

A COMPREHENSIVE REVIEW OF MUTRAUTPATTI: UNDERSTANDING URINE FORMATION THROUGH AYURVEDIC PHYSIOLOGY

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ABSTRACT

Background: In *Ayurveda*, the physiological process of urine formation, termed *Mutrautpatti*, is an intricate mechanism involving the functional interplay of *Apana Vata*, *Mutravaha Srotas*, *Rasa Dhatu*, *Meda Dhatu*, and *Agni*. Classical texts like *Charaka Samhitā*, *Suśruta Samhitā*, and *Ashtanga Hridaya* offer comprehensive insights into the origin, transformation, and expulsion of *Mutra* (Urine). This review aims to decode the Ayurvedic understanding of urine formation and correlate it with modern renal physiology. **Aim:** To explore and analyze the concept of *Mutrautpatti* (Urine formation) as described in classical *Ayurvedic* texts and correlate it with modern renal physiology. **Objectives:** To review classical references related to *Mutrautpatti* from *Ayurvedic* literature. To understand the role of *Mutravaha Srotas*, *Apana Vata*, and *Dhatu Parinama* in urine formation. To compare the Ayurvedic concept of urine formation with modern anatomical and

physiological mechanisms. To highlight the clinical relevance of *Ayurvedic* understanding in urinary disorders. To provide an integrative perspective on urine physiology for educational and clinical application. **Materials and Methods:** This conceptual review is based on a thorough literary analysis of classical *Ayurvedic* texts (*Brhatrayi*, *Laghutrayi*, and relevant commentaries) alongside current modern physiology literature. Sources were selected from published research articles, textbooks, and peer-reviewed journals to draw parallels and contrasts between traditional and modern views on urine formation. **Results:** The review reveals that *Mutrautpatti* is described as the by-product of *Rasa* and *Meda Dhatu* metabolism, with *Apana Vata* playing a regulatory role in the collection and expulsion of *Mutra*. The

Mutravaha Srotas originating from the *Basti* and *Medovaha Dhamanis* correspond to the anatomical and functional aspects of kidneys, ureters, and bladder. The concept of *Srotodushti* also explains various urinary disorders. **Discussion:** The Ayurvedic view provides a functional understanding of urine formation through doshic, *srotasic*, and *dhatu*-related pathways rather than purely anatomical structures. The roles of *Agni*, *Srotas*, and *Vata Dosha* particularly *Apana Vata*, in excretory regulation offer a holistic perspective that is both preventive and therapeutic in nature. **Conclusion:** The Ayurvedic concept of *Mutrautpatti* integrates multiple physiological domains, offering a systemic and functional perspective on urine formation. Its clinical applications in understanding disorders like *Mutrakrichchhra*, *Mutraghata*, and *Prameha* highlight its relevance in current renal health paradigms.

KEYWORDS: *Mutrautpatti*, *Mutravaha Srotas*, *Apana Vata*, *Agni*, *Dhatu Parinama*, Urine Formation.

INTRODUCTION

The science of *Ayurveda* provides a holistic and multidimensional approach to understanding the physiology of the human body. Among the key excretory functions discussed in classical texts is the process of *Mutrautpatti* (Urine formation), which is not merely a waste elimination mechanism but a crucial reflection of internal metabolic processes and *Dosha* balance.^[1] Urine (*Mutra*) is considered a *Mala* (Waste product) of *Rasa* and *Meda Dhatus*, and its proper formation and excretion are essential for maintaining *Sharira Dhatu Samya* (Physiological equilibrium).^[2]

The concept of *Mutravaha Srotas* is central to urine physiology in *Ayurveda*. According to *Charaka Samhitā*, the roots (*Mula*) of these channels lie in the *Basti* (Urinary bladder) and *Medovaha Dhamanis*.^[3] These structures collectively represent the functional anatomy involved in the generation, transportation, and expulsion of *Mutra*. The proper functioning of these *Srotas* ensures the timely removal of metabolic waste and prevents the accumulation of *Ama* and *Dushta Mala*, which are causative factors in many diseases.^[4]

The primary regulator of urinary physiology in *Ayurveda* is *Apana Vata*, a subtype of *Vata Dosha* localized in the pelvic region. It governs the downward movement of urine, stool, and reproductive fluids. Disturbance in the function of *Apana Vata* results in various disorders like *Mutrakrichchhra* (Dysuria), *Mutraghata* (Urinary retention), and *Ashmari* (Urinary

calculi). This highlights the importance of *Vata* regulation in preserving normal urinary function.^[5]

Additionally, *Ayurvedic* texts mention that the quality, quantity, and color of urine are influenced by the dominance of specific *Doshas*. For instance, *Pittaja Mutra* tends to be yellowish and burning, while *Kaphaja Mutra* is cloudy and sticky. Such descriptions provide important diagnostic markers in traditional practice, revealing the role of urinary examination (*Mutra Pariksha*) as a valuable tool in early disease detection and doshic assessment.^[6]

Modern physiology describes urine formation as a function of the kidneys involving glomerular filtration, tubular reabsorption, and secretion. While the anatomical and biochemical details differ, the fundamental aim in both systems remains the same: to eliminate waste and maintain homeostasis. By revisiting the *Ayurvedic* concept of *Mutrautpatti* and interpreting it through a modern lens, this review attempts to bridge traditional wisdom with contemporary scientific understanding for better integrative healthcare approaches.^[7]

AIM AND OBJECTIVES

Aim

To explore and analyze the concept of *Mutrautpatti* (Urine formation) as described in classical *Ayurvedic* texts and correlate it with modern renal physiology.

Objectives

1. To review classical references related to *Mutrautpatti* from *Ayurvedic* literature.
2. To understand the role of *Mutravaha Srotas*, *Apana Vata*, and *Dhatu Parinama* in urine formation.
3. To compare the *Ayurvedic* concept of urine formation with modern anatomical and physiological mechanisms.
4. To highlight the clinical relevance of *Ayurvedic* understanding in urinary disorders.
5. To provide an integrative perspective on urine physiology for educational and clinical application.

MATERIALS AND METHODS

This review is based on a qualitative and conceptual analysis of classical *Ayurvedic* texts and modern medical literature to understand the physiology of urine formation (*Mutrautpatti*) from both traditional and contemporary perspectives.

Source of data

Primary Ayurvedic sources include *Charaka Samhita*, *Sushruta Samhita*, and *Ashtanga Hridaya*, along with their principal commentaries such as *Ayurveda Deepika*, *Nibandha Sangraha*, and *Ghanekar Teeka*. Additional references were taken from *Madhava Nidana*, *Sharngadhara Samhita*, *Bhavaprakasha*, and other authoritative texts. Modern references were collected from standard physiology textbooks, research papers indexed in PubMed and AYUSH Research Portal, and current nephrology literature.^[8]

Concept of *mutrautpatti*

(Urine Formation in Ayurveda)

Etymology

The word *Mutrautpatti* is a compound *Sanskrit* term

- *Mutra* = Urine
- *Ut* = Out or upward
- *Patti* = Arising or production

Thus, *Mutrautpatti* literally means the process of urine formation or the origin of urine.

Definition

In *Ayurveda*, *Mutrautpatti* refers to the physiological mechanism by which urine is formed, transported, stored, and ultimately expelled from the body. It is described as a natural byproduct of metabolic processing of food, particularly from *Rasa Dhatu* and *Meda Dhatu*. This process is governed by the activities of *Apana Vata* and *Mutravaha Srotas*, which play crucial roles in the movement and elimination of *Mutra* (Urine) from the body.^[9]

The term *Mutrautpatti* refers to the physiological process of urine formation in the body. According to *Ayurveda*, urine (*Mutra*) is one of the three primary malas (Waste products) of the body, the other two being *Purisha* (Feces) and *Sveda* (Sweat). The classical texts describe *Mutra* as a byproduct of *Rasa* and *Meda Dhatu* metabolism, formed as part of the process of *Ahara Paka* (Digestion and Tissue nourishment).^[10]

Sources of mutra

- *Mutra* is primarily derived from the *Jala Mahabhuta* (water element) component of digested food.
- The *Agnipaka* of *Ahara Rasa* (Nutritive essence of food) produces nourishing fractions (*Sara*) and waste (*Kitta*). The watery waste portion of this process, combined with the waste products of *Meda Dhatu*, is identified as *Mutra*.^[11]

Involvement of dhatus and doshas

- **Dhatus:** *Mutra* is considered an *upadhatu mala* (secondary waste) of *Rasa* and *Meda Dhatu*.
- **Doshas:** *Apana Vata* plays a crucial role in:
 - Collecting *Mutra* in the *Basti* (Urinary bladder)
 - Governing its timely expulsion
 - Maintaining the directionality of excretion

Role of srotas

- *Mutravaha Srotas* are the channels responsible for urine transportation.
- *Charaka* states their mula (Origin) as *Basti* and *Medovaha Dhamani*.
- *Sushruta* considers *Vrikka* (Kidneys) and *Vasti* (Urinary bladder) as the mula.
- These channels are responsible for:
 - Collecting fluid waste from various parts of the body
 - Filtering and transporting it to the *Basti*
 - Enabling expulsion under the action of *Apana Vata*^[12]

Functional process of mutrautpatti

The overall process can be explained in the following stages:

1. Absorption and filtration of the liquid component of digested food by the *Rasa Dhatu*.
2. Separation of waste (*Kitta Bhaga*) by the action of *Jatharagni* and *Dhatvagni*.
3. Transfer of liquid waste to *Meda Dhatu* and further filtration into *Mutravaha Srotas*.
4. Transport through *Srotas* under the control of *Apana Vata*.
5. Collection in the *Basti*, the organ of urine storage.
6. Expulsion of *Mutra* under the downward force of *Apana Vata*.^[13]

Qualities and Assessment of mutra

The characteristics of *Mutra* such as color, quantity, frequency, and consistency are used diagnostically to assess *Dosha* balance and disease states.

- *Pittaja Mutra*: Yellowish, burning sensation
- *Vataja Mutra*: Scanty, frothy, painful
- *Kaphaja Mutra*: Thick, cloudy, mucoid

These observations are the basis of *Mutra Pariksha* (urine examination) in *Ayurvedic* diagnosis.^[14]

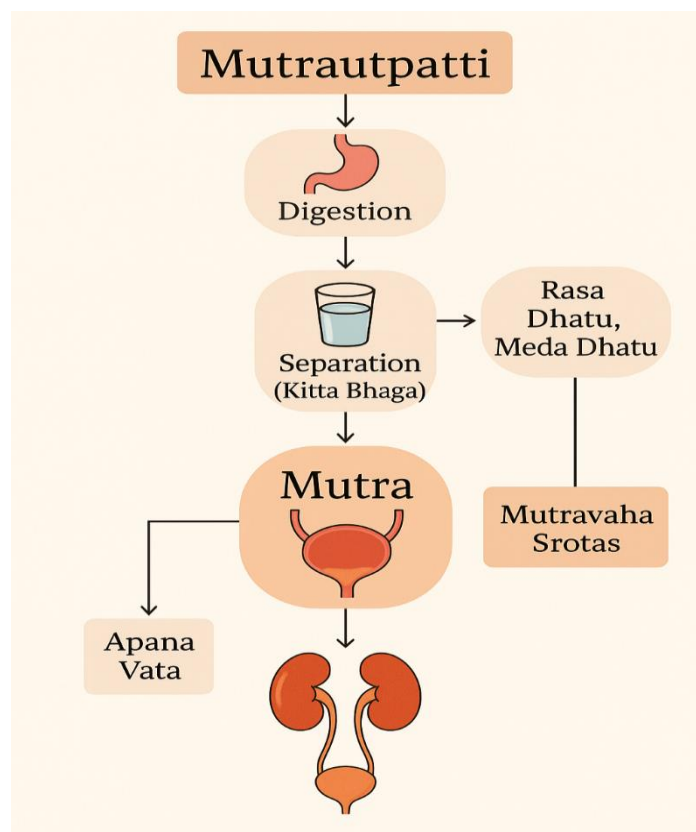
Importance of apana vata

- Resides in the lower abdomen
- Responsible for:
- Micturition
- Defecation
- Menstruation
- Childbirth
- Its dysfunction leads to *Mutrakrichchhra* (Dysuria), *Mutraghata* (Retention), and *Ashmari* (Stone formation)^[15]

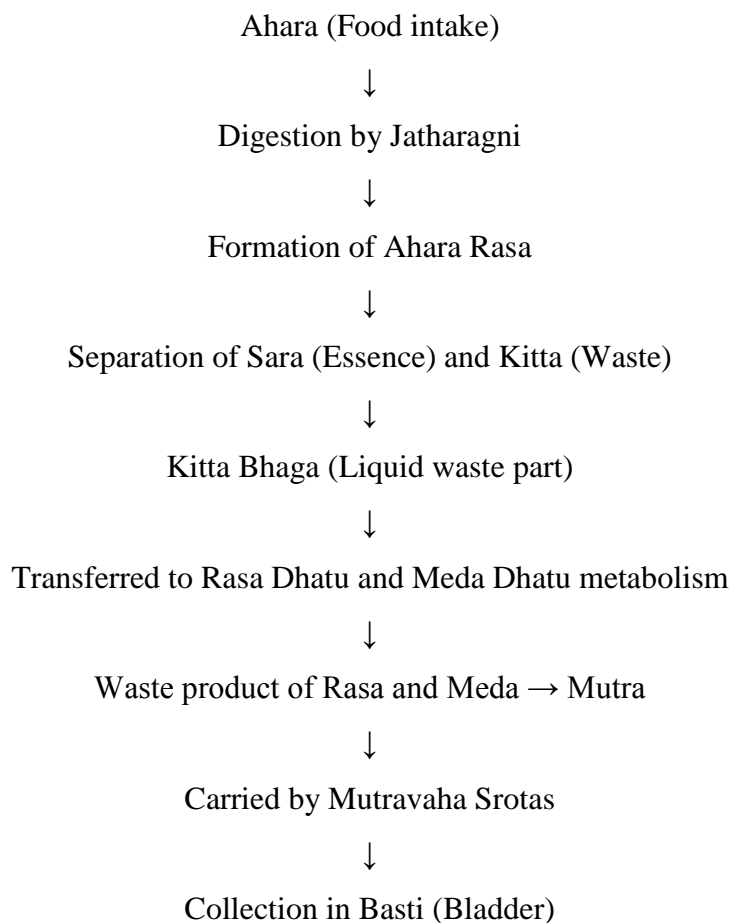
Clinical implications

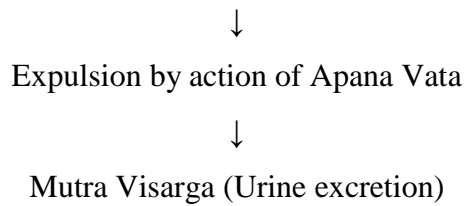
Disorders like *Prameha*, *Mutrakrichchhra*, *Mutraghata*, and *Ashmari* are direct outcomes of disturbances in *Mutrautpatti*.

- **Excessive mutra**: May indicate *Prameha* (Similar to diabetes mellitus)
- **Scanty mutra**: Indicates obstruction or vitiation of *Apana Vata*
- **Painful mutra**: Suggests *Vata* predominance or structural defects.^[16]



Flow chart of mutrautpatti (Urine formation in ayurveda)^[17]





Key findings

1. *Mutra* is formed as a waste product of *Rasa* and *Meda Dhatu* metabolism following the digestion of food.
2. The process of *Mutrautpatti* is governed by *Jatharagni*, *Dhatvagni* and *Apana Vata*, reflecting a systemic coordination rather than localized renal function.
3. *Mutravaha Srotas*, originating from *Basti* and *Medovaha Dhamanis*, functionally correlate with kidneys, ureters, and bladder in modern physiology.
4. *Apana Vata* plays a vital role in collection, retention, and timely expulsion of urine from the bladder.
5. The quality, color, and quantity of *Mutra* serve as diagnostic indicators in *Ayurveda*, aiding in the detection of doshic imbalances and urinary pathologies.

DISCUSSION

The classical concept of *Mutrautpatti* demonstrates how *Ayurveda* views physiological functions through a system-based and elemental approach. Unlike modern renal physiology, which focuses on nephrons and filtration rates, *Ayurveda* attributes urine formation to the metabolic aftermath of *Rasa* and *Meda Dhatus* following the digestion of food. The role of *Agni*—especially *Jatharagni* and *Dhatvagni*—is critical in processing *Ahara Rasa*, separating nutritive and waste components, and forming *Mutra* as a liquid byproduct.^[18]

A central player in this process is *Apana Vata*, one of the five subdivisions of *Vata Dosha*, which governs all downward-moving actions in the body. *Apana Vata* ensures the proper flow of *Mutra* from the site of origin through the *Mutravaha Srotas* and ultimately facilitates its expulsion through the *Basti*. Dysfunction of *Apana Vata* results in common urinary disorders such as *Mutrakrichchhra* (Dysuria), *Mutraghata* (Retention), and *Ashmari* (Urolithiasis), highlighting the regulatory and therapeutic importance of *Vata* in urogenital physiology.^[19]

The structural and functional role of *Mutravaha Srotas* offers an Ayurvedic counterpart to the renal tract. The *Mula* of these *Srotas*, as stated in *Charaka Samhita* and *Sushruta Samhita*,

includes *Vrikka*, *Medovaha Dhamanis*, and *Basti*. These correlate with the modern anatomical understanding of kidneys, ureters, and urinary bladder. This suggests that while anatomical terms may differ, both systems converge on the idea of filtration, transportation, storage, and excretion of liquid waste.^[20]

Another significant contribution of *Ayurveda* is its diagnostic approach via *Mutra Pariksha* (Urine examination), where features like color, clarity, odor, and frequency provide clues to doshic imbalances. These qualitative parameters align in principle with modern urinalysis, which also evaluates aspects like specific gravity, presence of ketones, and color changes to assess systemic conditions. Thus, traditional observational methods are complementary to modern biochemical investigations.^[21]

This comparative analysis reveals that although *Ayurveda* does not describe microscopic nephron-based mechanisms, its macroscopic and energetic understanding of urine formation offers a valuable integrative model. The holistic lens of *Ayurveda*, focusing on *Agni*, *Dosha*, *Dhatu*, and *Srotas*, allows for individualized management and early diagnosis of urinary disorders. Incorporating these insights into clinical practice could enhance preventive strategies and support the integration of traditional knowledge with contemporary medicine.^[22]

CONCLUSION

The concept of *Mutrautpatti* in *Ayurveda* provides a comprehensive and systemic understanding of urine formation as a metabolic byproduct of *Rasa* and *Meda Dhatu* metabolism, governed by *Agni*, *Apana Vata*, and *Mutravaha Srotas*. Unlike the organ-specific focus of modern physiology, *Ayurveda* emphasizes the energetic and functional dynamics that regulate the formation, transportation, storage, and expulsion of *Mutra*. The characteristics of urine serve as important diagnostic indicators for doshic imbalances and systemic health. This classical knowledge not only explains normal physiology but also aids in the early recognition and management of urinary disorders such as *Mutrakrichchhra*, *Mutraghata*, and *Prameha*. Integrating *Ayurvedic* principles with modern insights offers a holistic approach that supports personalized healthcare and strengthens preventive strategies in urinary system management.

Conflict of interest

Nil.

Source of support

None.

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