



Review Article

Association Between *Pranavaha Srotas* and Functions of *Pranavayu*: A Literary Review

Amruta Suresh Jaybhay¹

BAMS, MD (Kriyasharir), PhD (Scholar),

Professor and HOD, Dept of Kriyasharir,

Dr.J.J.M.A.M.C, Jaysingpur, Kolhapur Maharashtra

Email : dr.amruta06@gmail.com

Sampada Sant²

PhD Guide and Dean,

R.A. Potdar Ayurved Medical College,

Worli, Mumbai, Maharashtra

Email : sampadasant17@gmail.com

Abstract

The concept of *Pranavaha Srotas* and *Pranavayu* represents the Ayurvedic understanding of respiratory physiology, life-sustaining processes, and systemic regulation. In Ayurveda, *Prana* is considered a fundamental life force responsible for respiration, sensory perception, mental activity, and maintenance of vital functions. *Pranavaha Srotas*, described as the channel system responsible for carrying *Prana*, is closely associated with the functioning of the respiratory system and the regulation of physiological activities. Modern physiology recognizes respiration as a complex process involving pulmonary ventilation, gas exchange, neural regulation, and oxygen delivery, which together maintain cellular metabolism and homeostasis. This literary review critically analyzes the relationship between *Pranavaha Srotas* and the functions attributed to *Pranavayu* by correlating classical Ayurvedic descriptions with contemporary physiological concepts. Classical texts including *Charaka Samhita*, *Sushruta Samhita*, and *Ashtanga Hridaya* were reviewed along with modern scientific literature from PubMed, Scopus, and Web of Science. The review suggests that *Pranavayu* functions such as inhalation (*Shwasa*), speech (*Vak Pravritti*), sensory coordination, mental activity, and maintenance of vital energy can be interpreted

through the integrated functions of respiratory, nervous, and cardiovascular systems. Disturbance of *Pranavaha Srotas* may correlate with respiratory disorders, impaired oxygenation, and autonomic dysfunction. Understanding this association may provide a broader integrative framework for respiratory physiology and disease management.

Keywords

Pranavaha Srotas, *Pranavayu*, *Ayurveda*, *respiratory physiology*, *Srotas*, *Prana*, *literary review*

1. Introduction

Respiration is one of the most essential physiological processes required for survival. It ensures oxygen supply, carbon dioxide elimination, cellular metabolism, and maintenance of internal homeostasis. Modern physiology explains respiration as a coordinated activity involving the respiratory system, nervous regulation, cardiovascular circulation, and cellular metabolism [1].

Ayurveda describes a similar life-sustaining concept through the principle of *Prana*. *Prana* is considered responsible for all vital activities of the body including respiration, consciousness, sensory perception, speech, and movement [2].

Among the five subdivisions of *Vata Dosha*, *Pranavayu* occupies a superior position because of its role in maintaining life processes. It governs:

- Breathing (*Shwasa*)
- Swallowing
- Speech
- Sensory functions
- Mental activity [3]

The pathway through which *Prana* circulates is described as *Pranavaha Srotas*. Proper functioning of this channel maintains physiological equilibrium, whereas its disturbance leads to diseases such as *Shwasa*, *Kasa*, and other respiratory disorders [4].

Although Ayurvedic descriptions of *Pranavaha Srotas* are extensive, their correlation with modern physiological systems requires systematic analysis. Understanding this relationship may provide valuable insights into integrative approaches for respiratory health.

Aim

To critically analyze the association between *Pranavaha Srotas* and functions of *Pranavayu* through Ayurvedic literature and modern physiological correlation.

Objectives

1. To review classical descriptions of *Pranavaha Srotas*.
2. To analyze the physiological functions attributed to *Pranavayu*.
3. To correlate Ayurvedic concepts with modern respiratory physiology.
4. To identify research gaps and future scope.

2. Methodology of Literature Review

A narrative literary review was conducted.

Ayurvedic Classical Sources

The following texts were reviewed:

- *Charaka Samhita*
- *Sushruta Samhita*
- *Ashtanga Hridaya*
- *Ashtanga Sangraha*
- *Madhava Nidana*

Modern Databases

Electronic literature search was conducted using:

- PubMed
- Scopus

- Web of Science
- Google Scholar

Keywords Used

“Pranavaha Srotas”

“Pranavayu function”

“Ayurvedic respiratory physiology”

“Vata and respiratory system”

“Prana and nervous regulation”

Inclusion Criteria

- Classical Ayurvedic references
- Peer-reviewed physiological studies
- Respiratory physiology literature
- Conceptual correlation studies

Exclusion Criteria

- Non-authenticated references
- Articles unrelated to respiratory physiology
- Non-scientific sources

3. Historical and Conceptual Background

Concept of Srotas in Ayurveda

Srotas refers to channels responsible for transportation and transformation of substances within the body.

According to Ayurveda:

“Srotomayam hi shariram”

The body is considered a network of multiple channels maintaining physiological functions [5].

Srotas perform functions including:

- Transportation
- Nourishment
- Elimination
- Communication between tissues

4. Concept of Pranavaha Srotas

Pranavaha Srotas is one of the important functional channels responsible for carrying *Prana*.

According to *Charaka Samhita*, the roots (*Mula*) of *Pranavaha Srotas* are:

- Heart (*Hridaya*)
- Mahasrotas [6]

This description indicates that *Prana* is not limited to lungs alone but represents an integrated physiological system involving:

- Respiration
- Circulation
- Nervous regulation

Functions of Pranavaha Srotas

The major functions include:

1. Inspiration and expiration
2. Maintenance of life
3. Supply of oxygen-like vital energy
4. Coordination of sensory and motor functions

5. Concept of *Pranavayu*

Pranavayu is one of the five subdivisions of *Vata Dosha*.

The location of *Pranavayu* includes:

- Head region
- Chest
- Heart
- Throat [7]

Functions of *Pranavayu*

1. Respiration (*Shwasa*)

Pranavayu controls inhalation and exhalation.

Modern correlation:

- Pulmonary ventilation
- Diaphragmatic movement
- Respiratory center regulation

The medulla and pons regulate respiratory rhythm through neural impulses [8].

2. Speech (*Vak Pravritti*)

Ayurveda attributes speech production to *Prana Vayu*.

Modern correlation involves:

- Respiratory airflow
- Laryngeal vibration
- Neuromuscular coordination

Speech requires coordinated function of:

- Lungs
- Vocal cords
- Nervous system

3. Swallowing Function

Pranavayu assists swallowing.

Modern correlation:

Swallowing involves:

- Pharyngeal muscles
- Cranial nerves
- Respiratory coordination

4. Sensory and Mental Functions

Prana supports:

- Awareness
- Sensory perception
- Cognitive activity

Modern physiology correlates this with:

- Brain oxygenation
- Neural metabolism
- Autonomic regulation [9]

6. Association Between *Pranavaha Srotas* and Modern Respiratory Physiology

Modern respiratory physiology includes:

A. Ventilation

Movement of air into and out of lungs.

Ayurvedic correlation:

Pranavayu controlling *Shwasa-Prashwasa*.

B. Gas Exchange

Oxygen enters blood and carbon dioxide is removed.

Correlation:

Prana sustaining cellular function.

C. Circulatory Integration

The association of *Hridaya* with *Pranavaha Srotas* suggests involvement of cardiovascular regulation.

Modern correlation:

Heart-lung interaction maintains oxygen delivery.

D. Neural Regulation

Respiration is controlled by:

- Brainstem respiratory centers
- Autonomic nervous system

This corresponds with the regulatory function of *Pranavayu*.

7. Pathological Perspective

Impairment of *Pranavaha Srotas* is described through symptoms such as:

- Difficulty breathing
- Cough
- Chest discomfort
- Abnormal respiration [10]

Modern correlation:

Ayurveda	Modern Interpretation
<i>Srotodushti</i>	Functional disturbance
<i>Prana Vaigunya</i>	Respiratory dysregulation

Shwasa	Dyspnea
Kasa	Cough disorder

8. Pathophysiological Correlation Between *Pranavaha Srotas Dushti* and Modern Respiratory Disorders

According to Ayurveda, disturbance of *Pranavaha Srotas* occurs due to improper diet, lifestyle abnormalities, suppression of natural urges, exposure to environmental factors, and imbalance of *Doshas* [10]. The pathology involves impairment of normal flow of *Prana*, resulting in respiratory symptoms.

The classical features of *Pranavaha Srotas Dushti* include:

- *Atisrishta Shwasa* (excessively deep breathing)
- *Atibaddha Shwasa* (obstructed breathing)
- *Kupita Shwasa* (disturbed respiration)
- *Alpa Shwasa* (reduced breathing capacity)
- *Abhikshna Shwasa* (frequent breathing) [6]

These can be correlated with modern respiratory abnormalities.

Ayurvedic–Modern Correlation

Ayurvedic Concept	Modern Physiological Interpretation
<i>Pranavaha Srotas</i>	Respiratory system + circulatory and neural regulation
<i>Pranavayu</i>	Respiratory drive and autonomic control
<i>Shwasa</i>	Respiration/ventilation
<i>Kasa</i>	Cough reflex
<i>Srotorodha</i>	Airway obstruction
<i>Dhatukshaya</i>	Tissue hypoxia and reduced cellular function

9. Role of *Pranavayu* in Maintaining Homeostasis

The function of *Pranavayu* extends beyond respiration. Ayurveda describes it as the primary force coordinating multiple physiological activities.

9.1 Regulation of Respiration

The respiratory cycle involves:

- Inspiration
- Expiration
- Rhythm maintenance

The brainstem respiratory center controls breathing through neural pathways [11].

The Ayurvedic description of *Pranavayu* regulating *Shwasa-Prashwasa* may be interpreted as the integrated function of:

- Respiratory centers
- Diaphragm
- Intercostal muscles
- Autonomic nervous system

9.2 Relationship with Cardiovascular System

The classical association of *Pranavaha Srotas* with *Hridaya* suggests a functional relationship between respiration and circulation [6].

Modern physiology confirms that:

- Oxygen exchange occurs between lungs and blood
- Cardiac output determines tissue oxygen delivery
- Heart and lungs function as a coordinated unit

Thus, *Prana* can be understood as a physiological representation of oxygen-dependent life processes.

9.3 Relationship with Nervous System

Pranavayu is described as supporting:

- Consciousness
- Sensory perception
- Mental activity [3]

Modern science recognizes that adequate oxygenation is essential for:

- Neuronal metabolism
- Cognitive function
- Brain activity

Hypoxia results in:

- Confusion
- Reduced cognition
- Neurological dysfunction

10. Role of *Pranavayu* in Speech and Communication

Ayurveda attributes *Vak Pravritti* (speech production) to *Pranavayu* [7].

Speech requires:

1. Respiratory airflow
2. Laryngeal vibration
3. Oral articulation

4. Neuromuscular coordination

Therefore, the classical concept of *Pranavayu* incorporates the physiological relationship between respiration and communication.

11. Association with Immunity and Disease Resistance

Ayurveda considers proper functioning of *Prana* essential for maintaining vitality (*Ojas*) and resistance against disease (*Vyadhikshamatva*) [12].

Modern research demonstrates that respiratory function influences:

- Immune cell activity
- Inflammatory response
- Tissue oxygenation

Chronic respiratory dysfunction is associated with:

- Increased inflammation
- Oxidative stress
- Reduced immunity [13]

12. Role of Lifestyle and Yoga in Maintaining *Pranavaha Srotas*

Ayurveda emphasizes lifestyle regulation for maintaining normal flow of *Prana*.

Pranayama

Pranayama regulates breathing patterns and improves respiratory efficiency.

Modern studies suggest that breathing practices may improve:

- Lung function
- Heart rate variability
- Autonomic balance
- Stress regulation [14]

Dinacharya

Proper daily routine supports:

- Stable biological rhythms
- Balanced *Dosha*
- Normal respiratory function

13. Discussion

The concept of *Pranavaha Srotas* represents a comprehensive physiological model integrating respiration, circulation, and neural regulation. Unlike the modern anatomical approach that separates organ systems, Ayurveda describes respiration as a functional network controlled by *Pranavayu*.

The classical statement that *Prana* sustains life may be correlated with oxygen-dependent cellular metabolism. Oxygen availability

determines mitochondrial energy production, tissue functioning, and survival.

The relationship of *Pranavaha Srotas* with *Hridaya* suggests that Ayurveda recognized the cardiopulmonary interdependence. Modern medicine similarly considers heart and lungs as a single functional unit responsible for oxygen transport.

However, direct one-to-one correlation between *Prana* and oxygen should be avoided because *Prana* also includes subtle physiological and regulatory aspects beyond physical respiration.

The concept of *Pranavayu* may represent an integrated function involving:

- Respiratory regulation
- Autonomic nervous control
- Cognitive functions
- Vital energy maintenance

This interdisciplinary interpretation provides a broader understanding of respiratory physiology.

14. Research Gaps and Limitations

Although classical descriptions of *Pranavaha Srotas* are extensive, several limitations exist:

1. Limited experimental validation of Ayurvedic concepts
2. Lack of standardized biomarkers for *Prana* assessment
3. Difficulty correlating subtle concepts with measurable physiological parameters
4. Limited clinical research exploring *Pranavayu* function

Future studies should focus on:

- Respiratory physiology and Ayurvedic parameters
- Heart rate variability studies
- Neuro-respiratory correlation
- Clinical evaluation of *Pranavaha Srotas* disorders

15. Future Perspectives

Future research may include:

- Development of Ayurvedic respiratory assessment tools
- Correlation of *Prakriti* with respiratory physiology
- Clinical studies on *Pranayama* and pulmonary function
- Integration of Ayurveda with respiratory medicine

Modern technologies such as:

- Pulmonary function testing
- Functional MRI
- Autonomic nervous system analysis

may help scientifically evaluate concepts related to *Prana*.

16. Conclusion

The association between *Pranavaha Srotas* and *Pranavayu* represents a fundamental Ayurvedic explanation of respiratory physiology and life-sustaining mechanisms. The functions attributed to *Pranavayu* including respiration, speech, swallowing, sensory activity, and mental regulation demonstrate parallels with modern respiratory, neurological, and cardiovascular physiology. Although *Prana* cannot be limited only to oxygen or respiration, it may be interpreted as a broader physiological regulatory principle. Understanding *Pranavaha Srotas* through both classical and modern perspectives may provide a comprehensive framework for respiratory health and disease management.

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