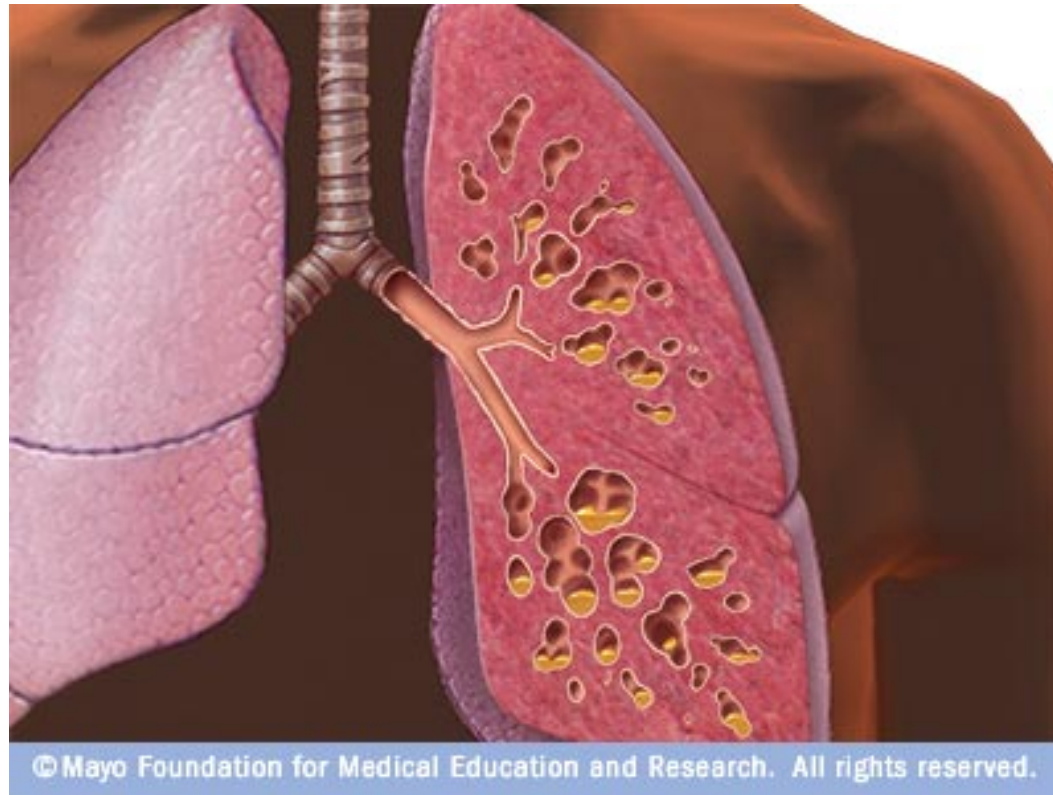


Cystic Fibrosis and Pulmonary Infections



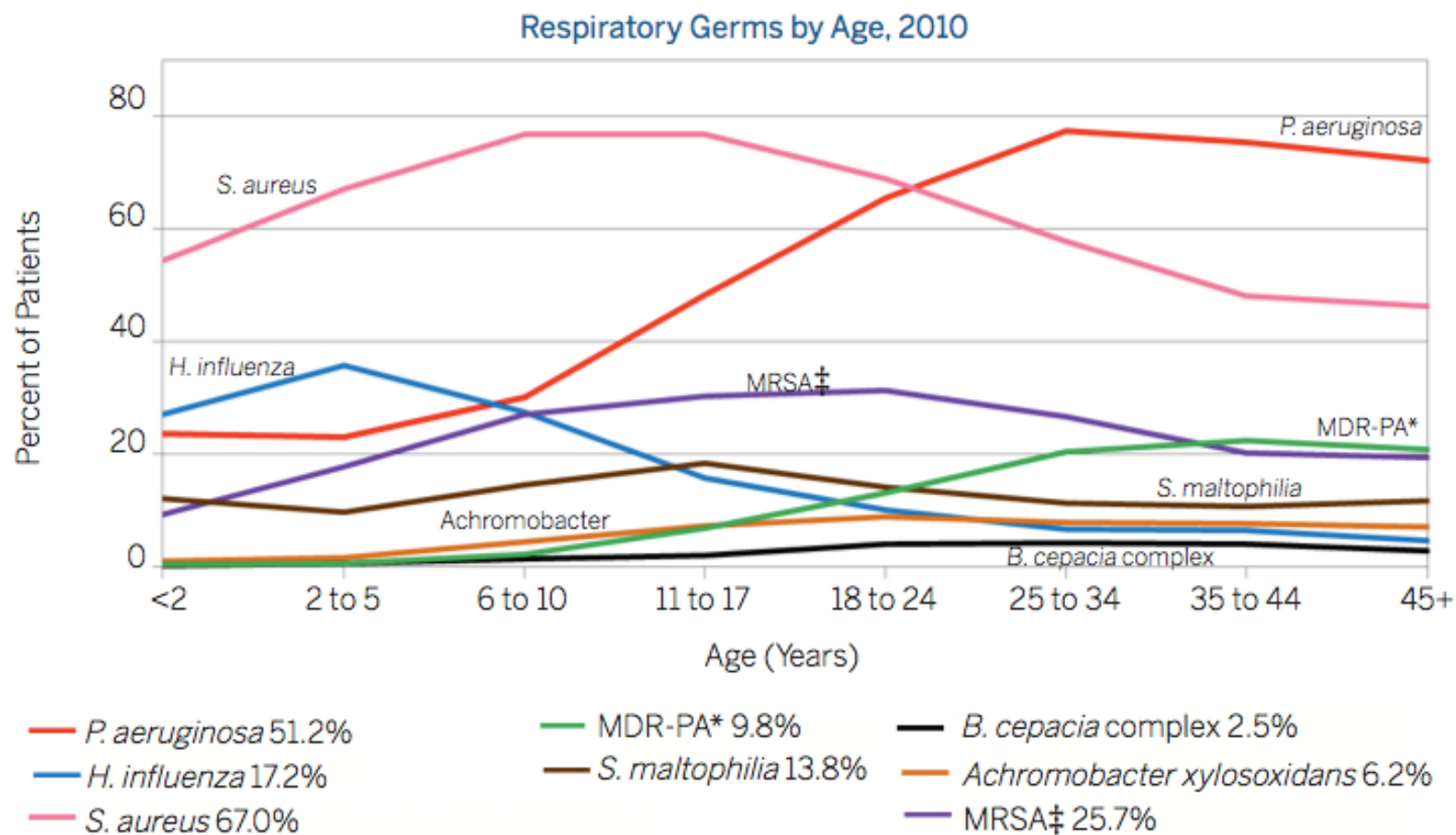
Keith Murphy, MD
Med/Peds

(Originally for: Peds Pulmonary rotation April, 2012)

Airway pathogens

- *Pseudomonas aeruginosa*
- *Staphylococcus aureus* (and MRSA)
- *Burkholderia cepacia*
- Non-typeable *Haemophilus influenzae*
- *Stenotrophomonas maltophilia*
- *Achromobacter xylosoxidans*
- Nontuberculous mycobacteria
- *Aspergillus* species

	2000	2010
Respiratory cultures positive for (%)		
<i>Pseudomonas aeruginosa</i> (<i>P. aeruginosa</i>)	58.8	51.2
Multiple drug resistant <i>P. aeruginosa</i> ‡	-	19
<i>B. cepacia</i> complex	3.2	2.5
<i>Staphylococcus aureus</i> ** (<i>S. aureus</i>)	49.8	67
MRSA	6.1	25.7



*MDR-PA is multi-drug resistant *Pseudomonas aeruginosa* (*P. aeruginosa*)

‡MRSA is methicillin-resistant *Staphylococcus aureus* (*S. aureus*)

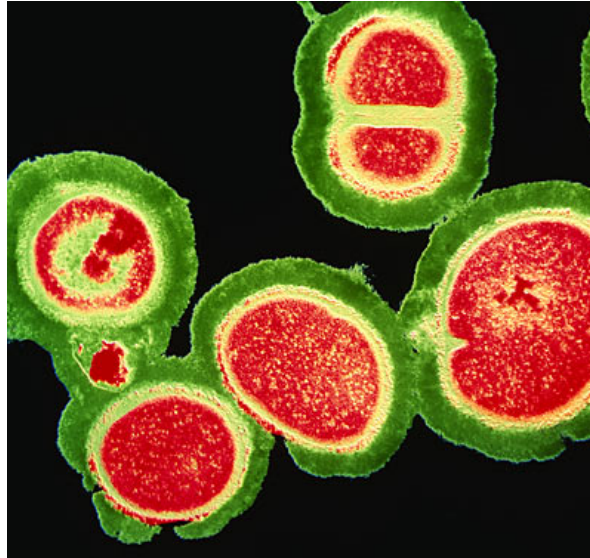
Pseudomonas aeruginosa

- CF airway more susceptible, etiology unclear
- Chronic infection is an independent risk factor for:
 - Accelerated loss of lung function
 - decreased survival
- Conversion to mucoid type = worse



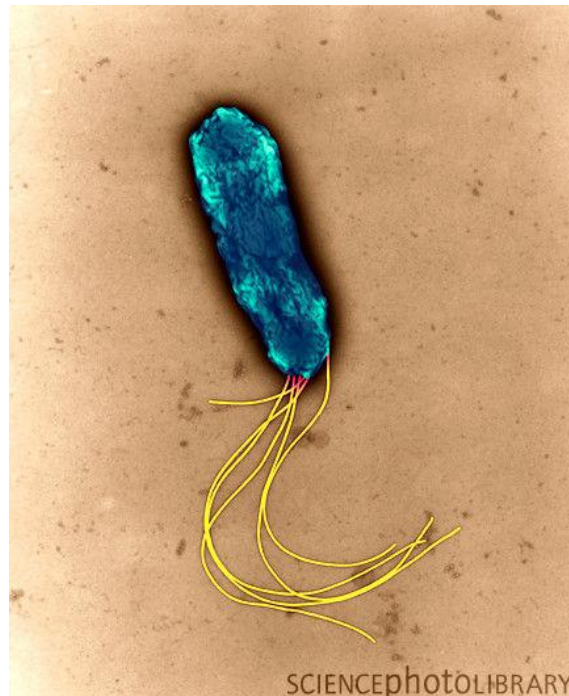
MRSA

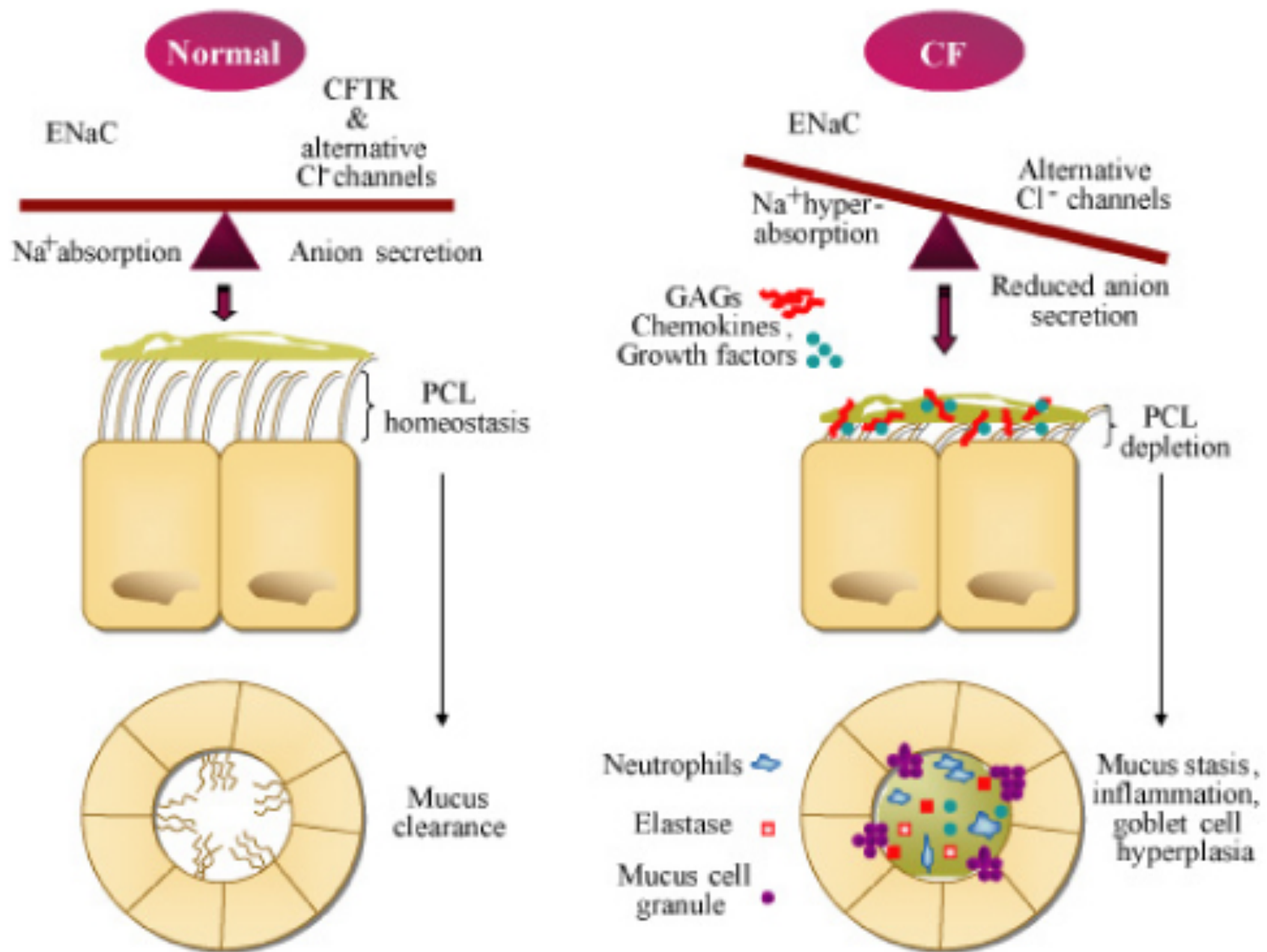
- Most common pathogen in kids with CF
- Independent risk factor, associated with a 1.3x increased risk of death



Burkholderia cepacia

- Associated with:
 - accelerated decline in pulmonary function
 - shortened survival





PCL: periciliary liquid, GAGs: glycoaminoglycans, ENaC: epithelial sodium channel

Why do we double cover *Pseudomonas*?

TABLE 2. EVALUATION OF THE EVIDENCE

Question	Studies	N	Certainty	Magnitude of Benefit	Grade of Recommendation	Recommendation
Site of treatment*	1 RCT(7)	17	Low		I	Insufficient evidence that hospital and home treatment are equivalent
Chronic therapies	**	**	Moderate	Moderate	B	Continue current practices
Simultaneous use of inhaled and IV antibiotics	0	0	Low		I	Insufficient evidence to recommend for or against simultaneous use
Airway clearance therapies	**	**	Moderate	Moderate	B	Continue current practices
Number of antibiotics to treat <i>Pseudomonas</i> *	17 RCT(25–41) 1 RXO(42) 1 QRT(43)	768	Low		I	Insufficient evidence that a single antibiotic is equivalent to a combination antibiotics
Aminoglycoside dosing*	4 RCT(29, 51–53) 1 RXO(54)	349	Moderate	Small	C	Once-daily dosing is acceptable for treatment of <i>Pseudomonas</i>
Continuous infusion beta-lactam antibiotics	1 XO(56)	5	Low		I	Insufficient evidence to recommend continuous infusion
Duration of antibiotics*	0	0	Low		I	Insufficient evidence to define optimal duration of antibiotics
Synergy testing (routine)	1 RCT(24)	132	Low	Zero	D	Routine use not recommended
Systemic steroids	2 RCT(63, 64)	44	Low		I	Insufficient evidence to recommend use of corticosteroids

Definition of abbreviations: N = number of patients evaluated; RCT = randomized controlled trial; RXO = randomized crossover trial; QRT = quasi-randomized trial; XO = crossover trial.

* Cochrane Review exists on this topic.

** Previous recommendations (10, 11).

Smith, *et al.*

- n=76
- Azlocillin IV + (tobramycin IV vs placebo)

Azlocillin is similar to piperacillin

- Time to readmission was longer in azlocillin + tobramycin group

Smith, et al.

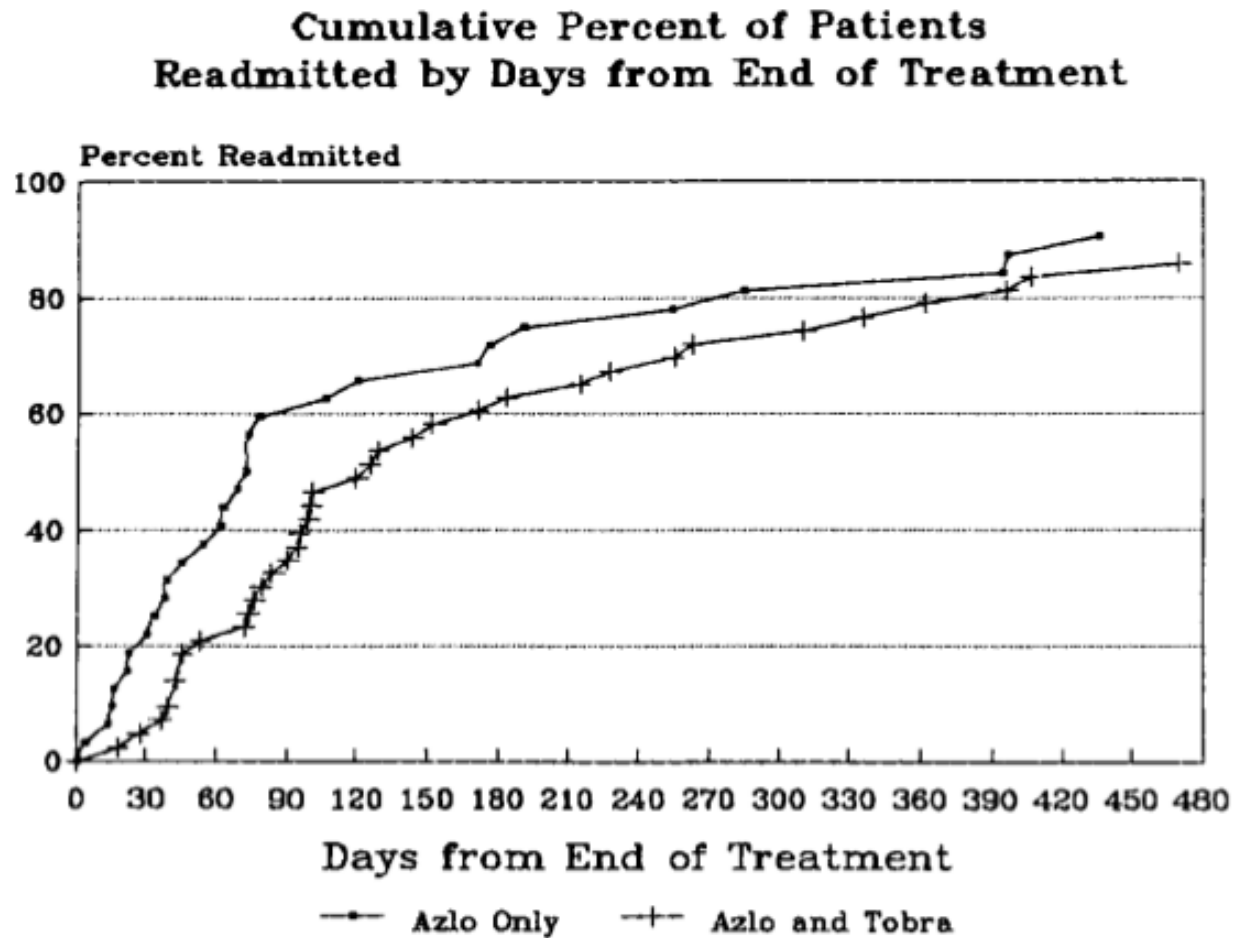


Fig 2. Relationship between treatment group and time to readmission for pulmonary exacerbation requiring hospitalization.

Why do we double cover *Pseudomonas*?

Although the Committee recognizes that the use of combination antibiotic therapy has not been validated in the treatment of CF lung infections,

the standard of care has been to use combination antibiotics

as treatment of *P. aeruginosa* in patients with CF. As such,

the Committee felt that there is not compelling evidence to change that strategy.

Thanks!
Access this talk again at:
<http://keithmurphy.org/talks>

