



Ayurvedic Perspectives on Respiration: A Review of *Prana Vayu and Pranavaha Srotas*

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Received on 05/01/2025

Accepted on 02/02/2025

Reviewed on 1/08/2025

Published on 15/09/2025

Abstract:

Respiration has long been perceived as the essence of life. Ancient Ayurvedic scholars described the process of respiration in ways that parallel the explanations of modern medical science. In Ayurveda, the function of *Prana Vayu* is considered responsible for regulating respiration in the human body. The channels or pathways (*Srotas*) through which *Prana Vayu* flows are referred to as *Pranavaha Srotas*. *Prana Vayu* is often compared to atmospheric oxygen, which is essential for sustaining the vital functions of life.

Keywords: *Prana Vayu, Pranavaha Srotas, Swasa Kriya.*

INTRODUCTION

Respiration is a fundamental physiological process essential for the maintenance of life. It provides the body with oxygen, which is critical for cellular metabolism, and facilitates the removal of carbon dioxide, a by-product of metabolic activity¹. Modern medical science explains respiration through anatomical structures such as the lungs, bronchi, and alveoli, and their physiological functions in gas exchange². However, the concept of respiration is not limited to modern physiology alone; traditional systems of medicine, such as Ayurveda, have long emphasized its importance in sustaining life.

In Ayurvedic literature, the function of *Prana Vayu* is considered the driving force behind the process of respiration. *Prana Vayu*, one of the five subdivisions of *Vata Dosha*, regulates vital activities such as breathing, swallowing, and the functioning of sensory and motor organs³. The channels through which *Prana Vayu* flows are described as *Pranavaha Srotas* in classical texts, with their roots (*Mula*) in the *Hridaya* (heart) and *Mahasrotas* (respiratory passages)⁴. These descriptions closely parallel the respiratory pathways recognized in modern medicine. Furthermore, *Prana Vayu* is often compared to atmospheric oxygen, highlighting its indispensable role in sustaining the essential functions of life⁵.

The descriptions of respiration provided by ancient Ayurvedic scholars demonstrate remarkable similarity with modern scientific understanding. Although the terminology and conceptual framework differ, both perspectives converge on the idea that respiration is central to vitality and survival. This convergence underscores the relevance of Ayurveda in offering insights

into physiological processes that continue to hold importance in contemporary times.

Significance of the Study: Exploring the Ayurvedic perspective on respiration is valuable not only for appreciating the depth of traditional medical knowledge but also for fostering integrative approaches that bridge classical concepts with modern biomedical science. By examining the role of *Prana Vayu* and *Pranavaha Srotas* in relation to contemporary respiratory physiology, this review aims to highlight both the uniqueness and the universality of the Ayurvedic approach.

Objectives:

1. To review the Ayurvedic concepts of respiration with a focus on *Prana Vayu* and *Pranavaha Srotas*.
2. To analyze the similarities and distinctions between Ayurvedic descriptions and modern physiological explanations of respiration.
3. To emphasize the relevance of Ayurvedic perspectives in the context of present-day scientific discourse.

References (Vancouver Style with Shloka References)

Swarupa and Functions of Prana Vayu

The *Swarupa* of *Prana Vayu* is understood through its functions rather than direct perception, as *Vata* in nature and in the human body are not *Pratyakshagamy* (directly perceptible). *Prana Vayu* plays a crucial role in the process of respiration.

Sites of Prana Vayu: The primary seats of *Prana Vayu* are the head and chest, though classical texts also describe its presence in the throat, mouth, tongue, nose, heart, mind, and intellect^{6,7}. The *Pranas* of living beings are also said to reside in the umbilical region (*Nabhi*), which is surrounded by *Siras* (vessels) in the same way that the hub of a wheel is surrounded

by spokes⁸. As *Siras* carry *Prana* from the heart to all parts of the body, they are considered fundamental seats of *Prana*.

Functions of Prana Vayu: *Prana Vayu* governs essential activities such as respiration, swallowing, sensory perception, and cognition. The five major *Vayus*—*Prana*, *Udana*, *Samana*, *Vyana*, and *Apana*—share interrelated functions^{9,10}

- Praspandanam (movement of the body) – function of *Vyana Vayu*.
- Udvahanam (upward conduction of sensations) – function of *Udana Vayu*.
- Puranam (filling the stomach with food) – function of *Prana Vayu*.
- Vivekah (separation of essence and waste) – function of *Samana Vayu*.
- Dharanam (retention and expulsion of semen, urine, and feces) – function of *Apana Vayu*.

In addition, *Agni* (digestive fire) is maintained by the combined activity of *Prana*, *Apana*, and *Samana Vayu*¹¹. Proper functioning of *Prana Vayu* ensures balanced activity of the heart, brain, intellect, and sensory organs, supporting higher faculties such as *dhi* (discrimination), *dhriti* (courage), and *smriti* (memory)¹². Disturbances in inward movement of *Prana Vayu* can result in disorders such as *Shwasa* (asthma), while other manifestations include coughing, sneezing, and hiccups.

Pranavaha Srotas and Swasana Samsthana (Respiratory System)

Srotas are channels through which various constituents and nutrients of the body flow. Among them, *Pranavaha Srotas* is described as the vital channel responsible for the conveyance of *Prana*, which sustains every activity of the organism. *Charaka Samhita* identifies the *Hridaya*

(heart) and *Mahasrotas* (respiratory passages) as the *Mula* (roots) of *Pranavaha Srotas* and describes respiratory disorders (*Shwasa*) when these channels are vitiated¹³. *Gangadhara Tika* interprets the seats of *Pranavaha Srotas* as the heart and lungs¹⁴.

Chakrapani comments that the pathway of *Vayu* circulating as *Pranavaha* constitutes these channels. With the support of *Vyana Vayu*, *Sadhaka Pitta* in the heart, and *Avalambaka Kapha* in the lungs, *Pranavaha Srotas* ensure proper circulation of *Prana*¹⁵. In contrast, *Sushruta Samhita* describes two *Pranavaha Srotas* originating from the heart and *Rasavahini Dhamanis* (nutritive channels), interpreted by some as corresponding to pulmonary arteries and bronchi¹⁶.

Functions and Formation of *Pranavaha Srotas*

The physiological importance of *Pranavaha Srotas* surpasses that of other *Srotas*, as they are directly linked with the sustenance of life. The nourishment and proper functioning of all *Vayus* depend upon *Prana Vayu*. Obstruction, depletion, or vitiation of *Pranavaha Srotas* can lead to derangement of *Dhatu*s and *Malas*, ultimately manifesting as systemic disease.

Formation of *Pranavaha Srotas* is closely linked with *Rakta Dhatu*, one of the *Saptadhatu*s. *Rakta* is regarded as a carrier of *Prana*, supplying vital energy (*Pranashakti*) to every organ, tissue, and cell^{17,18}. Thus, depletion of blood or impairment in its circulation directly threatens life, hence *Rakta* is described as *Jivana*.

Shwasa Kriya: Mechanism of Respiration

Vedic literature also alludes to respiration, describing *Prana* (inspiration) and *Apana* (expiration) as entering through the nostrils (*Yajurveda* 15/12). *Ayurveda* recognizes

Shwasa Kriya as a continuous process of *Nishwasa* (inhalation) and *Uchhwasa* (exhalation), dependent primarily on *Prana Vayu* and *Udana Vayu*. The nasal passages, windpipe, bronchi, and alveoli (*Vayu Koshas*) are lined with mucous membranes that secrete *Avalambaka Kapha*, which provides lubrication, protection, and strength.

Sharangadhara Samhita describes normal respiration as originating from the *Nabhi Pradesha* (umbilical region), traveling upward through the heart and lungs, and returning again after acquiring oxygen (*Ambarpiyusha*) from atmospheric air (Sha. Pu. 5/89–99). This description parallels the modern understanding of diaphragmatic activity in inspiration and expiration, pulmonary gas exchange, and circulation of oxygenated blood from the lungs to the heart¹⁹.

Rate of Respiration

Ayurvedic literature generally does not provide a detailed discussion of respiratory rate. However, ancient Yogic and Upanishadic texts describe systematic estimations of breathing cycles. The term *Swasanamana* refers to the number of breaths per day. *Yoga Chudamani Upanishad* mentions 21,600 breaths in 24 hours, which equates to approximately 15 breaths per minute²⁰. Similarly, *Shatapatha Brahmana* also describes the average respiratory rate as 15 per minute²¹.

Although precise measurements of tidal volume or minute ventilation are not given in Ayurvedic texts, Yogic literature associates one full cycle of *Pranayama* with 12 *angulis* (finger-breadths) as a measure of breath depth²². This indicates that ancient traditions had a conceptual understanding of both rate and depth of respiration, in line with modern

physiology's average adult respiratory rate of 12–18 breaths per minute²³.

Regulation of Respiration

Modern physiology attributes the primary control of breathing to neuronal networks in the medulla oblongata and pons. These centers respond to excitatory and inhibitory inputs, with the pneumotaxic center modulating the activity of the medullary inspiratory neurons²⁴.

In Ayurveda, *Prana Vayu*, located at *Murdha* (head/brain), is said to regulate respiration (*Swasa Karma*) and related reflexes such as sneezing (*Ksavathu*)^{25,26}. According to *Charaka Samhita*, abnormal increases or decreases in the rate of respiration (*Swasana*) are manifestations of *Vata Dosh Avarana* (obstruction of Vata by other Doshas)²⁷. Thus, the ancient texts recognized that respiration was centrally regulated, with disturbances linked to imbalances in *Prana Vayu*.

Health (*Swasthya*) in Ayurveda is described as the state of *Dhatusamyā*—homeostatic equilibrium among body systems²⁸. *Prana Vayu* plays a central role in sustaining this balance, as respiration ensures the supply of oxygen to tissues. The act of respiration (*Swasana*) is described as a vital carrier of *Prana Vayu* (*Nabhistha Prana Pawanah*), which is indispensable for life²⁹.

Conclusion

The *Chandogya Upanishad* emphasizes that while a person may survive without sensory faculties or limbs, life cannot be sustained without breath and food, as both are fundamental for survival³⁰. This reflects the centrality of *Prana*—the vital force—and its physical manifestation through respiration.

Modern physiology describes the lungs as the organs responsible for gaseous exchange, while Ayurveda frames the respiratory passages as conduits of *Prana Vayu*. Both perspectives underscore the indispensability of respiration.

Maintaining respiratory health is emphasized in Ayurveda. Improper diet, seasonal changes, polluted air, and sedentary lifestyle are considered causes of respiratory disorders^{31,32,33}. Preventive and supportive measures include dietary

regulation (light meals, avoidance of heavy/fried foods), warm water consumption for decongestion, and the use of lung-supportive herbs such as *Pippali* (*Piper longum*), *Guduchi* (*Tinospora cordifolia*), *Shati* (*Hedychium spicatum*), and *Pushkarmoola* (*Inula racemosa*)^{34,35}. Regular physical exercise, yoga, meditation, and especially *Pranayama* is highlighted as effective methods for cleansing the respiratory passages, strengthening the lungs, and maintaining optimal respiratory function^{36,37}.

Summarised table 1.

Ayurvedic Concept	Description in Ayurveda	Modern Correlation	Functional Significance
<i>Prana Vayu</i>	Governs respiration, swallowing, cognition, inward movement of <i>Vata</i> ; located in head, chest, heart, throat, nose (<i>Charaka Samhita, Sutra Sthana 28/4–6</i>)	Neural control of respiration via brainstem centers (medulla, pons); autonomic regulation of breathing	Maintains vital functions like breathing, swallowing, perception, and coordination of sensory-motor pathways
<i>Udana Vayu</i>	Responsible for upward movement, speech, exhalation, effort (<i>Charaka Vimana Sthana 5/8–9</i>)	Expiratory phase of respiration; active role of abdominal and intercostal muscles	Provides forceful expiration, speech, and upward propulsion of energy
<i>Samana Vayu</i>	Governs digestion and separation of essence and waste (<i>Viveka</i>); supports <i>Agni</i>	Gastrointestinal digestion and absorption; coordination with diaphragm movement during breathing	Links respiration with metabolism and energy extraction
<i>Vyana Vayu</i>	Circulates <i>Prana</i> throughout the body via <i>Hridaya</i> and <i>Siras</i>	Cardiac output and systemic blood circulation distributing oxygen	Ensures oxygenated blood reaches all tissues
<i>Apana Vayu</i>	Governs downward elimination (faeces, urine, semen, menstruation, foetus)	Expulsive reflexes (cough, sneezing, defecation, micturition); intra-abdominal pressure	Maintains clearance functions; supports respiratory reflexes
<i>Pranavaha Srotas</i> (<i>Mula: Hridaya & Mahasrotas</i>)	Channels of <i>Prana</i> linked to <i>Hridaya</i> (heart) and respiratory tract (lungs) (<i>Charaka Vimana 5/7; Sushruta Sharira 9/12–13</i>)	Respiratory passages (nasal cavity, trachea, bronchi, lungs); cardiovascular–pulmonary connection	Essential for transport of air and circulation of vital energy
<i>Avalambaka Kapha</i>	Lubricates and supports <i>Hridaya</i> and <i>Phuphusa</i> ; prevents collapse of structures	Pleural fluid, surfactant secretion in alveoli	Maintains structural stability and prevents alveolar collapse
<i>Rakta Dhatu</i>	Carrier of <i>Prana</i> (oxygenated vitality) to tissues (<i>Charaka Sutra 30/12</i>)	Haemoglobin in red blood cells transporting oxygen	Vital link between respiration and cellular metabolism

Ayurvedic Concept	Description in Ayurveda	Modern Correlation	Functional Significance
Nabhi (umbilical region)	Seat of Prana, initiating diaphragmatic movement (<i>Sharangadhara Purva Khanda 5/89–99</i>)	Diaphragm as the chief muscle of inspiration	Central role in inspiration and respiratory rhythm
Shwasa Kriya (Nishwasa & Ucchwasas)	Continuous process of inspiration and expiration governed by Prana and Udana Vayu	Pulmonary ventilation cycle	Fundamental process sustaining life

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Source of support: Nil
Conflict of interest: None Declared

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