

<https://doi.org/10.46344/JBINO.2026.v15i01.03>

PRANAVAHA SROTAS: A PHYSIOLOGICAL AND AYURVEDIC REVIEW

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ABSTRACT

Pranavaha Srotas represents the fundamental channel system responsible for respiration, vitality exchange, cellular oxygenation, and sustenance of life. Classical Ayurvedic texts describe *Prana* as the primary force governing consciousness, breathing, cardiac rhythm, and neurological coordination. In modern physiology, these functions correlate with pulmonary ventilation, gas exchange, cardiovascular oxygen transport, and neuronal autonomic regulation. Disruption of *Pranavaha Srotas* manifests as *Shwasa*, *Kasa*, *Hridroga*, *Pranavaha Sroto-Dushti* and systemic depletion of *Ojas*. This review integrates classical Ayurvedic formulations with contemporary respiratory and cardiovascular science, exploring structural and functional analogies between *Pranavaha Srotas* and the cardiopulmonary axis—lungs, tracheobronchial passages, alveoli, heart, and vascular network. Additionally, etiological factors, pathological progression, *Samprapti*, diagnosis, and therapeutic interventions are discussed. A special focus is placed on *Pranayama*, *Nasya*, *Rasayana**, Vata-Pitta modulation, and lifestyle regulation to maintain efficiency of *Pranavaha* pathways.

Keywords: *Prana, Pranavaha Srotas, Shwasa, Kasa, Cardiopulmonary physiology, Vayu, Udana, Avalambaka Kapha, Ayurveda respiration.*

Introduction

Ayurveda conceptualizes *Prana* as the governing force behind life, intellect, respiration, cardiac pulsation, and psychosomatic synchronization. It nourishes sensory perception, stabilizes consciousness, regulates mental clarity, and maintains cellular vitality. The channels carrying this essential life-force are termed *Pranavaha Srotas*—the root system of breath and cardiac activity.

Modern clinical sciences acknowledge that interruption of oxygenation, ventilation, cardiac perfusion, or neural respiratory drive leads to rapid systemic collapse. The same urgency is reflected in Ayurvedic verses which state that derangement of *Prana* becomes life-threatening within moments [1]. Thus, understanding *Pranavaha Srotas* is foundational for both preventive and curative medicine.

Materials & Methods

This review is based on:

1. Charaka Samhita, Sushruta Samhita, Ashtanga Hridaya descriptions of *Prana*, *Srotas*, *Shwasa-Kasa* and related disorders.

2. Modern research papers on respiratory physiology, oxygen diffusion, autonomic regulation, immune and inflammatory pathways.
3. Comparative evaluation linking Ayurvedic Dosha pathology with pulmonary and cardiovascular mechanisms.
4. Epidemiological overview of respiratory burden and therapeutic significance of *Srotas* maintenance.

Data synthesis follows a conceptual, analytical approach rather than a statistical meta-analysis.

Anatomy & Physiology of *Pranavaha Srotas*

Anatomical Roots

Classical texts state *Hrudaya* (heart) and *Mahasrotas* (lungs or respiratory passages) as *Moola* (roots) of *Pranavaha Srotas* [2]. Correlation with modern physiology:

Ayurvedic Structure	Modern Equivalent	Function
<i>Hrudaya</i>	Heart	Circulates oxygenated blood to tissues
<i>Mahasrotas</i> / <i>Urastha Srotas</i>	Trachea, Bronchi, Lungs	Conduct and exchange gases
<i>Nasa-Kantha</i>	Nasal cavity, Larynx	Air purification, warming, voice regulation
<i>Siras & Dhamanis</i>	Pulmonary & systemic vessels	Transport oxygen & CO ₂

Functional Insights

- Governs breathing rhythm, expansion–contraction of lungs
- Maintains gas exchange, oxygenation & CO₂ elimination
- Sustains neurocognitive clarity and consciousness
- Supports cardiac endurance, circulation & cellular metabolism

Ayurveda views breathing not only as mechanical ventilation, but as the primary energetic interface between human physiology and environment.

Dosha Influence on Pranavaha Srotas**Vata — Primary Controller**

Vyana Vayu and Prana Vayu maintain respiratory rhythm, neurological drive and diaphragmatic motion.

Pitta — Gas Exchange & Metabolic Oxygenation

Sadhaka Pitta supports cardiac activity, Ranjaka Pitta sustains haemoglobin-mediated oxygen delivery.

Kapha — Structural Stability

Avalambaka Kapha lines alveoli, lubricating bronchi and preventing tissue dryness.

Disruption of any component destabilizes the entire *Pranavaha* axis.

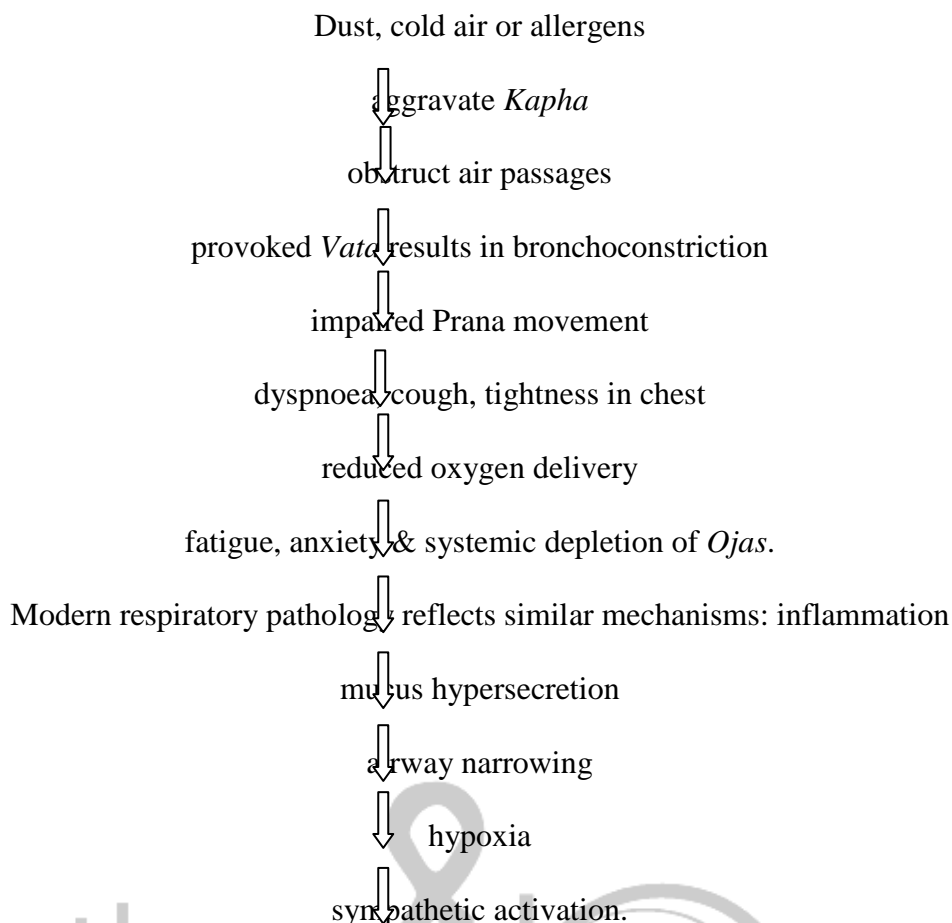
Etiology (Nidana) of Pranavaha Sroto-Dushti

Common causative factors described include [3]:

- Exposure to *Raja*, *Dhuma* (pollution, smoke, fumes)
- Cold, dry, heavy, or incompatible foods
- Suppression of natural urge of breathing (*Vega Dharana*)
- Excessive talking, shouting, vocal strain
- Sedentary lifestyle, obesity, stress, poor posture
- Allergens, infections, climate change

These stimuli aggravate *Vata* and *Kapha* dominance, leading to mucosal obstruction, bronchospasm and impaired oxygen transport.

Samprapti (Pathogenesis)



Clinical Manifestations

Symptoms include:

- Shwasa (dyspnea, short breath)
- Kasa (cough)
- Chest stiffness, shallow breathing
- Fatigue, low stamina
- Rapid pulse, anxiety
- Reduced voice clarity (Swarabheda)

Chronic depletion manifests as generalized weakness, loss of complexion, disturbed sleep, poor immunity, and susceptibility to infections.

Management of Pranavaha Srotas

Ayurvedic treatment strives to restore Srotas patency, pacify aggravated Dosha and nourish Prana.

1. Shodhana (Eliminative Therapy)

- Vamana for Kapha-dominant congestion
- Virechana in Pitta-related inflammatory asthma
- Nasya for nasal-sinus channel purification
- Raktamokshana in inflammatory chest conditions

2. Shamana (Palliative Therapy)

- Warm, unctuous diet
- Light, digestible meals
- Kashaya like Vasaka, Kantakari, Dashmoola
- Shrungyadi Agada in toxic-triggered dyspnea

3. Rasayana for Prana Strengthening

Herb / Formulation	Benefit
Ashwagandha	Adaptogenic, strengthens nervous tone
Shatavari	Soothes mucosa, balances Pitta
Pippali Rasayana	Increases lung capacity and Agni
Pushkarmoola	Cardio-respiratory stimulant
Chyawanprash	Improves Ojas & immunity

4. Pranayama & Yogic Integration

Breathing practices directly purify and expand *Pranavaha Srotas*:

- *Anulom-Vilom* → balances sympathetic/parasympathetic output
- *Bhastrika* → improves alveolar ventilation
- *Bhramari* → reduces airway resistance, calms neural drive
- *Ujjayi* → strengthens respiratory musculature

Daily practice significantly improves VO_2 capacity and vagal tone.

Discussion

Pranavaha Srotas is more than a physiological respiratory network—it is the energetic infrastructure sustaining life. Modern pulmonology validates a large portion of Ayurvedic understanding regarding airway integrity, thoracic expansion, gas exchange, capillary perfusion and inflammation-driven obstruction.

Where modern medicine targets bronchial relaxation or immunity suppression, Ayurveda focuses on *root-level balance* of *Vata-Kapha*, strengthening lung tissue, enhancing cellular oxygen utilization, and restoring *Srotas* fluidity. The inclusion of *Pranayama*, *Rasayana*, controlled nutrition, and mindful breathing imparts

long-term resilience rather than short-term relief.

Future work should analyse biomarkers such as IgE levels, TNF- α , IL-6, oxidative stress indicators, lung diffusion capacity, and cardiac output variations in response to Ayurvedic interventions.

Conclusion

Efficient functioning of *Pranavaha Srotas* is essential for respiration, vitality, cardiac integrity, mental clarity and systemic health. Ayurvedic science offers a complete framework—diagnostic, preventive and curative—to maintain *Srotas* purity and *Pranic* flow. By combining classical interventions with modern respiratory science, integrative management becomes more effective, rational, and research-ready.

Strengthening *Pranavaha Srotas* through lifestyle regulation, controlled breathing, herbal *Rasayana* and *Dosha*-aligned therapies has potential to significantly reduce respiratory morbidity in modern populations.

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