What outcomes will benefit from inhalation therapy?

Most evidence is in moderate to severe COPD (FEV_1 < 65% predicted)

What is the benefit of long-acting bronchodilators over short-acting?	**LABA**		
	Benefit vs placebo (SABA)	Hospitalizations, exacerbations Possibly quality of life	NNT* 18 (13 to 34) for 1 year NNT 14 (8 to 43)
	Equal to placebo	Mortality, dyspnea	
	Equal to IPRA	Exacerbations, quality of life, dyspnea, exercise	
	TIO		
	Benefit vs placebo (SABA)	Dyspnea, exacerbations Hospitalizations Possibly quality of life	NNT 15 (11 to 24) for 1 year NNT 42 (20 to 500) for 1 year NNT 8 (5 to 16)
	Benefit vs IPRA	Exacerbations, dyspnea Possibly quality of life	 NNT 7 (4 to 12)
	Equal to placebo	Mortality, exercise	
	Equal to IPRA	Hospitalizations	
Is there any benefit for TIO vs LABA?	**TIO vs LABA**	Equal for mortality, hospitalizations, exacerbations, quality of life, dyspnea, exercise	
Is there benefit to using both TIO and LABA?	**TIO + LABA**		
	Equal to TIO	Hospitalizations, exacerbations, quality of life, dyspnea, exercise	
	Equal to LABA	Quality of life	
	Equal to TIO+LABA+ICS	Hospitalizations, exacerbations, quality of life, dyspnea	
Is there benefit to adding ICS to LABA?	**LABA+ICS**		
	Benefit vs LABA	Exacerbations Possibly quality of life	 NNT 9 (6 to 17)
	Equal to LABA	Mortality, hospitalizations, dyspnea	
How does LABA+ICS compare with TIO?	**LABA+ICS**		
	Benefit vs TIO	Possibly mortality Possibly quality of life	NNT 40 (21 to 327) for 2 years NNT 22
	Equal to TIO	Hospitalizations, exacerbations	
How does TIO+LABA+ICS compare to TIO?	**TIO+LABA+ICS**		
	Benefit vs TIO	Quality of life, hospitalizations	NNT 7 (4 to 26) for 1 year
	Equal to TIO	Exacerbations, dyspnea	
How do long-acting agents compare to regularly administered SABAs?		No published evidence	
How does TIO+LABA+ICS compare to LABA?		No published evidence	
Is there benefit to adding ICS to TIO?		No published evidence	

Text in blue indicates drugs and outcomes that have shown benefit.

Outcomes based on **statistically** significant differences are: mortality, COPD hospitalizations, and exacerbations

Outcomes based on **clinically** significant differences are: quality of life, dyspnea, and exercise

Possible benefits indicate inconsistent results from different analyses of data and/or secondary outcomes and should be interpreted cautiously.

IPRA = ipratropium SABA = short-acting $beta_2$ agonist LABA = long-acting $beta_2$ agonist ICS= inhaled corticosteroid TIO = tiotropium

* NNT = number needed to treat. Calculations are based on a limited number of studies and are meant to provide an **approximate** estimate. Where two outcomes appear before an NNT, the NNT refers to the second listed outcome. Parentheses indicate 95% confidence intervals. No time frame given for quality of life estimates because studies of different duration (3 months to 4 years) were used in calculations.