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Stopping the Spread of Germs: Infection Control Guidelines at LPCH

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Stanford Cystic Fibrosis Education Day 2013

Overview

- Patients with cystic fibrosis can harbor microbes in their respiratory tracts.
- Acquisition of certain organisms has been associated with more rapid decline in pulmonary function.
- Microbes can be spread through direct contact from person to person and from indirect contact with environment.
- In the clinics and hospitals, we attempt to prevent the spread of pathogens through infection control policies.

Microbes found in the respiratory tracts of patients with CF

- Bacteria

- *Staphylococcus aureus*, *haemophilus influenzae*, *pseudomonas aeruginosa*, *burkholderia cepacia*, nontuberculous mycobacteria

- Viruses

- RSV (respiratory syncytial virus), influenza

- Fungi and molds

- *Aspergillus fumigatus*

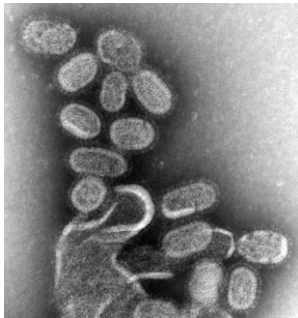
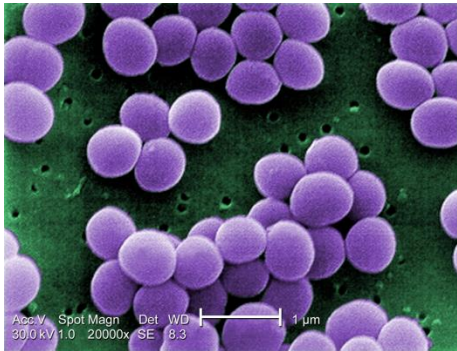
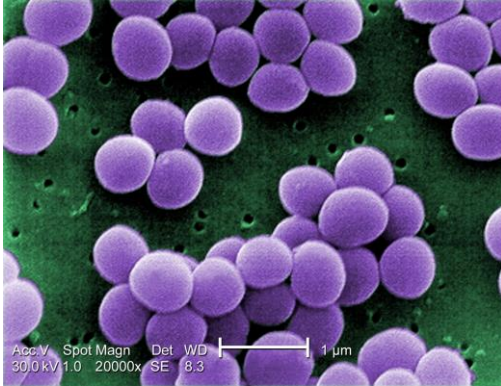


Photo credits: CDC

Staph (*Staphylococcus aureus*)



- Most commonly isolated microbe in infants and children
- Treated when patient exhibits pulmonary symptoms
- MRSA (Methicillin-resistant *Staphylococcus aureus*)
 - Detected in 25% of patients by age 18 years

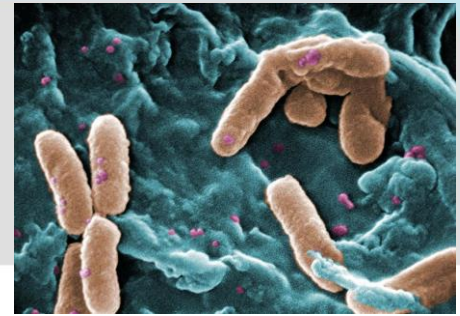
CFFPR, 2011.

Hauser, et al. Clin Microbio Rev. 2011.

Photo Credit: CDC/Janice Haney Carr

Pseudomonas

(*Pseudomonas aeruginosa*)



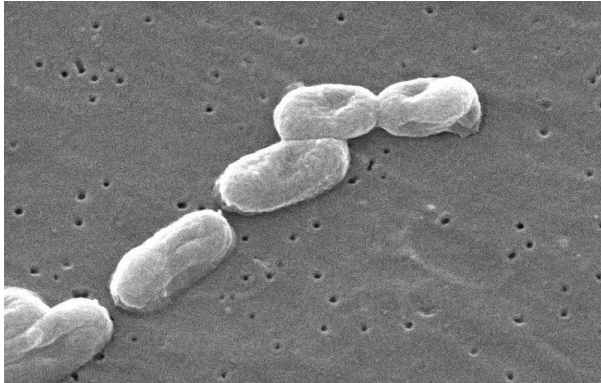
- Found in lakes, streams, moist soil, vegetables
- By 18 years of age, more than 50% of patients have cultures positive for pseudomonas
- Chronic infections are associated with biofilms which make it difficult to eradicate with antibiotics
- Associated with inflammation and progressive lung damage (mucus plugging and bronchiectasis)
- Associated with poor lung function, worse chest imaging, increased daily cough

CFFPR, 2011.

Hauser, et al. Clin Microbio Rev. 2011.

Photo Credit: CDC/Janice Haney Carr

Cepacia (*Burkholderia cepacia*)



- Found in soil, water, plants.
- Acquisition occurs later in CF pulmonary disease
- A small minority (<10%) of patients have cepacia in their lungs.
- In a small subset of patients, associated with rapid decline in lung function.

CFFPR, 2011.
Hauser, et al. Clin Microbio Rev. 2011.
Photo Credit: CDC/Janice Carr

NTM (Nontuberculous mycobacteria)

- Found in environment: wet soil, streams, rivers, water
- Many different types of mycobacteria
- *Mycobacterium abscessus*
 - Associated with rapid decline in pulmonary function

Aspergillus (*Aspergillus fumigatus*)

- Found in soil, plants, decomposing organic matter
- Spores can be aerosolized by construction
- Associated with allergic bronchopulmonary aspergillosis (ABPA)
 - Untreated can lead to bronchiectasis and fibrosis
- Rarely causes invasive disease nor infection



Hauser, et al. Clin Microbio Rev. 2011.
Photo credit: CDC

How do germs spread?

Contact

- Direct: person to person
- Indirect: contact with contaminated object or surface
- Bacteria, viruses

How do germs spread?



Droplet

- Droplets of liquid formed with talking, coughing, sneezing
- Can travel 3-6 feet through the air
- Viruses

How do germs spread?

Airborne

- Microbe found on dust or particles in the air
- Float in the air for long periods of time
- Mycobacterium, aspergillus

Infection control for patients with CF

- Standard precautions and transmission based precautions
- Applies to all patients with CF
 - Not based on specific microbiology results for individual patients

Gibson, et al. AJRCC, 2003.
Consensus conference. 2001.



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Infection Control in Clinic: Clinic visits

Infection Control in Clinic: Coming to clinic

Due to construction around LPCH

- Vehicles have windows rolled up.
- Vehicle's air circulation on recirculation
- Wear N95 mask from car to exam room.



Photo credit: 3M.com

Infection Control in Clinic: Waiting room

- Patient must wear a mask when inside the clinic or hospital.
- “3-foot rule”
 - Maintain 3 feet distance from other persons, to minimize risk of cross-infection by droplet spread.

Infection Control in Clinic: During clinic visit



- Each patient has their own room.
- Personnel wear gloves upon entering the room.
- Hand hygiene:
 - 60% Alcohol gel/foam for 10-15 seconds.
 - Wash hands for 10-15 seconds.
- Masks are indicated for those within 3 feet of the patient.
- Gowns are indicated for direct patient care.

Handwashing Steps



1. Wet hands with warm water.
2. Apply soap: liquid antibacterial soap is best.
3. Rub hands together to lather.
4. Scrub hands well, back and front, up to wrist, and between fingers. Clean under nails. This should take 15 seconds to complete.
5. Rinse in warm, running water.
6. Use a clean towel to dry your hands. Paper towels are best.
7. Turn off the faucet using the paper towel.

Infection Control in Clinic: After the clinic visit

- Exam table and high touch surfaces wiped with a detergent-germicide between patients by clinic staff.
- Exam tables are thoroughly disinfected on a daily basis by Housekeeping.
- Floors are cleaned daily.
- Respiratory devices are thoroughly cleaned and disinfected between patient use.
- Disposable items are discarded.



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Infection Control in the Hospital: Inpatient stays

Infection Control in the Hospital: In your room

- Each patient has a private room.
- Dedicated patient equipment (stethoscope)
- Equipment, toys, and other supplies brought into the isolation room must be disinfected before removing from the room.
- A container of disinfectant wipes must be stored in the patient's room.

STOP

Contact and Droplet Precautions

Visitors must speak with nurse before entering room.



Hand Hygiene: Wash hands with antimicrobial soap or sanitize hands with alcohol gel for 15 seconds before patient contact, after glove removal and before leaving the patient's room.



Surgical mask or faceshield required within 3 feet of patient.



Gloves: Wear gloves when entering room. Change gloves after contact with infective material. Remove gloves before leaving the patient's room.



Gown: Wear a gown if you anticipate that your clothes will have contact with the patient, environmental surfaces or items in the patient's room. Remove the gown before leaving the patient's environment.



Equipment: When possible, dedicate the use of noncritical patient care equipment to this patient. Disinfect all patient care equipment before removing it from patient's room.

Infection Control in the Hospital: Contact/Droplet Isolation



- Gloves when entering the room.
- Gowns, if contact with the patient or the patient's environment is anticipated.
- Mask, if within 3 feet of the patient.
- Hand hygiene

Infection Control in the Hospital: Activity

- Patients must remain in their room.
- Patients may not attend community programs, school, playroom, community recreation activities.
 - Child Life specialists and School teachers will visit, assess, and provide for patient needs.
- Patients may not co-mingle with other CF patients nor immunocompromised patients.
- Siblings and visitors may not attend community rooms.

Infection Control in the Hospital: Cleaning and Disinfection

- Any equipment (IV poles, wagons, respiratory therapy equipment) are disinfected before removal.
- Housekeeping performs routine daily cleaning.
- Terminal cleaning of the isolation room, including removal and disinfection of curtains, is performed at the time of patient discharge.

Recap

- Acquisition of certain microbes has been associated with progression of lung disease.
- Microbes can be spread through direct contact from person to person and from indirect contact with environment.
- In the clinics and hospitals, we attempt to prevent the spread of pathogens through standard precautions and transmission-based infection control policies.

Nebulizer care steps

- Clean
- Disinfect
- Rinse
- Air dry

Disinfect the nebulizer parts:

- Boiling for 5 minutes;
- Microwaving (in water) for 5 minutes;
- Dishwasher, if the water is hotter than 158° F for 30 minutes;
- Soaking in a solution of 1 part household bleach and 50 parts water for 3 minutes;
- Soaking in 70% isopropyl alcohol for 5 minutes; or
- Soaking in 3% hydrogen peroxide for 30 minutes.
- Use sterile water for the final rinse.
 - You can make water sterile by boiling it for 5 minutes. Use this water once, then throw it out. If you disinfect by boiling, you do not need to rinse the nebulizer.