

Pathophysiology of Bronchial Asthma: Bronchial asthma is a chronic inflammatory disease of the airways characterized by hyperresponsiveness, airflow obstruction, and recurrent episodes of wheezing, breathlessness, chest tightness, and coughing. Airway Remodeling: o Chronic inflammation leads to structural changes in the airway over time: o Smooth muscle hypertrophy and hyperplasia o Subepithelial fibrosis (due to deposition of collagen and extracellular matrix) o Goblet cell hyperplasia and increased mucus production o Thickening of the basement membrane o These changes contribute to irreversible airflow limitation in severe or poorly controlled asthma. Airflow Obstruction: o Obstruction is caused by a combination of: o Bronchial smooth muscle contraction o Airway edema o Mucus plugging o This results in reduced airflow, especially during expiration, causing air trapping and increased work of breathing. Summary: Asthma is driven by chronic inflammation and immune dysregulation, leading to airway hyperresponsiveness, reversible obstruction, and structural remodeling over time. Airway Inflammation: o Chronic inflammation is the hallmark of asthma and is triggered by exposure to allergens, irritants, or infections. o Inflammatory mediators (e.g., histamine, leukotrienes, prostaglandins) cause bronchoconstriction, vascular leakage, and mucus hypersecretion. o Chest tightness: Caused by :.airway narrowing and hyperinflation.2.3.4.5.6.7