleaned between use, and cleaning protocols for environmental surfaces are established to reduce the risk of MRSA transmission.

58. The CFF recommends that people with CF and respiratory cultures positive for MRSA should *not* be restricted from contact with people without CF in congregate settings (e.g., sports teams, classrooms, and the workplace) if the person with CF performs appropriate hand and respiratory hygiene.

RECOMMENDATIONS FOR NONHEALTHCARE SETTINGS

Nebulizers: Cleaning and Disinfection

59. The CFF recommends the following steps be performed for nebulizers used in the home as soon as possible after each use:

- *Clean* the nebulizer parts with dish detergent soap and water.
- *Disinfect* the nebulizer parts using *one* of the following methods:

Heat methods:

- Place in boiling water and boil for 5 minutes
- Place in microwave-safe receptacle submerged in water and microwave for 5 minutes
- Dishwasher if the water is ≥ 70℃ or 158℉ for 30 minutes
- Electric steam sterilizer

Cold methods:

- *Soak* in 70% isopropyl alcohol for 5 minutes.
- *Soak* in 3% hydrogen peroxide for 30 minutes.
- *Rinse* the cold method disinfectant off using sterile water, not tap water. The *final rinse* must be with sterile or filtered (≤ 0.2 micron filter) water.
- *Air-dry* the nebulizer parts before storage.

60. The CFF recommends that nebulizers used in the home should *not* be disinfected with acetic acid (vinegar), bleach solutions, or benzalkonium chloride (e.g., “Control III”).

RECOMMENDATIONS FOR NONHEALTHCARE SETTINGS

Leisure Activities

61. The CFF recommends that people with CF should limit prolonged and/or repeated exposure to activities that generate dust from soil and organic matter (e.g., gardening and lawn mowing) to decrease exposure to potential soil-borne pathogens (e.g., *Burkholderia* spp., *Aspergillus* spp.).

62. The CFF recommends that people with CF should avoid exposure to construction and renovation activities that generate dust to decrease exposure to potential pathogens (e.g., *Aspergillus* spp.).

63. The CFF recommends that people with CF can swim in pools or water parks with adequate disinfection (e.g., chlorination).

64. The CFF recommends that people with CF avoid activities in hot tubs, whirlpool spas, and stagnant water.

65. There is insufficient evidence at the time of publication of this document for the CFF to recommend for or against people with CF avoiding activities in natural bodies of water that are not stagnant (e.g., ocean, ponds, hot springs).

RECOMMENDATIONS FOR NONHEALTHCARE SETTINGS

Contacts with Pets or Farm Animals

66. The CFF recommends that people with CF perform hand hygiene after changing the litter, handling feces, cleaning and disinfecting the cages or fish tanks of their pets, or interacting with farm animals.

67. The CFF recommends that people with CF avoid cleaning stalls, pens, or coops.

Recommendations for Psychosocial and Medical Impact of IP&C

73. The CFF recommends educating, when appropriate, friends, teachers, employers, and co-workers about the rationale for the IP&C guidelines.

74. The CFF recommends identifying CF center-specific concerns for the potential psychosocial impact of the IP&C guideline for people with CF in the hospital, clinic, community, school, and home, and strategies, *including an available counselor,* to minimize the negative impact.

As the CF Foundation's Infection Prevention and Control Guideline for Cystic Fibrosis contain references to U.S. institutions and programs, Canadian healthcare professionals and hospitals are advised to consider comparable institutions and programs in Canada.

To access the full Infection Prevention and Control document click on

http://www.jstor.org/stable/infeconthospepid.ahead-of-print.