

# Frequency Response of Lung

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# Respiratory System Dynamics

- Respiratory disorders are common in both developed and developing countries.
- Many of these disorders are directly connected to the constrictions in the airways of the human respiratory system.
- Asthma and bronchitis are typical examples that arise from the constriction of airways.
- Asthma is a respiratory disease that is characterised by chronic inflammation, hypersensitivity, and obstruction of the airways.
- During an asthma attack contraction of airway smooth muscle and mucous production cause a reduction of the bronchial diameter, significantly changing the airflow resistance in and out of the lungs.

# Main objectives of this research

- To develop an affordable, reliable, fast (time saving) and portable diagnostic technique to determine the frequency spectrum of the lung, also it will be helpful to determine the correlation between the various diseases, in particular Asthma, COPD and OSA.
- Investigate the effect of various diseases on lung response spectrum and develop a diagnostic tool.

**COPD: Chronic obstructive pulmonary disease**

**OSA: Obstructive sleep apnoea**

- With limited asthmatic patients involved, there is no definite finding with quantification of vibration response imaging (VRI) that records and creates a dynamic image of breath sounds in Dellinger's research.
- The future studies should involve the perspective to separate inspiration from expiration in order to obtain more precise regional assessment.
- The VRI device may provide a new perspective in vibration imaging and quantification of breath sounds by adding aspects of time analysis and quantification of distribution to existing methods.
- This research will extend the scope of previous studies in focusing on the mechanical characteristic change in different sections of the lung.
- Lung sound image shall be mapped based on clinical trials on patients with pulmonary diseases.

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