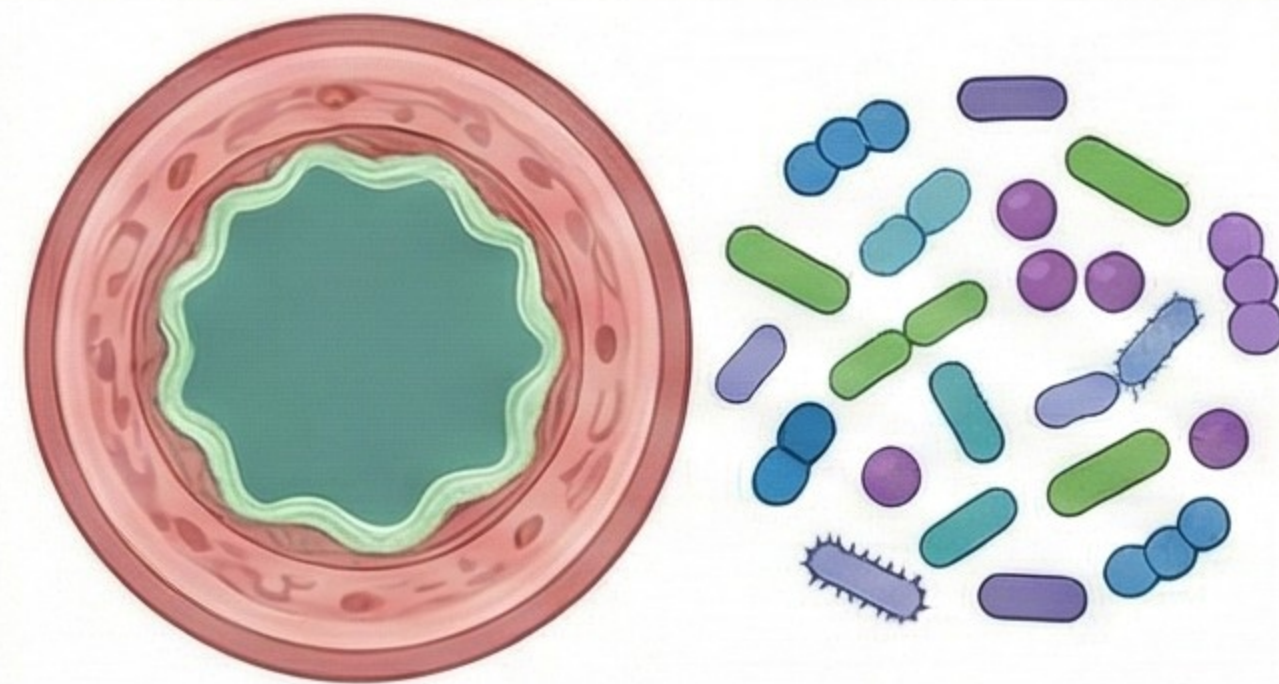


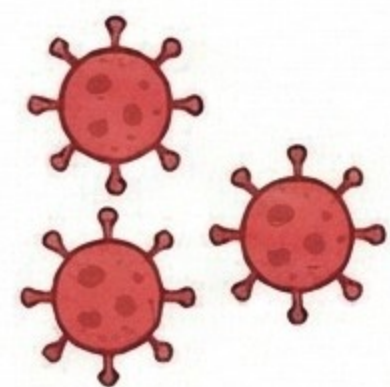
Longitudinal Microbiota-Immune Axis Dynamics in COPD & The Role of Precision Nursing Adherence

T0: Stable Baseline



High Diversity,
Balanced Microbiota

Immune Status



IL-8, IL-1 β , TNF- α
(Low)

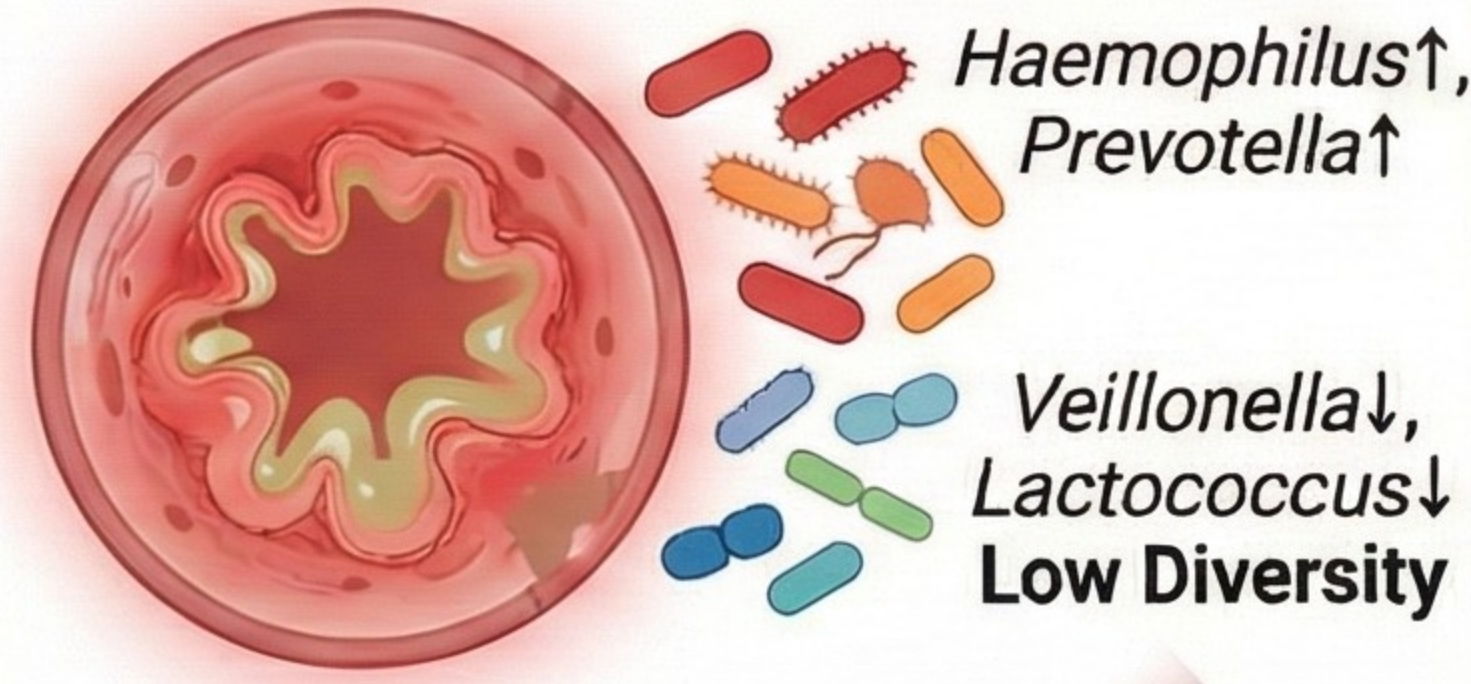


SLPI
(High)

Stable Symptoms
(Low CAT/mMRC)

Exacerbation
Trigger

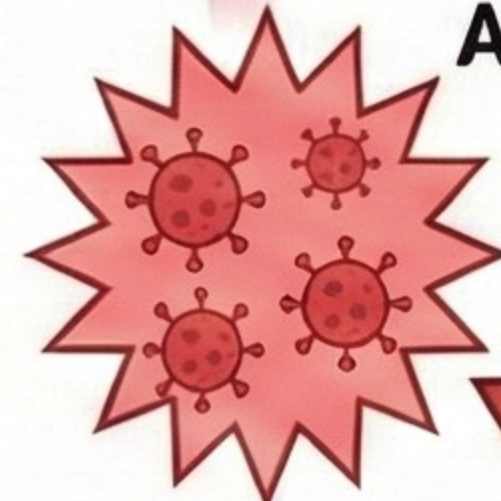
T1: Acute Exacerbation



Haemophilus↑,
Prevotella↑

Veillonella↓,
Lactococcus↓
Low Diversity

Microbiota-Immune Axis Dysregulation



IL-8↑, IL-1 β ↑,
TNF- α ↑
(Inflammation Burst)



SLPI↓

(Reduced Protection)

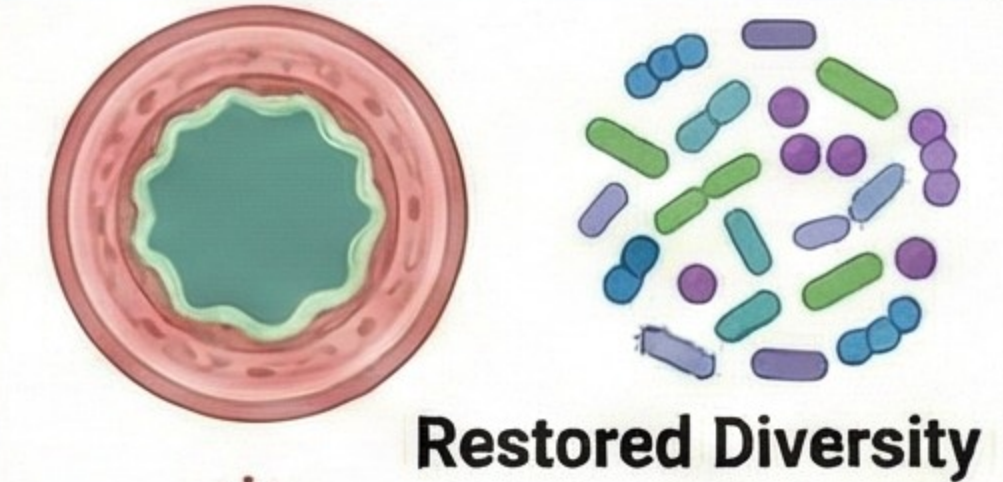
Worsened Symptoms
(High CAT/mMRC)

T2: Recovery & Modulation

Good
Adherence



Poor
Adherence



Restored Diversity

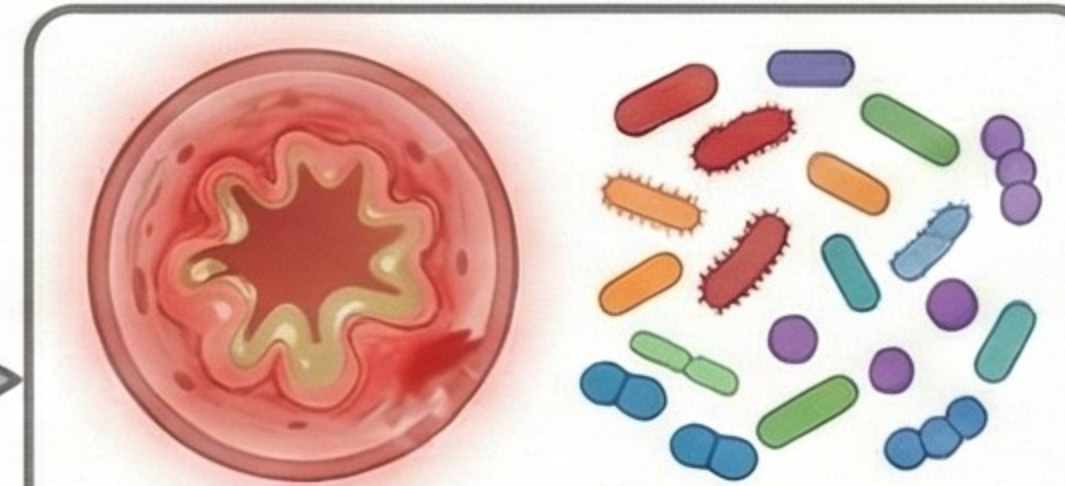


IL-8↓,
Inflammation
Resolving



SLPI↑

Improved Recovery
& QoL



Persistent Dysbiosis,
Slower Recovery



TARGET FOR
PRECISION
NURSING