

Directions for the revitalization of Ayurveda in the 21st century

Why is Ayurveda, the Indian Health Science, not taking off on a scale that makes it much more visible on the national and global stage? One of the chief reasons for the subdued status of Ayurveda – though certainly not the sole reason – appears to be that Indian State and Central governments have put it on a starvation diet for more than 60 years (since independence), and before that, India's colonial rulers treated Ayurveda even worse. Thus for more than 150 years Ayurveda has survived largely through *community (not state) support* for its health services with subcritical public investment in research, education, clinical services, public health, development of standards and industrial production. In 2012, Ayurveda received only around 1.5% of the national health budget; at state levels, except in the state of Kerala, Ayurveda received only around 0.5% of the health budgets of the Indian states (provinces). Thus all of Ayurveda's achievements in research, product development, education and clinical practice are of an insufficient scale, which is unfortunately only noticed by the most discerning of observers. To the majority of people in India and the West the potential of Ayurveda goes unnoticed. Today, however, the time has come for the growth of Ayurveda. This is not due to a sudden upsurge of creative energy within the Ayurvedic community, but essentially because of the limitations of western biomedicine and the inevitable and serious search for alternatives.

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THE WORLD OF MEDICINE is no longer looking for blockbuster drugs aimed at single targets, it is looking for drugs that correct underlying physiological mechanisms that manifest as syndromes. Biomedical scientists are no longer looking for single molecules for infectious diseases, but rather for combinatorial drugs that may be akin to the aqueous extracts known as *kashāyams* used in classical Ayurveda. Medicine today is looking for solutions for dealing with non-communicable diseases and metabolic disorders, for enhancing immunity, for prevention and for positive health. At another social level, the huge investments in biomedicine-based strategies for primary healthcare in rural and urban communities, despite six decades of increasing investments in infrastructure, drugs and human resources – including the flagship National Rural Health Mission program launched in the 10th five year plan – still requires the majority of the population to spend around 70% of their annual health expenditure out of pocket, thus demonstrating an unsatisfactory state of health security.

This is the default situation that has brought Ayurveda to the center stage. The science of Ayurveda embodies a sophisticated theory of homeostasis and bio-regulation, and an incredible knowledge of natural products for correcting complex physiological imbalances. It possesses a wide range of dietary supplements and health practices for securing public health. It has unique detoxification procedures (*pancakarmas*) that are assumed to correct metabolism and immune functions. It has strength in geriatrics, in preventive healthcare and in strategies for enhancing wellbeing (*swasthya*). In the context of rural health, Ayurveda has an intimate knowledge of approximately 6500 ecosystem-specific plant species that can provide low cost solutions for innovative 'green health' programs that can enhance both self-reliance and the health security of rural households.¹

Can India harness Ayurveda to fulfill the two promises that it holds?

Firstly, Ayurveda promises health security for millions of rural and urban households, by promoting the reliable use of ecosystem-specific plants, elements of *ritucharya* and *dincharya* (seasonal and daily regimens) and ethnic diets. Secondly, it promises original contributions to the world of medicine and life sciences through R&D on strategic problems in the new emerging field of 'Ayurvedic biology', which bridges concepts and theories of Ayurveda with high end science in modern biology. The short answer is yes – on the condition that substantial and focused investments are made in building world-class institutions, preferably in the not-for-profit and private sectors, for translational research, integrative education, drug development and integrative healthcare services, including public

health. Thus, far from the beginning of the 1st five year national plan, to date, support for Ayurveda has been mere lip service and most of the limited taxpayers' money invested in Ayurveda has gone down the drain – with rare exceptions – into inefficient and ineffective government sector institutions. If the same scale and skew in investments in Ayurveda continue into the 12th and 13th five year plans, Ayurveda and India will miss the opportunity to become a world leader in the new era of complementary, integrative and pluralistic healthcare, which is firmly slated on the agenda of global healthcare in the 21st century.

There are huge challenges in translational research and therefore Ayurveda research institutions need the best of minds, who possess both traditional knowledge and scientific knowledge. When translational research is being attempted on a sophisticated knowledge system like Ayurveda, reliable interpretation of *slokas* [medical verses in the canons of Ayurveda] and traditional practices into science becomes crucial. Even translating poetry from one language to another involves much more than literal word for word translation. Translating a knowledge system that has fundamentally different perspectives, principles, concepts and categories, involves complexities that must be reckoned with and therefore needs very high quality human resources and relevant clinical and basic science infrastructure. The fact that Ayurveda is an evolving, living and functional knowledge system suggests that the knowledge of Ayurveda is already evidence based in its own theoretical framework. Due to the domination of western cultural and intellectual traditions in modern education, today the requirement is to revalidate Ayurveda in terms of the parameters of a globally accepted western science. This involves its translation into a new science that has a very different paradigm from its own. This is a complex task.

The first and most important step is to correlate Ayurveda concepts with those of modern biology and then develop appropriate experimental models to test Ayurvedic propositions in a rigorous fashion. This needs collaboration of the best Ayurvedic physicians and theoreticians, with the best scientists from western life- and physical sciences in order to do epistemologically informed translation and experimentation. The task calls for interpreting the systemic theories of Ayurveda into the structural frameworks of science. This program needs critical and sustained support for translational and trans-disciplinary research on strategic problems. It needs to be executed in a coordinated way by visionary and missionary leadership located in a network of institutions. Today, India has not yet created a single world-class research institution for translational research that bridges Ayurveda and modern biology, but needs at least half a dozen of them in order to make a national and global impact.

Fig. 1: Modern research at an Ayurvedic hospital.



Ayurvedic biology, Ayurvedic products, and clinical efficacy

This national and global impact could come from innovative research results obtained from the new emerging trans-disciplinary field called 'Ayurvedic biology', which bridges concepts and systemic theories of Ayurveda with structural theories of biology.² It also could come from the development of premium pharmaceutical, nutraceutical and cosmetic products derived from revalidations of high priority products selected from the vast repository of over 200,000 herbal formulations documented in Ayurvedic classical literature; or from a global appreciation for the sophisticated systemic theories embodied in traditional medical knowledge currently being imparted in over two hundred fifty Ayurvedic medical colleges in India; or from the reputation of its clinical efficacy demonstrated in the management of chronic diseases and metabolic disorders.³

There are similar opportunities waiting to be fulfilled in other areas, like clinical practice and clinical research, where India can create new models of secondary and tertiary hospitals based on integrative healthcare – with Ayurveda and yoga as the pivot – integrated with modern surgery and emergency medicine (fig. 1). In medical education there is a huge opportunity to establish world-class universities for Ayurveda with strong research, outreach and teaching programs developed in a contemporary integrative framework. The Indian Ayurvedic industry can develop blockbuster products for correcting systemic disorders if it revalidates and standardizes prioritized herbal formulations with modern tools. In primary healthcare Ayurveda can also make significant contributions for self reliance of rural communities through its knowledge base of the pharmacology of thousands of ecosystem specific species of plants. In public health Ayurveda can provide the world's cheapest solution for microbial purification of drinking water by reintroducing the traditional practice of storing drinking water in copper vessels, which results in the total eradication of all pathogenic bacteria and some viruses. These are the directions for revitalization of Ayurveda in the 21st century, which would benefit both India and the global community.

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Notes

- 1 'Green health' refers to community integrated self-help strategies based on local plants and local knowledge.
- 2 In the 12th 5 year plan, the Indian Dept of Science & Technology has a specific research program in 'Ayurvedic biology'.
- 3 See the Focus article by Ram Manohar in this issue.