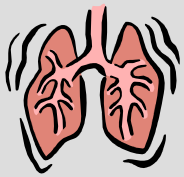
Infection Control – New Knowledge & New Routines

Ellen Julie Hunstad, Norway
& Helle Jacobsen, Denmark,
INSG-CF Workshop,
ECFS Confeernce 2011 Hamburg

Cystic fibrosis – treatment & follow up

Infection Control

Lungtreatment with mucus mobilisation



Medications

Food & Nutrion

Research – from Norway

- A Norwegian study "Typing of Pseudomonas aeruginosa strains in Norwegian cystic fibrosis patients" showed evidence for cross-infection between Norwegian CF-patients.
- Advicory Board for the Norwegian Association for CF made a new recommendation of hygiene precautions for use in hospital and other social events for persons with CF.

(Fluge G & al, 1998)

Basic of CF Infection Control

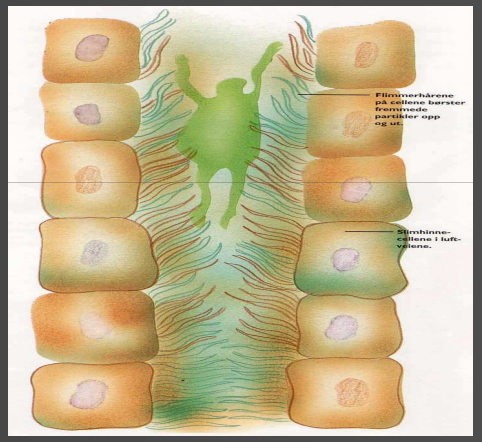
- "Cross-infection control in CF requires implementation of basic hygiene measures and cross-infection control principles, taking into account the nature of CF pathogens.
  - Close liaison is needed between the CF multidisciplinary team, microbiologists and infection control teams..
- Good standards of hygiene should be encouraged.
  - Consideration should also be given to minimizing the risk of cross infection from contamination of the hospital environment and respiratory function equipment.
- Education for patients, their families and CF healthcare workers is important as their support is essential to the success of cross-infection control policies."

  (Jones AM, Webb AK 2003)

Infection control recommendations for patients with cystic fibrosis

- CF pathogens are transmitted by the droplet and contact routes.
  - Therefore, practices that contain respiratory secretions and prevent transmission of respiratory tract pathogens must be taught to patients and their families as well as to CF healthcare workers.

(Saiman L, Siegel J, CFF Consensus Conference 2003)



Infection control recommendations for patients with cystic fibrosis

- Cleaning devices such as nebulizers, with removal of debris as soon as possible and before desinfection, and complete air drying are the critical steps in both healthcare and home settings.
  (Saiman L, Siegel J, CFF Consensus Conference 2003)

Infection control recommendations for patients with cystic fibrosis

- Infection control practicies must be followed with all CF patients, and..
  - cannot be implemented according to individual CF patients, because..
  - microbiology methods are not 100% sensitive for all detection of CF pathogens.

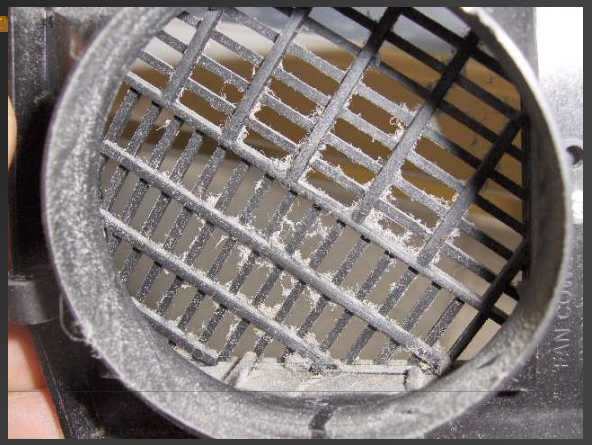
(Saiman L, Siegel J, CFF Consensus Conference 2003)

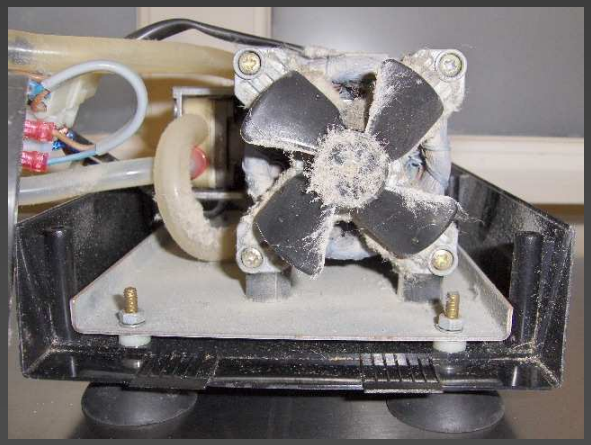
Standards of care for patients with cystic fibrosis: a European consensus 2005

- "We are convinced that intensive treatments, both prophylactic and as a response to acute events, decrease morbidity and increase survival and quality of life.

  (Kerem E, Conway S, Elborn S, Heijerman H, for the concensus commitee)

A well used inhalation compressor..

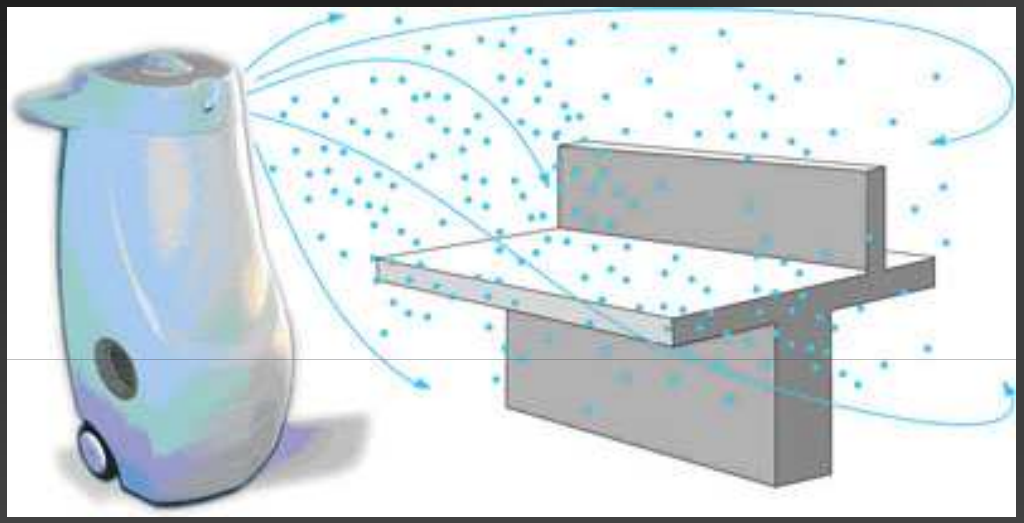




Inhalation equipments – recommendations for cystic fibrosis in home & hospital care in Norway

- **Not recycled inhalation compressor or equipment because risk for contamination and cross infection**
  - Inhalation equipment strict personal use
    - Personal, new or resterilized in hospital
  - Annual asessment for medical technical equipment
    - Technical control
    - Change of inside tubes + technical parts if needed
    - Inside cleaning and gas disifection (Sterinis Robot)
- Change of nebulizers, tubes, masks and mouth piece x 2 per year minimum
  - Cleaning and disinfection (boiling) every day is recommended

Sterinis disinfection robot – for Inhalation equiptment and hospital care



- Effective killing of bacterias, viruses and fungus – except for myco bacterias.
- The robot spread out dry mist of hydogen perioxcyd in a closed room.
- Microbes opens for the mist, incapsulates and get killed.

Infection control before and after transplantation?

Experiences from Tx patients in Norway

- **Before transplantation - waiting..**
  - Information about hygiene and infection control in general
- **After transplantation – with reduced immunity defence..**
  - Education for preventing infections, hygiene in general and handhygiene especially – and vaccination
    - Regularly shower
    - Hand wash after toilet visit
    - Hand wash before making food, eat and taking medicines
    - Keep good mouth hygiene
    - Food hygiene when working with raw materials, preparing food and food left overs
    - Hand shaking? Close contact?

Implementation of European standards of care for cystic fibrosis — Control and treatment of infection

(Elborn JS, Hodson M, Bertram C.) *Journal of Cystic Fibrosis 8 (2009) 211-217*

- Pulmonary exacerbations can damage a patient's lung tissue and, in people with CF, there is a clear correlation between the number of exacerbations per year and patient age.

- Exacerbations are most common in the adolescent and adult population with nearly 50% of patients,
  - between the ages of 18 and 30 years, experiencing at least one exacerbation per year.
  - This contrasts with those under 10 years of age of whom 75–85% remain exacerbation free.

- Recurring exacerbations cause further lung damage and are associated with poorer outcomes.

Implementation of European standards of care for cystic fibrosis — Control and treatment of infection

(Elborn JS, Hodson M, Bertram C.) *Journal of Cystic Fibrosis 8 (2009) 211-217*

- Consensus Guidelines recommend that, in order to minimise cross-infection,
  - beds for patients with CF should be contained in single rooms
  - (which have the additional advantage of facilitating inhaled antibiotic therapy),
  - ideally according to a patient's microbiological status including Pseudomonas subtypes.
- Such segregation is valuable, especially if epidemic strains are involved.

Implementation of European standards of care for cystic fibrosis — Control and treatment of infection

(Elborn JS, Hodson M, Bertram C.) *Journal of Cystic Fibrosis 8 (2009) 211-217*

- The implementation of clear infection control policies is vital for..
  - the control of cross-infection in vulnerable CF patients, ..
  - as every pulmonary infection can cause further lung damage.
- The European Consensus Guidelines and European consensus report, recommend that regular monitoring should occur.
  - Both publications recommend that patients are seen at least every 3 months, or ideally every month,
  - and that microbiological samples are obtained.

Bacterial contamination of cystic fibrosis clinics

(Zuckerman JB et al, the Infection Control Study Group).
Journal of Cystic Fibrosis 8 (2009) 186–192

- This study, performed at a variety of CF centers,
  - Demonstrated a measurable contamination rate of
    - patients' hands and
    - the clinic environment.
  - We confirmed that..
    - the use of alcoholbased hand hygiene products effectively reduced hand carriage of respiratory pathogens, but..
    - also found that repeated handhygiene during office visits is needed to control the risk of recurrent contamination (on equipment and surfaces).

Infection control in cystisk fibrosis: Barriers to implementation and ideas to improvement. (Saiman & Garber 2009)

Table 1 Assessment of baseline compliance with category 1A and 1B infection control recommendations for cystic fibrosis

Baseline practices	Selected recommendations reviewed	% Adherence	
Clinical microbiology laboratory protocols for CF [8]	Reporting mucoidy for *P. aeruginosa*	73%	
	Agar-based *P. aeruginosa* susceptibility testing	52%	
	Prolonged incubation for *B. cepacia* complex	73%	
	Selective media for *B. cepacia* complex	99%	
Infection control protocols for CF [12••]		Inpatient	Outpatient
	Educating patients about hand hygiene	90%	67%
	Discouraging socialization between CF patients	80%	55%
	Implementing '3 foot rule' in CF clinic	52%	41%
	Education of patients/families on home nebulizer care	NA	25%
	Use of contact precautions for patients with:		
	B. cepacia complex	73%	ND
	Multidrug resistant organisms	63%	ND
	Methicillin-resistant *S. aureus*	64%	ND

CF, cystic fibrosis; NA, not applicable; ND, not determined.

Prevention of Pseudomonas aeruginosa infection in cystic fibrosis patients

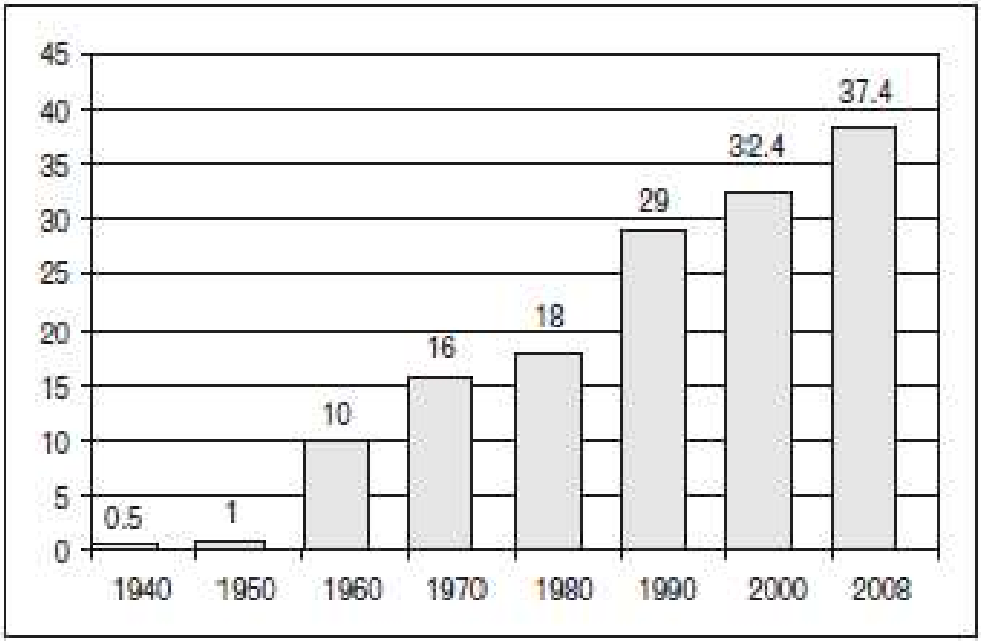
- "Thus, until the lack of efficacious Pseudomonas aeruginosa vaccines is overcome in the future, ..
- improved hygienic measures and early antibiotic eradication therapy remain the cornerstones to prevent chronic P. aeruginosa lung infection in CF patients."

  (Döring G, 2010)

Infection control and life span..

Improving the quality of care for patients with cystic fibrosis. (Michael S. Schechter and Hector H. Gutierrez, 2010).

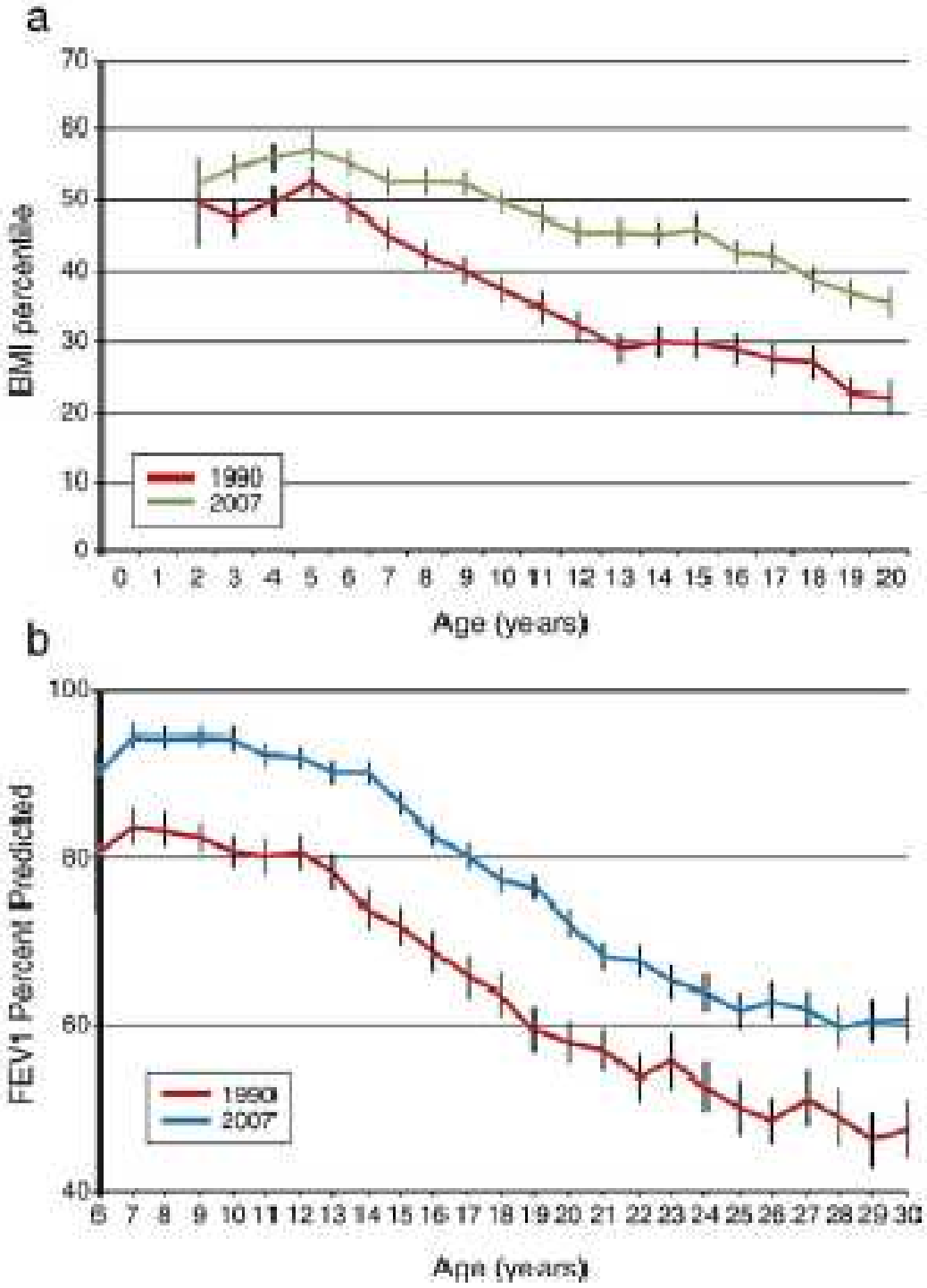
Figure 1 The changes in median predicted age of death (using life table analysis) for the cystic fibrosis population since the disease was first described



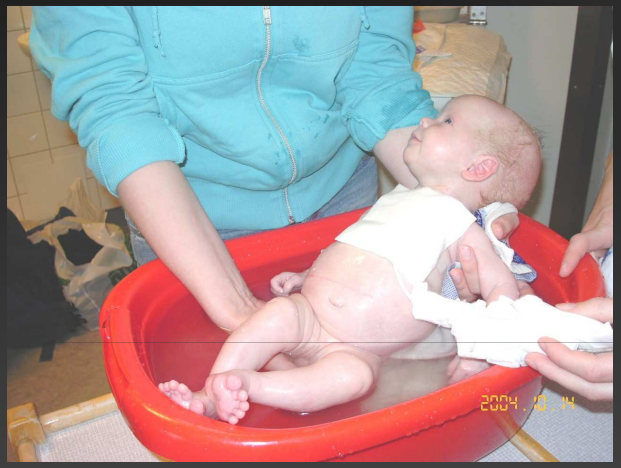
CF, cystic fibrosis. Reproduced from [1].

BMI & FEV1

Measuring and improving outcomes in CF lung disease: Opportunities and challenges to therapy. (Zemanick ET et al, 2010).



Generations of families with Cystic Fibrosis..



Importance of Infection Control for Cystic Fibrosis..

- International Agreement of
  - Protective Hygenic Standard
  - Infection Control
- International Disagreement of
  - Contagiousness of Microbes
  - Restrictions as Segregation ans Isolation
- Scientific Documentation
  - Still limited, difficult to interpret
- Clinical Practice
  - Differencies both national and international

Issues to discuss

- Infection control
  - Contents of infection control?
  - How do we do it?
  - Implications for patient care?
  - Home Care and/or Hospital Care?
  - Professional education?
  - Patient education?
- Focus for nursing improvements?