

**“Improving Infection Control to Limit
Antibiotic Resistance in Chronic Disease:
use of the Inter-disciplinary Cystic Fibrosis
Care team as a Model”**

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Background

- Relationship between infection surveillance and control activities and antibiotic-resistant pathogen rates *
- Traditional strategies focus on inpatient care
 - acute or intensive care setting
 - directed at health care workers (HCWs)

** Am J Infect Control 2005;33:1-5*

Changes in Delivery of Contemporary Health Care

- Increasing shift in the locations where health care is provided
- Emphasis on out-patient management as opposed to inpatient care*
- Patient self responsibility *
- Medical , paramedical and ancillary services delivered at home – the interdisciplinary approach

* *JAMA 2002; 288(19):2469-75*

- Traditional models for implementation of Infection Control Guidelines do not include the patient's perspective

Importance of Antibiotic Resistance in Cystic fibrosis (CF)

- Chronic disease affecting children and adults
- Chronic, recurrent lung infections are a major cause of morbidity and mortality
- Infection with progressively resistant organisms including:
 - Gram negative bacilli (*P. aeruginosa*)
 - Gram positive cocci (MRSA)
- Prognostic implications of acquisition of certain bacteria

Infection Control in CF

- Evidence for patient-to-patient transmission of pathogens in CF
- Evidence of acquisition in in-patient, out-patient and social settings
- Increased patient responsibility for medication self-administration and maintenance of respiratory equipment
- Infection Control Guidelines in CF*
- Concerns voiced by the CF community**

**Am J Infect Control 2003;31 (3): S1-62*

***J Cyst Fibrosis 2002 ; 1(3): 122-30*

Role of the Interdisciplinary CF Care Team

- CF care team : standard of care
 - multi-faceted approach
 - physicians, nurse, social worker, nutritionist, geneticist, physical therapist
- Frequent interaction with patients and families: develop relationship over time
- Varied skills and experience from individual professional disciplines
- Provide insight into patient-centered difficulties and barriers to recommended practices

Specific Aims

Specific Aims:

- To develop and administer a Knowledge, Attitudes and Practices (KAP) survey on Infection Control for CF patients and their families utilizing the interdisciplinary CF care team.
- To obtain a patient-centered perspective of likely barriers to the implementation of Infection Control practices in CF
- Compare and contrast barriers to Infection Control between CF patients (and families) and HCWs in CF

Methods

Methods

- Cross-sectional survey
- 6 month period
- Self-administered KAP questionnaire in English

- Site : Columbia University CF Center
Out-patient clinics :Pediatric (Dr L. Quittell)
& Adult (Dr E. DiMango) CF Care Centers

Patient Selection and Recruitment

- Eligibility:
 - All English speaking patients with an established diagnosis of CF
 - adults and children aged ≥ 13 years with CF
 - and parents of children < 18 years with CF
- IRB approval; waiver of informed consent
- Recruitment : at the time of regular scheduled out-patient visits
- Goal : to survey 100 subjects

KAP Questionnaire: Domains Explored to Assess Potential Barriers to Implementation of Guidelines

KNOWLEDGE:

- Awareness of transmission of respiratory pathogens
- Knowledge of hand hygiene
- Knowledge of cleaning of nebulizer

ATTITUDE:

- Agreement with guidelines eg. avoiding close contact and socializing with other CF patients
- Belief in the effectiveness of a recommended practice (outcome expectancy)

PRACTICE:

- Adherence to specific guidelines
- Factors that make recommended practices difficult to perform

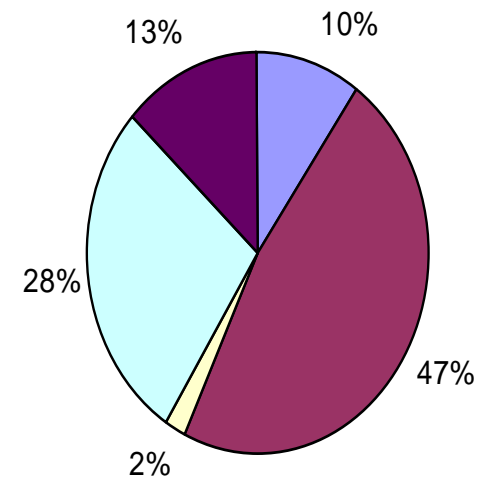
KAP Survey:

- Development of KAP questionnaire by members of the interdisciplinary CF care team
- Survey administration by interdisciplinary team members
- Initial field testing on 25 subjects
 - ease of understanding
 - feedback on format and content of questionnaire
 - time taken for completion
- Monthly team meetings
- Modification and finalization of questionnaire
- Data entry and validation carried out

Results

Results:

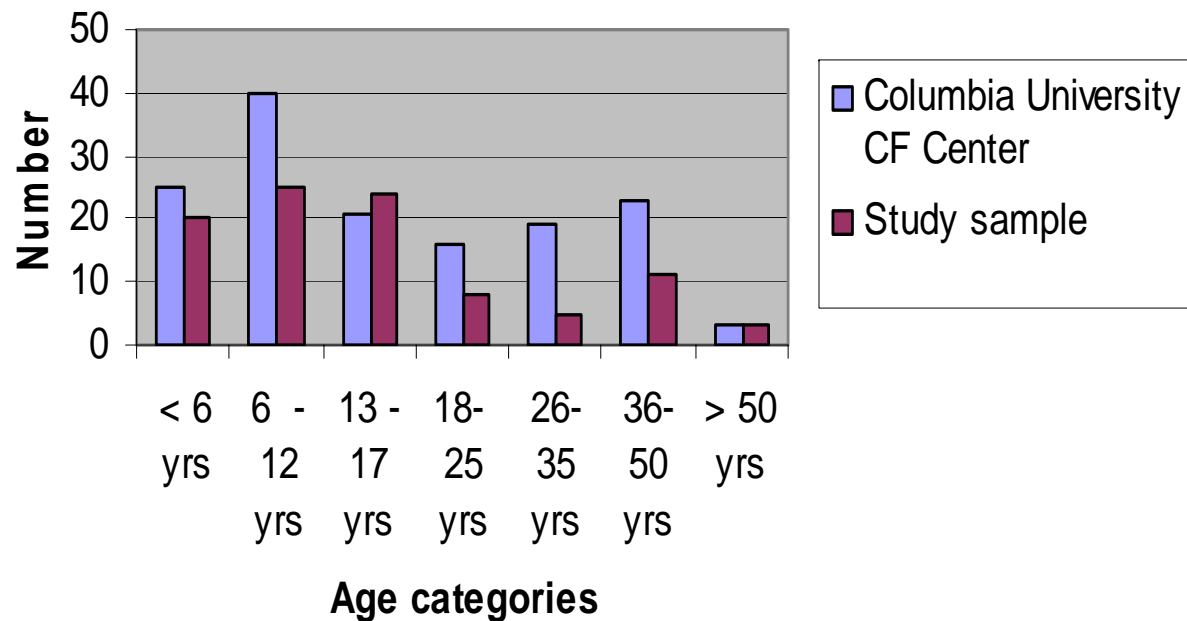
- 97 questionnaires completed by:
 - 57 (58.8%) parents of CF patients < 18 yrs
 - 27 (27.8%) adult CF patients
 - 13 (13.4%) CF patients aged 13- 18 years



■ Father ■ Mother ■ Other caretaker
■ Adult with CF ■ Teenager with CF

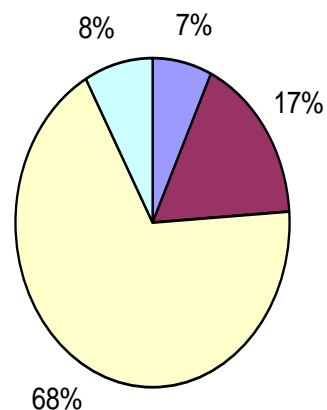
Study Sample Compared to Columbia University CF Center patients

Age distribution of Study subjects compared
to CU CF Center



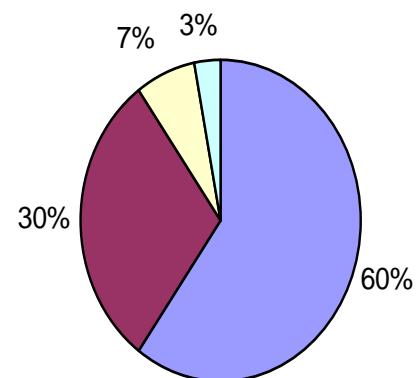
Frequency of CF Related Medical Care : Study subjects

Clinic visits in the past year



■ 1 /year ■ 2-3 /year ■ 4 or more /year ■ missing data

Hospitalizations in the past year



■ None ■ 1 to 2 ■ 3 or more ■ missing data

Knowledge and Attitude Regarding Mechanisms of Spread of Infection

Question	Agree, Strongly agree	Disagree, Strongly disagree
Germs are spread between CF patients	87%	9%
Cleaning nebulizer more often is beneficial	88%	7%
CF patients should maintain 3 feet distance from each other	74%	8%
While hospitalized, CF patients can be in close contact with each other	9%	88%
Benefits of close contact outweigh its risks	13%	68%

Appropriate Hand Hygiene Practices

- 77% stated that the CF team had discussed this practice with them
- Specific times when hand hygiene is performed:
 - 61% after coughing
 - 32% after airway clearance
 - 39% on entering CF clinic
 - 51% on leaving CF clinic

Knowledge and Adherence to Nebulizer Cleaning after Each Use

Knowledge:

- 80% stated that the CF team had discussed this with them
- 50% had been told to clean after each use
- 16% had been told to clean every day

Practice:

- 54% cleaned after each use
- 12% cleaned nebulizer every day
- 35% followed other routines

Ease of Recommended Practice & its Perceived Effect on Improving Health (Outcome Expectancy)

	<u>Ease of the practice</u>	<u>Effect of practice on improving health</u>
Recommended PRACTICE	Very & Extremely easy	Large & Extremely large effect
Cleaning hands	66%	70%
Cleaning nebulizer after each use	52%	76%
Avoid close contact in CF clinic	27%	70%
Avoid close contact during hospitalization	48%	76%

Sources of Infection Control Information: Current and Desired

Source	Current	Desired by participants
Verbal discussion with the CF team	57%	69%
Written information from the CF team	36%	64%
Newsletter	26%	49%
Web cast	19%	31%
Written information from Cystic Fibrosis Foundation	24%	50%

Preliminary findings:

- Study sample is representative of CF patients followed at Columbia University
- CF patients and their family members
 - have knowledge of infection transmission
 - adherence to appropriate hand hygiene practices and nebulizer cleaning methods is less than optimal

Future Directions:

- Comparison of HCWs with CF patients and families
- Sub-group analysis :
 - teenagers versus parents/caretakers, adults with CF
- Development of a multi-center study to further assess and explore barriers to implementation of Infection Control guidelines
 - conduct the KAP CF patient survey at the randomly selected CF centers where the HCW survey was completed
 - target areas for intervention to improve infection control in CF through educational and re-inforcement strategies