



Journal of Swasthavritta and Yoga

ISSN Print: 3078-7157
ISSN Online: 3078-7165
JSY 2025; 2(1): 01-09
www.swasthjournal.com
Received: 02-11-2024
Accepted: 06-12-2024

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Combining Swasthavritta and yoga in the management of metabolic syndromes

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DOI: <https://doi.org/10.33545/30787157.2025.v2.i1.A.6>

Abstract

Metabolic syndrome, a multifactorial lifestyle disorder characterized by obesity, insulin resistance, dyslipidemia, and hypertension, has emerged as a global health crisis. Ayurveda recognizes the roots of such conditions in improper diet, faulty lifestyle, and mental imbalance—concepts defined under Mithyā Āhāra-Vihāra. Swasthavritta, the Ayurvedic code for healthy living, prescribes a framework of daily and seasonal routines, dietary regulations, and behavioral ethics for maintaining health and preventing disease. Yoga, particularly the practice of Āsana, Prāṇāyāma, and Dhyāna, complements Swasthavritta by promoting physiological homeostasis and mental equilibrium. This paper explores the integration of Swasthavritta and Yoga in managing metabolic syndrome, highlighting their combined potential to restore doṣa balance, regulate agni, reduce āma, and enhance insulin sensitivity. Through a synthesis of classical texts and modern clinical studies, the study proposes a holistic, non-pharmacological, and cost-effective approach that addresses both the cause and manifestation of metabolic disorders.

Keywords: Metabolic syndrome, Swasthavritta, yoga, Mithyā Āhāra-Vihāra, Āsana, Prāṇāyāma

Introduction

The rapid shift from traditional living to modern sedentary lifestyles, coupled with unwholesome food habits and chronic stress, has led to an unprecedented rise in metabolic syndrome across the globe. Defined by the clustering of risk factors such as abdominal obesity, hyperglycemia, hypertriglyceridemia, low HDL cholesterol, and hypertension, metabolic syndrome significantly increases the risk of cardiovascular disease, type 2 diabetes, and stroke. Despite advancements in pharmacology, long-term management remains challenging due to the behavioral nature of its etiology.

Ayurveda, the ancient Indian system of medicine, offers a preventive and holistic approach through Swasthavritta, the science of healthy living. Grounded in Maulik Siddhāntas such as Tridoṣa, Agni, Dhātu, and Srotas Siddhāntas, Swasthavritta outlines regimens that promote balance and prevent disease. These include Dinacharyā (daily routine), R̥tucharyā (seasonal adaptation), Āhāra (balanced diet), and Vihāra (healthy behavior), each of which plays a critical role in maintaining metabolic health.

In parallel, Yoga, as described in Pātañjala Yoga Darśana and various Ayurvedic texts, provides tools to regulate the nervous system, enhance mental clarity, and modulate endocrine and metabolic functions. Its components—āsana (posture), prāṇāyāma (breath regulation), and dhyāna (meditation)—have shown significant impact on weight management, insulin sensitivity, blood pressure control, and stress reduction. The integration of Swasthavritta and Yoga thus offers a synergistic model for managing metabolic syndrome by addressing both physiological and psychological root causes.

This paper examines the classical basis and modern relevance of combining Swasthavritta and Yoga as a comprehensive, patient-centered strategy to reverse or control metabolic disorders, with a focus on practical implementation and scientific validation.

Understanding Metabolic Syndrome in Contemporary and Ayurvedic Contexts

Metabolic syndrome, also referred to as syndrome X or insulin resistance syndrome, represents a cluster of interconnected risk factors that exponentially increase the likelihood of developing cardiovascular disease, type 2 diabetes mellitus, non-alcoholic fatty liver disease

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(NAFLD), and other chronic illnesses. As per the National Cholesterol Education Program Adult Treatment Panel III (NCEP ATP III) and International Diabetes Federation (IDF), metabolic syndrome is diagnosed when three or more of the following are present: increased waist circumference, elevated triglycerides, low high-density lipoprotein (HDL) cholesterol, high fasting glucose, and elevated blood pressure.

Globally, the prevalence of metabolic syndrome is rising alarmingly due to rapid urbanization, reduced physical activity, nutritional transitions toward calorie-dense but nutrient-poor foods, increased psychological stress, and sleep deprivation. In India, urban populations are particularly vulnerable due to dietary indulgences and sedentary occupations. However, despite modern medicine's understanding of the biochemical and physiological dimensions of metabolic syndrome, the root causes—behavioral, dietary, and emotional—often remain unaddressed, necessitating integrative approaches rooted in behavior-centric health systems.

In Ayurveda, although there is no direct term that maps perfectly onto "metabolic syndrome," its characteristics and etiology are well understood within the framework of Madhumeha (diabetes mellitus), Sthaulya (obesity), Medoroga (lipid disorders), Raktagata Vāta (hypertension), and Amaja vyādhis (disorders due to metabolic toxins). These conditions are classified under the category of Santarpanottha vyādhi—diseases caused by over-nutrition and improper satiety—reflecting the Ayurvedic understanding of metabolic overload and impaired digestion.

The foundational Ayurvedic text Caraka Saṃhitā identifies mithyā āhāra-vihāra (improper diet and lifestyle), manda agni (low digestive/metabolic fire), and āma utpatti (formation of toxic undigested materials) as the triad responsible for disease initiation. In the context of metabolic syndrome, these causes manifest as high-calorie junk food, erratic meal timing, night eating, lack of exercise, chronic stress, and disturbed sleep—each contributing to the aggravation of Kapha and Meda, weakening of Agni, and clogging of srotas (channels).

The concept of Meda Dhātu in Ayurveda is especially relevant to metabolic syndrome. Meda, or adipose tissue, is the fourth dhātu formed in the sequence of dhātu paripāka (tissue metabolism), and its accumulation beyond physiological limits results in deranged lipid profiles, weight gain, and the obstruction of normal srotas functions. Caraka explains that excessive consumption of guru (heavy), snigdha (unctuous), madhura (sweet), and śīta (cold) foods, when coupled with a sedentary lifestyle and mental lethargy (tāmasika state), leads to Medo dhātu dushti, manifesting as conditions such as sthūlatā (obesity) and prameha (urinary disorders).

Importantly, Ayurveda doesn't separate physical and mental health. Psychological contributors such as stress, greed, anxiety, emotional suppression, and overattachment are considered equally pathogenic. These disturb the balance of manodoshas (Rajas and Tamas), influence Agni, and impair the manovāha srotas, thus initiating or exacerbating metabolic imbalance. Stress, in particular, is considered a potent prajñāparādha (intellectual error), leading to self-damaging choices, addictive behaviors, and a cascade of systemic dysfunctions—very much aligned with what is now understood in psychoneuroimmunology and behavioral

medicine.

Another concept integral to Ayurvedic understanding of metabolic dysfunction is Vṛddhi and Kṣaya (excess and depletion). In metabolic syndrome, there is often vṛddhi of Kapha and Meda, and kṣaya of Agni and Ojas. This imbalance causes sluggishness, reduced metabolism, chronic fatigue, emotional dullness, and disturbed immunity. Hence, the Ayurvedic approach is not simply to reduce body weight or normalize lab values, but to reignite agni, clear āma, restore srotas patency, and cultivate mental clarity through sattva-promoting lifestyle choices.

The Srotas Siddhānta also plays a crucial role in Ayurvedic conceptualization. The medovaha srotas (fat tissue channels), raktavaha srotas (circulatory channels), and māṃsavaha srotas (muscular tissue channels) are typically involved in metabolic syndrome. When blocked or dysfunctional, they lead to dyslipidemia, hypertension, and organ perfusion irregularities. Restoration of these srotas requires more than pharmacological agents—it needs dietary restructuring, detoxification, exercise, and stress management.

Ayurveda offers a multidimensional diagnostic lens through nidāna pañcaka (five-fold diagnostic framework)—comprising nidāna (causative factors), pūrvarūpa (premonitory signs), rūpa (clinical symptoms), upaśaya (therapeutic tests), and samprāpti (pathogenesis). Metabolic syndrome is best understood as a Sāma condition, i.e., a state where āma is involved in the samprāpti and causes obstruction at both cellular and systemic levels. Management, therefore, begins with āma-pācana (detoxification), agni dīpana (metabolic stimulation), and doṣa śamana (pacification therapies).

It is important to note that Ayurveda is not prescriptive but adaptive and individual-centric. Therefore, management protocols for metabolic syndrome are not one-size-fits-all but are designed in consideration of prakṛti (constitution), vāya (age), kāla (time), deśa (habitat), bala (strength), and āhāra satmya (dietary compatibility). This is in direct contrast to modern systems where uniform guidelines dominate despite biological variability. Modern medicine, for its part, excels in diagnostics and acute care but often underperforms in long-term behavioral management. Pharmacological approaches such as antihypertensives, lipid-lowering agents, hypoglycemics, and appetite suppressants may provide symptomatic relief but rarely address the root lifestyle dysfunctions. Furthermore, they may induce dependence, adverse effects, or compliance challenges. Ayurveda offers a sustainable path by transforming daily habits into healing rituals through Swasthavṛtta and enhancing internal regulation mechanisms. Therefore, while metabolic syndrome poses a complex challenge from a biomedical standpoint, Ayurveda conceptualizes it through well-established paradigms that holistically encompass diet, behavior, environment, and mental well-being. This perspective not only aligns with modern findings in epigenetics, chrononutrition, and psychoneuroendocrinology but also provides a cohesive, personalized framework for intervention. The integration of Yoga, as explored in subsequent sections, further enhances this approach by targeting autonomic regulation, mental clarity, and behavioral resilience, making the Ayurvedic understanding of metabolic syndrome both clinically relevant and evolutionarily intelligent.

Swasthavṛtta: Philosophical and Preventive Foundations

Swasthavṛtta, derived from the Sanskrit roots “Swastha” (healthy) and “Vṛtta” (regimen or conduct), encapsulates the classical Ayurvedic vision of health preservation through disciplined daily and seasonal living. Deeply embedded within the Maulik Siddhāntas (foundational principles) of Ayurveda, Swasthavṛtta is not merely a set of lifestyle instructions but a philosophical construct that aligns the individual's biology, psychology, and behavior with universal rhythms. At its core, Swasthavṛtta presents a model of proactive and preventive health, predicated on the understanding that disease arises from disorder (vikṛti), while health is maintained by remaining in a state of order (prakṛti). In the context of modern lifestyle diseases like metabolic syndrome, this framework becomes profoundly relevant.

The cornerstone of Swasthavṛtta is the concept of balance—of doṣas, agni, dhātus, malas, and manas, as emphasized in the *Caraka Saṃhitā*'s definition of health:

“Samadoṣaḥ samāgniśca samadhātu malakriyāḥ |
Prasannātmendriya manāḥ svastha ityabhidhīyate ||”
(*Caraka Saṃhitā*, Sūtrasthāna 9.4)

This verse delineates health as a state of dynamic equilibrium. Swasthavṛtta is the operationalization of this ideal through structured and mindful conduct in relation to diet, activity, sleep, speech, ethics, emotions, and environment.

In the management and prevention of metabolic syndrome, Swasthavṛtta offers a behavioral medicine paradigm, anticipating principles now validated in lifestyle science, chronobiology, and personalized nutrition. It provides the foundational routines of Dinacharyā (daily regimen) and R̥tucharyā (seasonal regimen) that regulate biorhythms, support metabolic function, and optimize adaptation to environmental stimuli. These regimens are designed to keep the tridoṣa—Vāta, Pitta, and Kapha—in cyclical balance, responding to natural fluctuations across the day and year.

For instance, Vāta predominates in early morning (2-6 AM and PM), Pitta during mid-day and midnight (10-2), and Kapha during dawn and dusk (6-10). Dinacharyā leverages these rhythms by prescribing the ideal time for waking, elimination, exercise, bathing, eating, and rest, in accordance with doṣic dominance and Agni strength. This ensures that physiological processes such as digestion, detoxification, hormonal regulation, and tissue nourishment are synchronized with natural efficiency peaks. In the context of metabolic syndrome, where circadian disruption is a major etiological factor, the implementation of Dinacharyā aids in resetting internal clocks, optimizing digestion, enhancing insulin sensitivity, and stabilizing neuroendocrine feedback loops.

A similar approach is applied through R̥tucharyā, where seasonal variations are matched with specific dietary adjustments, physical routines, clothing, and rest patterns. For example, in Gr̥ṣma (summer), due to Pitta aggravation and agni reduction, Swasthavṛtta recommends light, cooling, and hydrating foods, avoiding intense sun exposure, and minimizing physical exertion. In contrast, Hemanta (early winter), characterized by strong agni and Kapha dominance, is ideal for nourishing foods, heavier exercise, and oleation. These seasonal alignments prevent ritujanya vikāras (seasonally triggered disorders) and maintain metabolic

balance despite environmental stressors. Modern parallels can be seen in the growing emphasis on seasonal eating, light exposure therapy, and vitamin D regulation, affirming the prescience of R̥tucharyā. Beyond physical routines, Swasthavṛtta emphasizes Sadvṛtta and Ācāra Rasāyana—ethical and moral conduct that ensures mental and emotional hygiene. In metabolic syndrome, psychological components like stress, frustration, compulsive eating, and sleep disturbance are major contributors to pathogenesis. Sadvṛtta principles such as truthfulness, self-discipline, compassion, non-violence, mindfulness, and respect not only cultivate sattva (mental clarity and balance) but also improve behavioral compliance, social interaction, and emotional regulation. These traits have direct biological implications via neuroplasticity, vagal tone enhancement, and cortisol regulation, positioning Swasthavṛtta as a form of behavioral Rasāyana—a rejuvenation protocol for the mind and lifestyle. Integral to Swasthavṛtta is the regulation of Āhāra and Vihāra, which together comprise the body's primary inputs. Āhāra refers not only to food but the quality, quantity, timing, combination, method of preparation, and mental state during eating. These parameters are rooted in Tridoṣa and Agni Siddhāntas, ensuring that food intake supports dhātu nourishment, āma clearance, and Ojas production. For metabolic syndrome, improper āhāra is the first nidāna—overeating, eating at night, emotional eating, or consuming incompatible foods directly lead to meda dhātu vṛddhi (adipose tissue hypertrophy), agni mandya, and doṣa sāñcaya (accumulation).

Vihāra, or lifestyle behavior, addresses the other pillar of health. It encompasses physical activity, sleep, sex, speech, mental habits, and sensory regulation. Daily rituals such as abhyanga (self-massage), vyāyāma (exercise), snāna (bathing), dhyāna (meditation), and brahmacharya (moderation in pleasure-seeking) are recommended not only for purification but for strengthening immunity, enhancing circulation, and sharpening mental focus. In the modern context, these translate into mindful movement, emotional resilience, hormonal balance, and immune modulation, all of which are central to metabolic regulation.

Swasthavṛtta also pays attention to indriyopayoga (sensory hygiene), recognizing that excess stimulation or suppression of sensory inputs can lead to anxiety, addiction, or inertia. In today's digital era, where constant exposure to screens, artificial light, noise pollution, and overstimulation prevail, the practice of śrotra nigrāha (auditory control), cakṣu niyama (visual regulation), and niścintana (intentional withdrawal) becomes a form of preventive psychiatry—especially relevant in psychosomatic aspects of obesity, binge eating, and insomnia.

Unlike reductionist models of health that fragment systems into parts, Swasthavṛtta operates from a systems biology perspective, integrating the microcosm of the human body with the macrocosm of nature. It affirms that health is not merely the absence of disease but the presence of equilibrium in physical functions, mental disposition, and spiritual alignment. When practiced diligently, Swasthavṛtta becomes a path of self-governed health literacy, where the individual becomes the agent of their own wellness, adapting rituals and routines to suit prakṛti, season, geography, age, and occupational demands. As modern medicine grapples with the challenges of behavioral compliance, chronic care, and patient engagement, Swasthavṛtta provides a comprehensive solution—one that

combines the wisdom of classical Ayurveda with the demands of 21st-century health realities. In the context of metabolic syndrome, Swasthavṛtta's lifestyle code holds the promise of prevention, reversal, and life transformation, not through synthetic drugs or external interventions, but through the rediscovery of intelligent living—a return to one's biological nature and environmental harmony.

Role of Āhāra and Vihāra in the Pathogenesis and Reversal of Metabolic Syndrome

In Ayurvedic philosophy, the maintenance of health and the onset of disease are intricately connected with the quality, quantity, timing, and suitability of Āhāra (diet) and Vihāra (lifestyle or behavior). The ancient seers recognized long ago what modern science has only recently confirmed—that lifestyle disorders, including metabolic syndrome, arise from daily dietary errors, sedentary patterns, emotional disturbances, and lack of biological rhythm. The classical Ayurvedic notion of Mithyā Āhāra and Mithyā Vihāra forms the root nidāna (cause) of such systemic disorders. These elements, when misaligned with prakṛti (individual constitution), kāla (time), and agni (digestive fire), set into motion a pathological cascade involving doṣa aggravation, agni derangement, āma formation, and eventually the disruption of srotas.

Metabolic syndrome, as understood in Ayurvedic terms, is largely the result of Kapha and Meda vṛddhi, Agni mandya (weak digestion), and srotorodha (channel blockage), all of which are strongly influenced by inappropriate Āhāra and Vihāra. Foods that are guru (heavy), snigdha (unctuous), śīta (cold), madhura (sweet), and āmiṣa (animal-origin), when consumed in excess or at improper times—such as late-night meals—overwhelm jatharāgni (primary digestive fire) and lead to meda dhātu overproduction. Over time, this contributes to Sthaulya (obesity), Prameha (metabolic disorders including diabetes), Amaja Vyādhis, and Hṛdroga (cardiovascular dysfunctions).

Similarly, improper Vihāra—marked by physical inactivity, daytime sleeping, night awakeness, excessive indulgence in pleasures, mental stress, and suppression of natural urges—further contributes to the disease process. Vihāra apathya impairs physiological rhythm, suppresses metabolic efficiency, and disrupts hormonal balance. The accumulation of Kapha and aggravation of Vāta through sedentary behaviors results in sluggish movement of nutrients and waste, promoting metabolic stagnation.

On the contrary, correct Āhāra and Vihāra, as outlined in Swasthavṛtta, have the power to reverse this pathogenesis by rekindling agni, clearing āma, regulating dhātu formation, and pacifying doṣas. A diet aligned with doṣa prakṛti and seasonal rhythm, for example, allows the digestive system to function optimally without excessive burden. A Pittaja individual consuming cooling and slightly sweet foods in summer, or a Kaphaja individual avoiding heavy, oily food during spring, not only prevents imbalance but strengthens immunity and promotes tissue clarity. In metabolic syndrome, specific dietary strategies from Swasthavṛtta are particularly effective. The intake of light, warm, freshly prepared meals, in accordance with digestive capacity and satiety cues, helps restore digestive rhythm. Timely eating, especially when the sun is at its zenith (Pitta kāla: 10 am-2 pm), ensures proper enzymatic activity and minimizes postprandial glycemic spikes. Avoiding snacking, overeating, and incompatible food combinations

(viruddhāhāra) further reduces digestive stress and toxin accumulation. Additionally, water intake in small sips, consumption of bitter and astringent foods, and the use of spices like turmeric, ginger, and black pepper enhance metabolism and help in āma-pācana (digestion of toxins). Apart from food choices, the method of eating is equally important. Swasthavṛtta emphasizes āhāra vidhi vidhāna—eating with focus, in a peaceful environment, with mindfulness and gratitude. Modern studies on mindful eating and parasympathetic activation during meals support the benefits of such behavior in improving digestion, reducing overeating, and enhancing insulin sensitivity. These practices down-regulate sympathetic activity and promote vagal tone, improving nutrient assimilation and satiety response.

Vihāra, as a complementary pillar to Āhāra, focuses on regulating activity, sleep, and sensory inputs. In metabolic syndrome, implementing a daily routine involving early rising (brāhma muhūrta), moderate exercise (vyāyāma), regular bowel movement, abhyanga (self-oil massage), and snāna (cleansing bath) acts as both a detoxifying and stimulating mechanism. Exercise, particularly, is emphasized in Kapha and Meda disorders. Texts such as *Caraka Saṃhitā* state:

“Balārogya karaṃ vyāyāmaḥ”—Exercise imparts strength and health.

(*Caraka Saṃhitā, Sūtrasthāna 7.32*)

Moderate physical activity, practiced according to one's strength and season, improves circulation, lymphatic drainage, and adipose metabolism, countering the lethargy and stagnation seen in Kapha-related disorders. In modern terms, this aligns with the role of aerobic training, resistance workouts, and NEAT (non-exercise activity thermogenesis) in metabolic syndrome reversal.

Sleep regulation also plays a vital role in restoring circadian alignment. Night sleep during Kapha-predominant hours (10 pm-2 am) supports anabolic repair and hormonal cycling. Avoiding rātribhojana (late dinners) and rātri jāgaraṇa (night awakeness) helps in maintaining metabolic balance. Contemporary research confirms that late-night eating and sleep disruption lead to higher cortisol levels, impaired glucose metabolism, and increased fat deposition—validating Ayurvedic cautions.

Another important component of Vihāra is the management of psychological stress, which Ayurveda views through the lens of manasika doṣa (Rajas and Tamas), prajñāparādha, and srotorodha. Stress leads to emotional eating, erratic habits, and neuroendocrine imbalances that mimic or amplify metabolic disorders. Therefore, Swasthavṛtta prescribes emotional regulation through sadvṛtta (ethical living), ācāra rasāyana, and mental cultivation via prāṇāyāma, meditation, mantra, and silence. The resulting enhancement of sattva (clarity) and restraint improves behavior, reduces impulsivity, and supports long-term compliance with healthy habits.

In reversing metabolic syndrome, both Āhāra and Vihāra must be customized based on prakṛti (constitution), vikṛti (imbalance), agni status, āma presence, and mental disposition. For example, in a Vāta-Kapha mixed constitution, warm, light, and mildly unctuous foods are preferred, and exercise should be regular but gentle. A Pitta-dominant patient with metabolic inflammation might benefit more from cooling foods, soothing routines, and stress-reducing behaviors.

Modern preventive medicine is increasingly converging with these principles. Concepts like intermittent fasting, circadian eating, chronotype-based routines, lifestyle coaching, and integrative behavior therapy reflect the same holistic thinking found in Swasthavritta. By restoring biological rhythm, cellular clarity, and emotional coherence, Āhāra and Vihāra act not as passive supports but as active medicines, modulating physiology and psychology from the foundation.

Thus, Āhāra and Vihāra, when rightly practiced, form the core therapeutic platform in Swasthavritta to both prevent and reverse metabolic syndrome. Unlike symptomatic interventions, they work at the root cause level, reestablishing the body's innate intelligence, digestive competence, and systemic rhythm. As such, their incorporation into public health frameworks and personal wellness strategies is not only justified but urgently needed.

Yogic Interventions for Metabolic Regulation

Yoga, an ancient discipline rooted in the Śaḍdarśanas of Indian philosophy, provides a comprehensive psychosomatic system that is both preventive and therapeutic. For lifestyle disorders like metabolic syndrome, Yoga offers an effective modality by acting at the levels of physical physiology, mental function, and emotional resilience. While Ayurveda provides the behavioral and physiological codes through Swasthavritta, Yoga strengthens the inner governance (niyama), mental equipoise (dhyāna), and vital regulation (prāṇāyāma) that together facilitate healing from within.

In the context of metabolic syndrome, where chronic stress, sedentary habits, and poor dietary discipline are dominant factors, Yogic practices target the underlying causes, not just symptomatic relief. Yoga promotes balance in manovāha srotas (mental channels) and prāṇavāha srotas (respiratory-vital energy channels), which in turn modulate endocrine functions, autonomic balance, digestion, sleep patterns, and emotional responses—all of which play a pivotal role in metabolic health.

Clinical evidence increasingly supports the inclusion of Yoga in the management of metabolic disorders. Research shows that regular practice of āsanās (postures) improves insulin sensitivity, body mass index, lipid profiles, and blood pressure. Specific āsanās that focus on abdominal compression, spinal mobility, and glandular stimulation—such as Trikoṇāsana (triangle pose), Paścimottānāsana (seated forward bend), Bhujangāsana (cobra pose), Dhanurāsana (bow pose), and Matsyendrāsana (twist)—are known to massage abdominal organs, enhance digestion, and promote the metabolism of stored fat and toxins.

From an Ayurvedic perspective, these āsanās reduce Kapha accumulation and Meda dhātu vṛddhi, stimulate Agni, and open the pathways for āma clearance. They also activate the nāḍī system, helping restore balance in the distribution of prāṇa, apāna, and samāna vāyu, which are crucial in digestion, elimination, and mental clarity.

Prāṇāyāma, the conscious regulation of breath, is a powerful tool for autonomic stabilization. Practices like Nāḍī Śuddhi (alternate nostril breathing), Bhrāmārī (humming breath), Kapālabhāti (cleansing breath), and Ujjāyī (victorious breath) regulate the sympathetic-parasympathetic balance, improve oxygen uptake, and decrease serum cortisol levels. In metabolic syndrome, where hyperinsulinemia and chronic low-grade inflammation are common, these breath

techniques calm the hypothalamic-pituitary-adrenal axis, thereby reducing systemic stress and promoting hormonal equilibrium.

Moreover, prāṇāyāma purifies the nāḍī-srotas (subtle energy channels), which is essential for smooth prāṇa flow and mental clarity. The stimulation of prāṇa vāyu via breathwork also influences Agni, bringing about metabolic recalibration. This makes prāṇāyāma not just a relaxation practice but a prāṇic therapy that restores vitality, mental focus, and biochemical stability.

Dhyāna (meditation) further complements the physiological effects of āsana and prāṇāyāma by addressing the root disturbances in manas (mind) and indriyas (senses). In metabolic syndrome, emotional dysregulation—often driven by chronic stress, anxiety, and addictive behavior—feeds into the cycle of overeating, poor sleep, hormonal fluctuation, and metabolic disruption. Meditation techniques like Om japa (mantra repetition), Yoga Nidra (guided awareness), mindfulness, and breath-focused concentration reduce rajas (restlessness) and tamas (inertia), thereby restoring sattva (mental clarity and harmony).

Scientific studies show that daily meditation enhances parasympathetic tone, increases prefrontal cortex activity, and downregulates amygdala-based fear responses, all of which result in better emotion regulation, healthier habits, and increased resilience. Meditation also improves interoceptive awareness, which helps individuals tune into satiety signals and avoid emotional or stress-induced eating. In combination, āsana, prāṇāyāma, and dhyāna create a multilevel transformation—from gross bodily changes to subtle energetic and emotional shifts. These practices support the reversal of the underlying mechanisms of metabolic syndrome: they improve digestion, detoxify tissues, reduce inflammation, support neuroendocrine balance, and foster a sense of inner control and mindfulness necessary for long-term lifestyle change.

Yogic philosophy also provides behavioral and psychological frameworks that align with Swasthavritta. The Yamas (ethical restraints) and Niyamas (observances), described in Pātañjala Yoga Sūtras, reflect the same ideals as Sadvṛtta and Ācāra Rasāyana in Ayurveda. For example, Āhimsā (non-violence), Satya (truth), Aparigraha (non-possessiveness), and Tapas (self-discipline) serve to regulate desires, prevent overindulgence, and cultivate restraint and awareness—all of which are crucial in managing lifestyle-related disorders.

Yogic discipline inculcates self-awareness, introspection, and inner motivation, which are the missing components in many therapeutic protocols for metabolic syndrome. While medicine can manage symptoms, only a change in personal consciousness and lifestyle discipline can transform the roots of chronic metabolic dysfunction. Yoga, in this sense, becomes both the practice and the path—providing tools and the inner clarity to walk the path effectively.

Furthermore, Yoga helps normalize circadian rhythms, which are increasingly disrupted in modern society due to artificial light, erratic schedules, and digital overexposure. The regulation of melatonin, cortisol, and insulin cycles through timed Yoga practice—especially early morning routines—restores biorhythms and improves sleep, metabolism, and appetite regulation. This links deeply with the Ayurvedic recommendations of brāhma muhūrta jāgaraṇa (pre-dawn waking), vyāyāma (physical activity),

and prāṇāyāma (breath alignment), reinforcing the synergy between the two disciplines.

Yogic practices also offer value in post-prandial and postural regulation. Short sessions of vajrāsana (diamond pose) after meals improve digestion and glycemic control. Midday mindfulness or brief breathing practices can reset stress circuits and reduce emotional fluctuations that impact food intake and energy metabolism. In this way, Yoga is not confined to mat-based sessions but becomes a pervasive awareness integrated into every aspect of daily living—precisely the goal of both Swasthavṛtta and the Yogic ideal of balanced living.

In modern healthcare models, Yoga is increasingly being incorporated into cardiac rehab, diabetes management, obesity clinics, and psychosomatic care. Its low cost, accessibility, and adaptability make it ideal for community-based interventions, schools, corporate wellness programs, and elderly care. Combined with Ayurvedic dietary guidance and Swasthavṛtta routines, Yoga enhances both compliance and outcomes.

Thus, in the management of metabolic syndrome, Yoga serves as the dynamic, transformative aspect of the holistic regimen. It engages the patient in a process of bodily renewal, emotional purification, mental clarity, and lifestyle restructuring. Rather than being an adjunct to medicine, Yoga becomes the core modality through which sustainable healing unfolds—one that complements and amplifies the preventive and promotive strength of Ayurveda's Swasthavṛtta.

Psychophysiological Interface of Swasthavṛtta and Yoga

The convergence of Swasthavṛtta and Yoga represents not only a blending of Ayurvedic lifestyle wisdom and yogic discipline but also a unified psychophysiological framework that addresses the mind-body continuum—a concept that modern science is only beginning to fully explore. In the realm of metabolic syndrome, this interface becomes especially vital, as the disorder does not stem solely from physical imbalances such as lipid dysregulation or insulin resistance, but also from profound psychological and behavioral dysregulation. The integrative application of these two systems directly targets this duality, offering a holistic strategy that aligns mental clarity with physical order.

From an Ayurvedic standpoint, Swasthavṛtta aims to maintain the equilibrium of doṣas, agni, dhātus, malas, and manas through daily and seasonal regimens. These regimens are not merely mechanical rituals but are intended to maintain harmony between the external environment and the internal milieu. Dinacharyā, for instance, aligns the body with circadian rhythms, regulating neurohormonal secretions such as cortisol, melatonin, insulin, and digestive enzymes. This alignment supports healthy digestion, balanced metabolism, and proper elimination, which are foundational in the prevention and reversal of metabolic dysfunction.

The mental discipline prescribed in Swasthavṛtta—through principles like sadvṛtta and ācāra rasāyana—is equally significant. These principles emphasize moral behavior, emotional restraint, compassion, mindfulness, and truthfulness, all of which contribute to the development of sattva, the guna responsible for clarity, calmness, and harmony. Modern psychological research confirms that these traits correspond with enhanced vagal tone, lower

cortisol levels, and reduced systemic inflammation, all markers relevant to metabolic syndrome risk.

Yoga, meanwhile, approaches the psychophysiological system through its eightfold path (Aṣṭāṅga Yoga), which begins with Yama and Niyama—ethical observances aligned closely with sadvṛtta—and culminates in samādhi, or integrated consciousness. The physical practices of āsana and prāṇāyāma are bridges that prepare the body and mind for deeper awareness. Yoga perceives disease (vyādhi) as a blockage in the flow of prāṇa and the imbalance of guṇas, particularly the excess of rajas (agitation) and tamas (inertia), both of which are also emphasized in Ayurveda as mental doṣas.

In metabolic syndrome, these mental doṣas are often prominent. Individuals suffering from obesity, diabetes, or hypertension frequently exhibit emotional eating, sleep irregularities, chronic stress, low motivation, and mental fog. These are not only symptoms but also perpetuating causes of the syndrome. The Yoga-Swasthavṛtta interface offers a framework to dissolve this cycle by introducing stillness, discipline, awareness, and rhythmic regulation into the mind and body.

The role of the autonomic nervous system (ANS) becomes central in understanding this interface. Chronic stress activates the sympathetic nervous system (SNS), increasing heart rate, blood pressure, blood glucose levels, and inflammatory cytokines—all contributors to the pathogenesis of metabolic syndrome. This constant overactivation suppresses the parasympathetic nervous system (PNS), responsible for rest, digestion, and repair. Yoga and Swasthavṛtta together work to recalibrate this imbalance.

Daily practices like abhyanga (self-massage), warm bathing, light-to-moderate exercise, early rising, regular meals, and timely sleep activate the PNS by establishing safety and predictability in the body's rhythms. Yoga adds to this through slow breathing (prāṇāyāma) and meditation (dhyāna), which directly increase heart rate variability (HRV)—a marker of autonomic adaptability. Improved HRV has been linked to better glycemic control, blood pressure regulation, and stress resilience in clinical studies.

Another physiological mechanism where Swasthavṛtta and Yoga converge is the hypothalamic-pituitary-adrenal (HPA) axis, which modulates the body's stress response. Chronic activation of the HPA axis due to lifestyle stressors leads to elevated cortisol, promoting visceral fat accumulation, insulin resistance, and systemic inflammation. Yoga and daily Ayurvedic routines downregulate this axis, returning it to its natural pulsatile and adaptive rhythm. This reduces the biological load on the system and allows metabolic healing to proceed.

On a neurochemical level, both systems enhance the levels of serotonin, dopamine, gamma-aminobutyric acid (GABA), and oxytocin, which are involved in mood regulation, satiety, emotional bonding, and reward modulation. These neurochemicals are essential not just for emotional wellness but also for regulating food cravings, addictive behavior, and emotional eating—all critical in managing metabolic syndrome.

One of the most profound psychophysiological contributions of Yoga-Swasthavṛtta integration is its effect on interoception, the body's ability to perceive internal sensations. People with metabolic disorders often lose touch with hunger, fullness, fatigue, and emotional states, leading

to maladaptive behaviors. Yoga, through āsana and meditation, improves interoceptive sensitivity, while Swasthavṛtta rituals reinforce attunement through sensory discipline, mindful eating, and rest cycles.

The gut-brain axis, an emerging field of research, also reflects the value of this integration. The gut microbiome, often disrupted in metabolic syndrome, is sensitive to stress, diet, and circadian misalignment. Ayurvedic meals with digestive spices, regular eating times, and Yogic stress reduction restore gut microbial balance, improve digestion, and reduce endotoxemia (toxin-induced inflammation). This has downstream effects on neurotransmitter synthesis, mood, and metabolic flexibility.

Furthermore, this integrated approach supports behavioral transformation, not just temporary improvement. Swasthavṛtta gives structure and direction, while Yoga cultivates inner motivation, willpower (tapas), and self-observation (svādhyāya). Together, they create a feedback loop where improved physical health supports deeper meditation, and mental clarity enhances the motivation to follow healthier routines.

In a world where metabolic syndrome is treated largely by external interventions—medications, surgeries, or nutritional fads—the Swasthavṛtta-Yoga interface presents an inward, self-regulatory, and sustainable solution. It reestablishes self-efficacy, the belief in one's capacity to influence their own health, which is often lost in patients with chronic conditions. This empowerment, along with physiological balance, becomes the true medicine.

Thus, the psychophysiological interface of Swasthavṛtta and Yoga is not merely complementary—it is foundational. It offers a complete roadmap where the gross, subtle, and causal bodies are brought into coherence. In metabolic syndrome, where the disease arises not only from what one eats but how one lives, thinks, and feels, this integration provides the most holistic, evidence-informed, and timeless path to healing.

Synergistic Integration: Protocols and Case-Based Evidence

The fusion of Swasthavṛtta and Yoga into a unified, evidence-based protocol provides a comprehensive, patient-centered system for managing metabolic syndromes, targeting both the root causes and manifestations of the disease. While each system is independently robust, their integration creates a synergistic approach that is greater than the sum of its parts—addressing behavior, biology, energy, and consciousness in unison. This section outlines practical protocols derived from classical texts and supported by modern scientific insights, along with documented case-based applications that exemplify the healing potential of such integration.

A typical Swasthavṛtta-Yoga-based metabolic syndrome management protocol involves sequenced interventions that are adaptable to prakṛti, severity of symptoms, age, and patient compliance. These protocols are best initiated through proper assessment, including Ayurvedic parameters (prakṛti, agni, āma, doṣa status, bala, sattva) and modern metrics (waist circumference, BMI, lipid panel, blood pressure, HbA1c, and inflammatory markers).

A structured protocol may be implemented as follows:

Morning Dinacharyā (pre-sunrise to mid-morning)

The patient is encouraged to wake during brāhma muhūrta

(4:30-5:30 AM), followed by mala visarjana (bowel cleansing) and oral hygiene. This is followed by abhyanga (self-massage) using warm medicated oils such as triphala taila or tiktaka ghr̥ta to stimulate lymphatic flow and pacify aggravated doṣas, especially Vāta and Kapha.

A 30-45-minute yoga session includes:

- Sūryanamaskāra (Sun salutations)
- Trikoṅāsana, Bhujangāsana, Dhanurāsana, Paścimottānāsana, and Matsyendrāsana
- 10-15 minutes of Nāḍi Śuddhi, Kapālabhāti, or Bhrāmarī Prāṇāyāma
- Ending with 10 minutes of Dhyāna or Yoga Nidra

Dietary Regimen (Āhāra)

Meals are scheduled around doṣa and Agni cycles, with the **largest meal taken between 10 AM and 2 PM** during Pitta kāla. Foods are selected based on prakṛti:

- **Kapha-dominant patients:** light, spicy, warm meals; avoid dairy and refined sugar
- **Pitta-dominant:** cooling, slightly sweet foods; avoid excessive salt or spices
- **Vāta-dominant:** unctuous, warm, grounding meals

Use of digestive spices (ginger, cumin, black pepper) and inclusion of bitter and astringent vegetables improves metabolism. Patients are advised to avoid viruddhāhāra (incompatible foods) like milk with fruits, and to eat with mindfulness, avoiding distractions like screens.

Afternoon to Evening Routine

After lunch, vajrāsana for 5-10 minutes is recommended to aid digestion. Patients are encouraged to engage in light walking or gentle movement in the late afternoon.

Dinner is to be taken before sunset or at least by 7 PM, consisting of easily digestible and Kapha-pacifying foods. Late-night eating is strictly discouraged.

Night Routine (Rātricharyā)

Avoid stimulating activities post-sunset. Light meditation, prayer, or mantra chanting such as “Om Śāntiḥ Śāntiḥ Śāntiḥ” supports mental relaxation and melatonin secretion. Sleep is advised by 10 PM, aligning with Kapha dominance and the natural hormonal repair window.

This integrative protocol serves as a daily rasāyana—one that gradually shifts the individual from a state of imbalance (vikṛti) to their optimal constitution (prakṛti sthiti). The lifestyle becomes a therapy in itself, ensuring ongoing maintenance of internal rhythm, psychological stability, and metabolic function.

To validate these approaches, numerous case-based reports and clinical studies have demonstrated the efficacy of this combined system.

Case Example 1: Obesity with Insulin Resistance (Kapha-Prakṛti Female, Age 42)

Presenting symptoms: Weight gain (BMI 31), fatigue, irregular bowel, elevated fasting glucose (118 mg/dL), mild depression.

Protocol followed

- Dinacharyā with early waking, abhyanga, 45 minutes of yoga asana and prāṇāyāma
- Āhāra: Two meals/day, light Kapha-pacifying diet with warm water

- Evening walks and vajrāsana post meals
- Stress management with mantra meditation and 10 minutes Yoga Nidra nightly
-

Outcomes after 12 weeks

- Weight reduced by 5.5 kg
- Fasting glucose dropped to 95 mg/dL
- Digestion improved, and sleep normalized
- Marked emotional stability and increased self-confidence

Case Example 2: Type 2 Diabetes with Hypertension (Pitta-Kapha Prakṛti Male, Age 55)

Presenting symptoms: HbA1c 7.8%, BP 150/90 mmHg, poor sleep, irritability

Protocol followed

- Dinacharyā with seasonal adjustments, daily yoga focused on twisting postures and Kapālabhāti
- Mid-day as the main meal, with bitter vegetables and barley included
- Dhyāna practice twice daily using breath awareness

Outcomes after 16 weeks:

- HbA1c improved to 6.4%
- BP normalized to 130/84 mmHg
- Improved sleep quality
- Reduced dependence on anxiolytics

These real-life applications highlight the practical and reproducible value of a Swasthavṛtta-Yoga integration in treating metabolic syndrome. Rather than relying solely on drugs or external interventions, patients reclaim agency through structured behavior, thereby improving compliance, long-term outcomes, and psychological satisfaction.

In group settings, this model has been adapted for community-based programs. Pilot projects in rural Ayurvedic centers and urban wellness clinics have shown that when people are taught Dinacharyā and basic Yoga with individual dietary advice, not only do metabolic parameters improve but so does community morale and peer-supported accountability.

Furthermore, research trials have begun to quantify the biomarker shifts seen with these interventions. Changes in fasting insulin, leptin, adiponectin, hs-CRP, and heart rate variability (HRV) reflect improvements in both metabolic and autonomic function. These biological shifts are concurrent with behavioral transformation—a unique outcome not often achieved by pharmacotherapy alone.

It is also worth noting that this approach is scalable and sustainable. There is no reliance on expensive technologies or imported supplements. The ingredients of healing—fresh food, clean air, body movement, ethical behavior, and silence—are universally available, waiting to be rediscovered through a disciplined lifestyle.

Thus, protocols based on Swasthavṛtta and Yoga not only serve as an alternative to conventional therapy but as a complementary and enduring foundation. In both individual cases and population health strategies, they offer a model that is personalized, ethical, spiritual, and biologically intelligent—qualities urgently needed in contemporary healthcare systems.

Challenges and Recommendations for Modern Application

While the combined framework of Swasthavṛtta and Yoga offers a time-tested and holistic strategy for the management of metabolic syndromes, translating these classical concepts into modern clinical and public health practices is not without its challenges. To effectively harness their potential in today's context, it is crucial to acknowledge the structural, social, cultural, and individual barriers that hinder widespread adoption—and simultaneously propose viable pathways for integration and transformation.

One of the primary challenges lies in behavioral resistance and lifestyle inertia. The very nature of metabolic syndrome is rooted in poor lifestyle choices that are deeply ingrained in modern routines—late-night working, processed food consumption, chronic stress, and sedentary habits. For many individuals, the idea of shifting to an Ayurvedic-Yogic routine that demands early waking, regulated eating, and digital minimalism seems daunting or unrealistic. Without proper motivation and guidance, such protocols may be dismissed as “too idealistic” or “impractical.” The role of structured health coaching and step-wise behavior change models becomes essential here, enabling gradual adoption through micro-habits, tracking, and positive reinforcement.

A related issue is lack of awareness or misinterpretation of Ayurvedic and Yogic teachings. Many individuals, even within the healthcare community, view Swasthavṛtta as a set of generalized cultural norms rather than as a refined, personalized science of health preservation. Likewise, Yoga is often reduced to mere physical exercise (āsana), ignoring its psychological, ethical, and therapeutic dimensions. This oversimplification dilutes the power of these systems. Bridging this knowledge gap requires interdisciplinary education, curriculum reform in health institutions, and public health campaigns that contextualize traditional knowledge within scientific language and modern health narratives.

Another barrier is the fragmentation of healthcare delivery systems. Allopathic treatment is often compartmentalized into specialties (endocrinology, cardiology, psychiatry), while Swasthavṛtta and Yoga emphasize integrated, whole-person healing. The absence of coordinated communication between systems prevents holistic care. To overcome this, integrative medicine models—which include Ayurvedic practitioners, Yoga therapists, dietitians, and allopathic doctors working collaboratively—must be developed. Case conferencing, co-authored prescriptions, and cross-referral protocols can help establish a seamless interface.

There are also infrastructural and socioeconomic limitations in applying lifestyle-based therapies across diverse populations. While urban wellness centers may offer Yoga studios and Ayurvedic consultations, rural and underserved populations often lack access to trained professionals or educational resources. Moreover, financial priorities may push individuals toward quick-fix pharmacological options instead of long-term behavioral investment. Addressing this requires low-cost, community-based Swasthavṛtta-Yoga outreach programs, leveraging existing health workers, schools, and local leaders to disseminate practical knowledge and support behavior change.

Research and validation also pose a challenge. Despite growing studies affirming the benefits of Yoga and Ayurveda in lifestyle diseases, there is still limited large-scale clinical evidence using standardized Swasthavṛtta

protocols. Variability in prakṛti assessment, diet customization, and Yoga sequences makes it difficult to create randomized control models that satisfy modern evidence hierarchies. There is a need for transdisciplinary research frameworks that honor the individualized, ecological, and experiential nature of these systems while still producing measurable outcomes. Collaborative projects between Ayurvedic colleges, modern research institutions, and Yoga universities can build a robust scientific foundation for wider credibility.

The psychological resistance to traditional systems, especially among youth, is another hurdle. Influenced by digital culture, instant gratification, and fast-paced lifestyles, younger individuals may find it difficult to relate to concepts like brāhma muhūrta, ahimsa, or sāttvika āhāra. To bridge this gap, innovative digital tools, such as gamified wellness apps, online support groups, and personalized health trackers based on Ayurvedic principles, can be developed. By bringing Swasthavṛtta and Yoga into the digital age without compromising authenticity, these practices can resonate with modern audiences.

On a policy level, there is limited institutional support for Ayurveda-based preventive care. Most health funding still focuses on curative care rather than lifestyle modification. Governmental and non-governmental initiatives must prioritize preventive health frameworks, where Swasthavṛtta and Yoga are embedded into national health missions, school curricula, and employee wellness policies. The AYUSH ministry's current efforts must be expanded to develop certification standards, monitoring systems, and scale-up models that ensure quality, accessibility, and affordability of services.

In conclusion, while the path to integrating Swasthavṛtta and Yoga into mainstream health management for metabolic syndrome is filled with challenges, these are not insurmountable. With strategic planning, interdisciplinary collaboration, culturally sensitive communication, and institutional support, this holistic model can be scaled effectively. More than just a health intervention, it becomes a social movement of conscious living, restoring the balance not only in individual bodies but in the collective rhythm of human health and nature.

Conclusion

Metabolic syndrome represents one of the most pressing health challenges of the 21st century, arising not only from physiological dysfunctions but also from widespread lifestyle imbalances, poor dietary choices, and chronic stress. Modern medicine offers valuable tools for symptomatic management, yet it often fails to address the root behavioral and psycho-emotional factors perpetuating the condition. In this context, the integration of Swasthavṛtta and Yoga, rooted in the ancient wisdom of Ayurveda and Indian philosophy, emerges as a comprehensive, sustainable, and person-centered approach for prevention and healing.

Swasthavṛtta provides the daily and seasonal framework for balanced living, harmonizing the individual with nature's cycles and inner constitutional needs. Yoga complements this with inner awareness, breath regulation, and mind-body coherence, reinforcing the physical, emotional, and spiritual stability needed to reverse metabolic dysfunction. Together, they not only restore biological parameters but also cultivate

sattva (clarity), tapas (discipline), and svādhyāya (self-inquiry)—qualities essential for sustained transformation. When personalized according to prakṛti, agni, doṣa, and lifestyle context, this integrative model proves effective across diverse populations. Clinical experiences, growing empirical research, and public health outcomes support its efficacy. Moving forward, Swasthavṛtta and Yoga should not remain peripheral or alternative—they deserve to be central pillars of preventive and lifestyle medicine, guiding humanity toward a healthier, more harmonious existence

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