Review Article

DEVELOPMENTS IN THE FIELD OF AYURVEDA - PAST TO PRESENT

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ABSTRACT

In the present era of competition and globalization, every branch of science is trying to retain its identity in the globe by reorientation and developing itself according to the needs by conducting various kinds of research. The present practice of *Ayurveda* emphasizes on traditional way. The Globalization, Patent, Intellectual Property Rights issues and Bio-piracy are becoming major challenges in the indigenous traditional medical systems like *Ayurveda*. In order to promote as a global medicine and equip *Ayurveda* to meet the global healthcare needs of the 21st century, there is an urgent need to modernize the ancient system in pace with the development of science and information technology. So considering all these facts, *Ayurveda* is needed to restructure in the global context to meet the rising demands of a cyber society with the application of Information, Education and Communication (IEC) technology. This review article highlights how the advancements have been taken in different fields of *Ayurveda* over the decades till the current scenario.

INTRODUCTION

Ayurveda, the science of life have been the first line of treatment in case of many common ailments at the community level since long time due to their acceptance and tradition among the community. *Ayurveda* attributes primary importance to preventive medicine and the maintenance of positive health. *Ayurveda*, the traditional healthcare system also is trying to prove its identity by searching newer remedies to overcome the diseases for which there is no answer in modern medical science. With the growing institutionalization of education in *Ayurveda* in the present times, need has been felt to launch research ,development and application of information technology in order to update it in terms of its understanding and application to the present need of the people.

So considering all these facts, *Ayurveda* is needed to restructure in the global context to meet the rising demands of a cyber society with the application of Information, Education and Communication (IEC) technology.

Ayurveda is a comprehensive scientific system of life, which is developed through ancient wisdom, experiences and experimentation in scientific manner. It has a long history of development from Vedic period to present era.

Developmental Milestones in *Ayurveda*[1, 2]

1000 BC	:	Origin of *Atreya* & *Dhanwantari* School of Ayurveda
600 BC	:	Documentation of *Charaka Samhita*
500 BC	:	Documentation of *Sushruta Samhita*
800 AD	:	Documentation of various *Nighantu*
900 AD	:	Development and Documentation of *Rasashastra*
1827	:	Classes in Ayurvedic Medicines opened in Govt. Sanskrit College, Calcutta
1920	:	Indian National Congress Convention at Nagpur recommended acceptance of Ayurvedic System of medicine as Indians National Healthcare system
1921	:	Mahatma Gandhi inaugurated Ayurvedic and Tibbia College in Delhi
1927	:	Mahamana M.M. Malviya established Ayurvedic College in B.H.U. Varanasi

1940	:	Enforcement of Drugs & Cosmetic Act for ASU medicines
1943	:	Bhor Committee or Health Survey and Development Committee Constituted
1946	:	Chopra Committee recommended system of old and modern system of medicine to evolve a common system of medicine
1951	:	Board of Research in Ayurveda, Bombay established
1955	:	Recommendation of Dave Committee for Uniform standards of Ayurveda education
1956	:	IPGT& RA started at Jamnagar
1958	:	Udupa Committee for Ayurvedic Research Evaluation
1964	:	Amendment of Drugs and cosmetics Act-1940 for Indian System of Medicines/Drugs
1964-65	:	Establishment of Central Board of Siddha and Ayurvedic education
1965	:	First Ayurveda University of India started at Jamnagar
1969	:	Setting up of an apex Research Body for Indian Medicine & Homeopathy (CCRIMH)
1969	:	First Ayurvedic Pharmacopoeia Committee was constituted
1970	:	Establishment of PLIM, Ghaziabad (U.P.)
1971	:	Constitution of C.C.I.M. under IMCC Act. -1970 for Regulation of Education and Practice
1976	:	Publication of AFI- part-I
	:	Establishment of NIA at Jaipur, Rajasthan
1978	:	Establishment of separate CCRAS, at New Delhi
1983	:	Establishment of IMPCL, Mohan, Almora
1988	:	Establishment of RAV, New Delhi
1995	:	Creation of Separate Department of Indian System of Medicine & Homeopathy in MoH & FW, GOI
1998-99	:	Implementation of IEC Scheme for NGO's for Propagation and Popularization of Ayurveda & other Systems
2000	:	Gazette Notification for constitution of NMPB and constitution of Advisory group for Research in Ayurveda
	:	Decision on mainstreaming of Ayurveda in RCH programme as per National Population Policy
2001	:	Exhibition and presentation of Ayurveda during world Health Assembly, Geneva
	:	Presentation on evidence based support by Dept. of ISM & H before House of Lords U.K. against Sir Walton Committee Report on status and nomenclature of Ayurveda among complementary and Alternative system of medicine
2002	:	Launching and initiation of Traditional Knowledge Digital Library (TKDL)
2003	:	Dept. of ISM & H renamed as Dept. of AYUSH
	:	First Ayurveda University of Rajasthan started at Jodhpur
2004	:	The foundation stone laying of All India Institute of Ayurveda at Delhi
	:	WHO Guidelines on safety monitoring of herbal medicines in Pharmacovigilance systems
2005	:	Initiation of Golden Triangle Research Partnership Project (CCRAS, CSIR & ICMR) for integrated technology mission for the development of Ayurveda
2007	:	Publication of API and notified as a book of standards for implementations of the Drugs & Cosmetic Act 1940 - all over India, and have been included in the First Schedule of Drugs & Cosmetic Act- 1940 as 54b.
2009	:	Gazette notification of Shelf life or date of expiry for Ayurvedic Medicines
	:	Uttarakhand Ayurved University established in Dehradun
2010	:	Gazette notification for Guideline for issue of license with respect to ASU drugs
2011	:	Ayurveda University of Punjab started in Hoshiarpur (Punjab) as Guru Ravidas Ayurveda University
2012	:	Include Ayurveda under Indian Armed Forces Medical Reimbursement Rules (Delhi High Court directed to Ministry of Defense to frame guideline within three months)
2013	:	Delhi Declaration on Traditional Medicine for the South - East Asian Countries
2014	:	Launching of National AYUSH Mission (NAM) by Central Government of India
	:	Elevation of Dept. of AYUSH to independent Ministry of AYUSH
	:	Shri Shripad Naik took charge as Minister of State (IC) of Ministry of AYUSH
	:	Declaration of June 21 as "International Day of YOGA" by United Nations Organisation

Status of Infrastructure of *Ayurveda* in India (as on 01.04.2013) [3]

1.	Hospitals	-	2408
2.	Bed Strength	-	42830
3.	Dispensaries	-	15927
4.	Practitioners	-	387976
5.	Under Graduation Colleges	-	261
6.	U.G. Admission capacity	-	10472
7.	Post Graduation College	-	76
8.	P.G. Admission capacity	-	1709
9.	Drug Manufacturing Unit	-	7744

DEVELOPMENTS IN AYURVEDIC RESEARCH

Central Council for Research in Ayurvedic Sciences-CCRAS[4]

The Central Council for Research in Ayurvedic Sciences (CCRAS), Department of AYUSH, Ministry of Health and Family Welfare, Government of India, an autonomous body for undertaking, coordinating, formulating, developing and promoting research in *Ayurveda* on Scientific lines. The activities are carried out through 30 Institutes/Centers/Units located at different states across the country and also in collaboration with reputed academic and research organizations. The broad areas of research comprise Medicinal Plant Research (Medico-ethno Botanical survey, cultivation, Pharmacognosy), Drug standardization Research, Pharmacology Research (Preclinical Safety/Toxicity and Biological Activity Studies), Clinical Research, Literary Research & Documentation. The extension activities include Tribal Health Care Research, Health Care Services, Information, Education and Communication (IEC) etc. Council administers IMR and EMR Scheme for Research.

Some notable achievements of CCRAS [5]

1. AYUSH- 64 for Malaria, Patent Granted
2. AYUSH-56 for Epilepsy - Patent Granted
3. AYUSH-82 for Diabetes Mellitus
4. 777 oil for Psoriasis- Patent Granted
5. AYUSH face pack for Hyper pigmentation
6. Ayushman-8 for Mental Retardation
7. Bal-Rasayan - For General immunity in children - Patent Granted
8. AYUSH- Ghutti- For Cough & Cold in children - Patent Granted
9. AYUSH KVM Syrup - For Pediatric Cough, Cold, Fever
10. AYUSH BR Leham - For Pediatric Care

Summary of Status of IPR Protection and commercialization [6]

1.	Patents Granted in India	-	17
2.	Patents Filed in India	-	15
3.	Technology Transferred to industry	-	12
4.	Patent Filed and Granted in abroad	-	01

Golden Triangle Research Partnership Project (GTP) [7]

Golden Triangle Research Partnership initiated by Department of AYUSH with collaboration of CCRAS, ICMR and CSIR is aimed at scientific validation and development of R&D based drugs as well as development of herbal drugs based on traditional medicinal knowledge for prioritized disease conditions. Ayurveda, Siddha, Unani and Homeopathy drug industry is being associated with this initiative. For expediting the work of laying down pharmacopoeia standards of single drugs and poly-herbal formulations, the research councils have been declared as the Secretariats of the Pharmacopoeias Committees.

Natural Resource Base of AYUSH [8]

The resource base of AYUSH is largely plants. Around 6000 species of medicinal plants are documented in published medical and ethno-botanical literature. Wild population of several hundreds of these species is under threat in their natural habitats. In the Tenth Plan, a National Medicinal Plants Board (NMPB) was established for supporting conservation of gene pools and large scale cultivation of medicinal plants. The NMPB has also promoted the creation of State Medicinal Plants Board in most of the States. In addition to plants, there are also around 300 species of medicinal fauna and around 70 different metals and minerals used by AYUSH.

Indian Medicines Pharmaceutical Corporation Limited (IMPCL) [9]

IMPCL is a Government of India Enterprise under the administrative control of AYUSH, MoH&FW. The company is a Mini Ratna Category II. The company had obtained an ISO 9001-2008 Certificate. Company was setup with the objectives to supply medicines to the Central Government Hospitals and Central Government Research Units all over India and to certain State Government related departments, besides sales in the open market. The company is situated at Mohan, Via Ramnagar, Distt. Almora, Uttarakhand.

Pharmacovigilance Programme for ASU Drugs [10]

Worldwide movement for the improvement of patient safety is gaining momentum hence the subject of drug safety becomes even more prominent in the present day scenario. Pharmacovigilance is defined as the detection, assessment and prevention of adverse drug reactions (ADR's) in humans. In India, National pharmacovigilance programme under the control of Central Drug Standards Control Organization (CDSCO) has already been started since 2003. WHO had emphasized that it should include traditional medicines in pharmacovigilance system and has published guidelines on safety monitoring of herbal medicines in pharmacovigilance systems in 2004. Govt. of India has declares IPGT & RA Jamnagar as National Resource Centre for this programme.

AYUSH Research Portal [11]

It is an evidence based research data of AYUSH Systems at global level developed by Department of AYUSH, Ministry of Health & Family Welfare, Government of India. Development and Maintenance of AYUSH research works in an organized fashion to prevent duplication of work, to encourage interdisciplinary research and generate evidence for wider acceptance of AYUSH systems worldwide. It is continuously updated and monitored portal system prepared by NIIMH, Hyderabad.

AyuSoft: A Decision Support System for *Ayurveda* [12]

AyuSoft is a vision of converting classical Ayurvedic texts into comprehensive, authentic, intelligent and interactive knowledge repositories with complex analytical tools. It is pioneering multidimensional effort for Indian traditional medicine system. With AyuSoft your health decisions are expected to be more informed, accurate and quicker. Health decisions are expected to be more informed, accurate and quicker with the help of AyuSoft. AyuSoft is available in a desktop, intranet and internet versions. It is developed by Centre for Development of Advance Computing (C-DAC) Pune under Department of Information Technology, Govt. of India, Interdisciplinary School of Health Sciences, University of Pune and Department of *Ayurveda*, University of Pune. AyuSoft development team consists of IT Professionals and Ayurveda experts of National as well as International repute. Its target is End-users include Hospitals, Practitioners, and Researchers.

Wide Range of Applications of AyuSoft

1. Disease, Diagnosis and Treatment
2. Constitution (Physiological and Psychological) and Tissue Quality Assessment
3. Diet & Life Style Advice
4. Personal Information Management System (PIMS)
5. Multimedia based Encyclopedia
6. Textual & Graphical Analytical Report tools

Integrated Clinical Decision Support System- ICDSS [13]

CCRAS has developed "Integrated Clinical Decision Support System'' (ICDSS) intended to provide an easy to use, standard Electronic Health Record (E.H.R.) for AYUSH teaching, Hospitals and Research Councils. It contains information in the set format with respect to Disease Pathology, Symptoms, Signs, Investigations, Treatment Plan, Medicines, Procedures, Disease Counselling, Life Style advice from *Ayurveda* and Biomedicine.

Ayurgenomics [14]

A study, the first of its kind in the world, finds links between *Prakriti*, a fundamental principle of personalized medicine of *Ayurveda* and modern genomics for development of predictive and personalized medicine. The study reveals that it is possible to identify groups within normal individuals of the populations, which could be predisposed to certain kind of diseases and also might respond differently to drugs. Such integration of the principles of *Ayurveda* and genomics, appropriately termed as Ayurgenomics by the authors, holds great potential and promise for future predictive and personalized medicine.

CSIR Ayurgenomics unit - TRISUTRA (Translational Research and Innovative Science through Ayurgenomics - TRISUTRA) has taken this initiative to identify strategies / develop affordable health care solutions through integration of traditional knowledge of *Ayurveda*, genomics and modern medicine. An inter-disciplinary network centre that would enable cross link between *Ayurveda*, modern medicine and genomic science, is being established to achieve its objectives.

Traditional Knowledge Digital Library (TKDL) [15]

The TKDL is an original proprietary database, which is fully protected under national and international laws of Intellectual Property Rights (IPR). The CSIR, DSIR and Department of AYUSH are the joint owners of the TKDL Database. At the core of the project it is the innovative approach in the form of Traditional knowledge Resource Classification (TKRC) that enables conversion of information, containing 2.12 lakh formulations (Ayurveda 82,900; Unani 1,15,300; Siddha 12,950) described in 148 texts available in public domain. Patent compatible format in various language viz. translation of Sanskrit *Slokas* (verses) into not only Hindi but also English, French, German, Spanish, Japanese.

AYUSH under NRHM [16]

The AYUSH interventions under NRHM are

1. Co-location of AYUSH dispensaries in 3528 PHCs in different States.
2. Appointment of AYUSH doctors and paramedics (Pharmacists) on contractual basis in the primary health care system.
3. Inclusion of AYUSH modules in training of ASHA.
4. Inclusion of "*Punarnavadi mandoor*" in the ASHA Kit for management of anemia during pregnancy.
5. Inclusion of seven Ayurvedic and five Unani medicines in the RCH programme.
6. Establishment of specialty clinics, specialized therapy centers and AYUSH wings in district hospitals supported through CSS.

DEVELOPMENTS IN AYUSH DRUGS, PHARMACEUTICALS & REGULATIONS

Essential Drugs list (EDL) [17]

Drug Control Cell of Department of AYUSH has issued Essential Drugs List – Ayurveda in March 2013. The Essential Drugs List has been prepared with a consultative process based on inputs received from a number of stakeholders and the focus given to include

only generic medicines from pharmacopeia, formulary and authoritative texts. The Essential Drugs List – *Ayurveda* will act as a guiding tool for the procurement agencies to fulfill the supply of Ayurvedic Medicines in dispensaries, hospitals and co-located *Ayurveda* facilities in the PHCs, CHCs and District Hospitals. Previously it is published in the year 2000. It contains total 277 medicines.

Pharmacopoeial Laboratory for Indian Medicine (PLIM) [18]

Government of India established PLIM as an organization in 1970 to monitor the quality of *Ayurveda*, Unani and Siddha drugs. This is an apex laboratory helping to lay down the standards of Ayurvedic medicines. It is the approved laboratory under the Drug and Cosmetic Act, 1940. This laboratory is situated in the Kamla Nehru Nagar, Ghaziabad (U.P.). This laboratory also attends the enquiries from various sectors and individuals in respect of Standardization, Testing/Analysis of ISM Drugs and also about Medicinal Plants.

Pharmacopoeia Commission for Indian System of Medicine (PCIM) [19]

Pharmacopoeia Commission for Indian System of Medicine consists *Ayurveda*, Siddha & Unani Medicine which are thousands years old, used by Indian public. There is a large demand of Herbal Medicines all over the world and many countries adding monographs of herbal drugs in their Pharmacopoeias. To lay down Pharmacopoeia Standards, Govt. of India has three Pharmacopoeia Committee viz., Ayurvedic Pharmacopoeia Committee, Siddha Pharmacopoeia Committee & Unani Pharmacopoeia Committee to lay down Pharmacopoeial Standards for Ayurvedic, Siddha & Unani drugs. Pharmacopoeial Laboratory for Indian Medicines, Ghaziabad is only laboratory to develop pharmacopoeial standards at present.

The traditional medicines and natural/herbal products have global demand. Therefore, the proposed Commission will work on the lines of other pharmacopoeia commissions of the world like US Pharmacopoeia Commission, EU Pharmacopoeia Commission and British Pharmacopoeia Commission. The Pharmacopoeia Commission for Indian Medicine will cater to the need of ASU Pharmacopoeia Committees and PLIM. This will be a fully autonomous organization registered under Society Act. The organizational set up of the Commission has been proposed to be a pure scientific body having full autonomy to recruit and co-ordinate scientists, utilize funds more efficiently and also generate resources to meet the targets of the commission.

Drugs & Cosmetics Act [20]

The principal legislation that deals with the various drugs related issues including standards of quality, misbranded drugs, adulterated drugs, spurious drugs, prohibition of import of certain drugs, power of Central Government to prohibit import of drugs in public interest, offences, confiscation, jurisdiction, manufacture, sale, distribution, etc., is the Drugs & Cosmetics Act, 1940 - A Central law. The same legislation deals with various aspects of Ayurvedic and Unani drugs under a separate chapter. (Chapter – IVA). The Drugs & Cosmetics Rules, 1945 framed by the Central Government to give effect to the various provisions of Drugs & Cosmetics Act deals with the appointment of licensing authorities to consider grant or renewal of licenses to manufactures of Ayurvedic and Unani Drugs.

A Drug Control Cell (AYUSH) is working in the Ministry of AYUSH to deal with the matters pertaining to Drug Quality Control and regulation of ASU & Homeopathy drugs under the provision of Drugs & Cosmetics Act, 1940 and Rules there under.

Good Clinical Practice Guidelines for ASU Medicines[21]

The Department of AYUSH has issued good clinical practice (GCP) guideline in March 2013 for clinical trial in *Ayurveda*, Siddha and Unani (ASU) medicines which will facilitate the researcher and institutions in adopting a standard way of good practice while conducting the ASU clinical trials. The GCP is a set of guidelines which encompasses the design, conduct, termination, audit, analysis, reporting and documentation of the studies involving human subjects. These guidelines are formulated based on CDSCO Document on GCP Guidelines (2001) for Clinical Trials on Pharmaceutical Products. The guidelines seek to establish two cardinal principles: protection of the rights of human subjects and authenticity of ASU medicine clinical trial data generated.

Scheme for Development of AYUSH Clusters[22]

The *Ayurveda*, Yoga and Naturopathy, Unani, Siddha & Homeopathy (AYUSH) industry represents the traditional form of Indian medicine, and has been part of India's socio-cultural heritage. The industry that has approximate annual turnover of Rs.12000 Crore is essentially dominated by micro, small and medium enterprises (MSMEs) which account for more than 80% of the enterprises that are located in identifiable geographical clusters.

The market for traditional health medicine has been increasing steadily, the world over. Although AYUSH industry has been one of the most traditional form of medicine, it has not been able to exploit the emerging market opportunities, primarily due to constraints such as: fragmentation of the industry, lack of standardization of raw material and the finished products, inadequate R&D, slow pace of modernization of production processes and technology, absence of focused marketing and branding, inadequate emphasis on HRD and others due to which AYUSH Sciences are not recognized as Medical & Health Care Sciences AYUSH industry has the potential to contribute

positively to National Health Programme by providing traditionally and historically proven healthcare solutions.

Cluster based approach is increasingly being recognized as an effective and Sustainable strategy for competitiveness enhancement of MSMEs. Such an approach, which leverages the geographical proximity of the enterprises on 'collaborating while competing' principle is participatory, cost effective and provides critical mass for customization of interventions.

It is in this context that this scheme for AYUSH clusters' development was introduced during the XIth plan and is being implemented during the XII Five Year Plan.

Quality Assurance Campaign[23]

In the traditional mode of regulation practiced worldwide, the government itself is the regulator, lays own standards to be complied with and checks compliance to such standards through its own inspection machinery and laboratory network. There are a number of such regulations in India including Food and Drug regulatory regimes. There is a growing trend worldwide to shift from the above traditional approach to the utilization of professional, third party bodies for various purposes for administering regulations. This has especially become relevant and a need for establishing equivalence of standards as well as conformity assessment mechanisms has grown. Accordingly a concept of accreditation has developed worldwide under which competence of conformity assessment bodies, namely Inspection Bodies (IBs) Certification bodies (CBs) and laboratories is evaluated to common international standards for facilities acceptance of their inspection reports, certifications and/or test reports worldwide. Quality Council of India (QCI) was asked for this endeavor and it was selected as Accreditation Body. The following tasks were assigned as per MoU signed.

A. Voluntary Certificate Scheme (VCS) for AYUSH Products

QCI is assigned for preparing Scheme document as well as Promotion of the Scheme.

i) This Scheme has been started since October, 2009.

ii) For Domestic Market as well as for International Market i.e. AYUSH Standard and AYUSH Premium Marks are available. The voluntary Certification Scheme for AYUSH Products would result in a quality seal being awarded to those who opt for third party evaluation. Till now two Certification Bodies named FOODCERT, Hyderabad & Bureau Veritas, Bombay has been identified.

B. Accreditation of AYUSH Hospitals

i. This Scheme has been started since January, 2010. QCI has published Accreditation and Structural Standards for AYUSH Hospitals in consultation with Department of AYUSH.

ii. As Per available information three *Ayurveda* hospitals have been accredited so far.

iii. Gap Study of AYUSH Drug Testing Labs

iv. QCI has done Gap Study of Six State Drug Testing Lab viz Chennai, Bangalore, Hyderabad, Thiruvananthapuram, Joginder Nagar (H.P) and West Bengal.

AYUSH Mark[24]

Quality Council of India has been engaged for voluntary certification of quality of *Ayurveda* Siddha Unani (ASU) products. Through this scheme drug manufacturers are awarded quality seal to the products on the basis of third party evaluation of the quality, subject to fulfilment of the regulatory requirements. AYUSH Standard and AYUSH Premium Marks are awarded for products moving in domestic and international market respectively. 146 ASU products are reported to have been awarded AYUSH Premium Mark and 97 products AYUSH Standard Mark.

DEVELOPMENTS IN AYURVEDIC EDUCATION

In *Ayurveda* the process of learning, research and clinical practice are scientific and evidence based. The knowledge is scientifically validated through *Pramanas*, the most evidence based approaches viz. [25]

1. *Pratyaksha* (Direct Perception)
2. *Anumana* (Logical Inference)
3. *Aptopdesha* (Authentic Documentary Testimony)
4. *Yukti* (Experimental Evidence)

Education is a lifelong process therefore anytime anywhere access to it is the need. Education should meet the needs of variety of learners and therefore IT is important in meeting this need.

Under Graduate Teaching: - Generally based on

1. Keen knowledge of all subjects
2. Conceptual & Textual basis
3. Clinical uses of medicines
4. Theoretical and clinical exposure

Post Graduate Teaching: - Generally based on

1. Research insights
2. Innovative ideas
3. Newer applications
4. In depth of subjects knowledge
5. Good Clinical experiences & applications
6. Soft skills, Independent & Original thinking
7. Up to date information, Presentation Skill
8. Research Methodology & Biostatistics
9. Development of technologies & products
10. Value addition to scientific knowledge

Educational Courses [26, 27]

1. B.A.M.S. - Ayurvedacharya
2. M.D. / M.S. (Ay.) - Ayurveda Vachaspati
3. Ph. D. (Ay.) - Ayurveda Vidhya Varidhi
4. Ayurveda Nursing

5. Ayurveda Pharmacist

6. Two year course of Member of Rashtriya Ayurveda Vidyapeeth (MRAV) for M.D. /M.S. (Ay.)

7. One year course of Certificate of Rashtriya Ayurveda Vidyapeeth (CRAV) for BAMS

8. P.G. Diploma (2 years) in Panchakarma, Herbal Drug Standardization, Neonatal Care, Maternal Health Care, Ksharsutra, Radiology (at B.H.U. Varanasi)

9. P.G. Certificate (2 years) in Panchakarma (at Manipal University, Karnataka)

10. P.G. Diploma in Medical Plants, M.Sc. in Medicinal Plants, B.Pharmacy (Ayurveda), Diploma in Herbal Drug Manufacture (at IPGT&RA Jamnagar)

11. MBA Biotechnology (at University of Pune)

12. Hospital & Health Management, Acupuncture, Geriatric Medicine, Disability management, Medical informatics, Medical laws (at IGNOU)

13. Diploma in Yoga & Naturopathy (NDDY), Certificate course in Nutrition & Sports Medicine by Apollo Hospital Group, Hyderabad

14. PG Diploma in Clinical Research

15. Hospital Administration, Public Health Management & Preventive Healthcare, Medical Journalism, Medical Jurisprudence

16. Medical Tourism, Advance Diploma in Patent and Regulatory Management, Professional Diploma in Clinical Research courses etc.

Development and Up-gradation of AYUSH Institutes/Colleges [28]

Centrally Sponsored Schemes being implemented by the Department for development of AYUSH Institutions. The Scheme has following components

1. Development of UG Colleges
2. Assistance to P.G. Medical Education
3. ROTP for AYUSH Personnel
4. Renovation and strengthening of Hospital wards of Govt./Govt. aided teaching Institutes
5. Establishment of Computer Laboratory for use of information technology in promoting the educational standards
6. Up-gradation of academy institutes to the status model institutes of AYUSH

Central Council of Indian Medicine (CCIM) [29]

The CCIM is the statutory body constituted under the Indian Medicine Central Council Act, 1970. The CCIM has been framing on and implementing various regulations including the Curricula and Syllabi in Indian Medicine viz. *Ayurveda*, *Siddha* and *Unani* Tibb at Under Graduate and Post Graduate level.

The main objectives of the Central Councils are as under

1. To prescribe minimum standards of education in Indian Systems of Medicine viz. *Ayurveda*, Siddha, Unani Tibb.

2. To advice Central Government in matters relating to recognition (Inclusion/ withdrawal) of medical qualification in/from second schedule to Indian Medicine Council Act, 1970.

3. To maintain a Central Register on Indian Medicine and revised the Register from time to time.

4. To prescribe Standards of Professional Conduct, Etiquette and Code of Ethics to be observed by the practitioners.

CCIM is committed for quality education of the students of ISM, development of system of ISM in each and every aspect by which the world wide awareness and acceptance of these ancient Indian system of medicine can be increased.

National Institute of Ayurveda (NIA) [30]

The National Institute of Ayurveda, Jaipur is an apex Institute under the department of AYUSH, MoH & FW, and Govt. of India for promoting the growth and development of Ayurveda as a model Institute and for evolving high standards of teaching, training, research and patient care and also to invoke scientific outlook to the knowledge of Ayurvedic system of Medicine. The Institute is first of its kind in India having a National character and International repute.

The Institute is presently imparting the Graduate Course of BAMS, the Post Graduate Course of MD/MS (Ay.), Regular Fellowship Program leading to the award of Ph.D. (Ay.), a Diploma Course in AYUSH Nursing and Pharmacy, a Panchakarma Attendant Training Course and also Short-Term Courses for Foreign Medical Doctors and Medical Professionals. It has a 354 Bedded Hospital with Deluxe and Cottage Wards. There are nearly a dozen Specialty Clinics, Centres of Excellence for various diseases, a Satellite Hospital, separate Panchakarma Unit etc. More details on these activities are available in the Website at the respective links.

Institute of Post Graduate Teaching and Research in Ayurveda (IPGT&RA) [31]

In the year 1952 Government of India had established a research center for Ayurveda at Jamnagar. Further a Post Graduate Training Center in Ayurveda was also started in the year 1956. These two institutes were amalgamated in 1963 and renamed as Institute of Post Graduate Teaching and Research. This Institution is fully financed by Government of India and administrated by Gujarat Ayurved University. This premier postgraduate teaching Institution of Ayurveda has best facilities available for teaching and research in Ayurveda. Till date nearly 1300 Post Graduate theses

have been submitted and awarded the degree. Nearly 130 theses have been awarded the degree of Ph.D.

Institute of Medical Sciences (IMS-BHU) [32]

The Institute of Medical Sciences (IMS) is one of the pioneer institutes of Banaras Hindu University in Varanasi. Medical education in Varanasi, the oldest living city of the world, dates from the days of Sushruta 500 BC. Infact this is also the history of Medical education in India. The great treatise - 'Sushruta Samhita' is a living testimony of contributions to Medical education that originated in Varanasi, Sushruta was the first to perform cadaver dissections and described a number of operating instruments and surgical operations. Medical education in Banaras Hindu University took roots in 1920 with the establishment of Department of Ayurveda under Faculty of Oriental Learning and Theology (1922-1927). In 1960 the Ayurvedic College was converted to the College of Medical Sciences with Professor K.N. Uduppa as its founder principal. The College of Medical Sciences then had 10 Departments - 9 in Modern Medicine and 1 in Indian Medicine. In 1978, the existing Faculty was bifurcated into the Faculty of Ayurveda and Faculty of Medicine to facilitate their independent growth. Faculty of Ayurveda, which conducts BAMS, B.Pharma (Ayurveda), MD (Ayurveda) and MS (Ayurveda), and Ph.D courses besides a few postgraduate Diploma courses.

Rashtriya Ayurved Vidyapeeth (RAV) [33]

Rashtriya Ayurved Vidyapeeth (National Academy of Ayurved) New Delhi was established on 11th Feb. 1988 with main objective of promoting knowledge of Ayurveda. The Vidyapeeth initiated the course of Member of RAV with an effort to revive the traditional method of *Gurukula* system of informal education of India i.e. *Guru Shishya Parampara.* The basic idea of this course is to provide in-depth knowledge and prepare young scholars, proficient in texts of Ayurveda, who can become good teacher so that the tradition of education of Ayurvedic system of medicine, in its true sense, continues.

The Vidyapeeth, in an effort to preserve such clinical practices and formulations and transfer to young Vaidyas, started a course of Certificate of one year duration in 1999. The Vidyapeeth has been organizing Seminars/Conferences/Workshops every year on specific subjects and also Interactive Workshops between Students and Teachers of Ayurveda to provide clarification on topics of controversy arising during day to day practice, teaching and research.

All India Institute of Ayurveda (AIIA) [34]

The proposal of establishment of AIIA at New Delhi has emanated from the then Honorable Prime Minister (Shri Atal Bihari Vajpayee) declaration to set up state of the art National Ayurveda Hospital on 5th May, 2000 under the aegis of All India Ayurveda Congress. Outpatient services already started on the 26th October, 2010. As per the targets, the All India Institute of Ayurveda would be functional as earlier.

DEVELOPMENTS IN THE PROMOTION OF AYURVEDA

AYUSH CHAIRS [35]

AYUSH Department is taking efforts to position India as a leader in Ayush education across the globe, especially in the SAARC countries, by forging links with the academic bodies and setting up chairs in the foreign universities. The Department also has chalked out a number of steps to strengthen the national institutes under it.

The Department of Ayush has decided to take the help of the Indian Missions abroad to further promote the Ayush education of the country. The national institutes under the Department have been asked to work out possible collaborations with the institutes abroad, under the guidance of the Ministry of External Affairs.

The Missions would also be consulted to set up chairs in foreign universities and finalise the same on case to case basis depending on the merit and benefits. The MoUs under the ICCR Guidelines would be signed for setting up chairs and reciprocal recognition of foreign degrees in Ayush streams between India and SAARC countries.

The Director General of Central Council for Research in Unani Medicines has been entrusted the task of preparing standard MoUs and take lead role to coordinate the work on reciprocal recognition of Ayush streams with SAARC countries. Director, National Institute of Siddha, Chennai has been asked to explore the possibility of exchange programmes in Ayush education with Government of Sri Lanka.

Director of Institute of Post Graduate Teaching and Research in Ayurveda will prepare an action plan on how the Research Councils and Institutes could work together to achieve the national objectives of better health care.

National Institute of Ayurveda involved establishing Ayurveda Chair in the Jeonju University of South Korea and Study Chairs of Ayurveda in Germany and South Africa.

National Campaigns [36]

CCRAS has launched 5 composite National Campaigns in specific areas as per the direction of Dept. of AYUSH to create greater awareness among the health providers, policy makers, executives, media persons and common people about the strength of AYUSH in specific fields.

The composite National Campaigns have been launched in six identified states viz. Orissa, Bihar, M.P., Assam, Rajasthan and Punjab in the First Phase (Year 2009-2010) at State and District levels on following subjects-

1. Ksharsutra for Ano-rectal Disorders
2. Geriatric care through Ayurveda & Siddha
3. Anaemia Control through Ayurveda & Siddha
4. Management of Chronic diseases through Ayurveda
5. Mother & Child Health care through Ayurveda

In the Second phase (Year 2010-2011) these campaigns are completed in 8 selected states through CCRAS Institutes viz. Tripura, Uttaranchal, Himachal Pradesh, Chhattisgarh, Jammu & Kashmir, Andhra Pradesh, Maharashtra and Gujarat.

AROGYA Fair [37]

Department of AYUSH, MoH & FW, Govt. of India in collaboration with FICCI are jointly organizing "Arogya Health Exhibitions" on Ayurveda, Yoga & Naturopathy, Unani, Siddha and Homeopathy.

AROGYA Fair gives a suitable platform for

1. To showcase the strengths and potential of Indian Systems of Medicines.

2. To exhibit the Research & Development efforts in this sector.

3. To interact with practitioners and consumers and other stake holders.

4. To project future trends and requirements in the AYUSH healthcare sector.

5. To create awareness among the individuals and professionals about AYUSH system of medicines.

6. To harness the potential of this fast growing and globally emerging sector.

The Dept. of AYUSH has introduced Central Sector Scheme "Incentives to AYUSH industries for participation in Fairs" with the objective to encourage AYUSH Drug Manufacturers to participate in Fairs organized to create awareness among the masses about AYUSH Sector in India and abroad.

Some venue of AROGYA Fair

Srinagar, Patna, Kolkata, Chennai, Hyderabad, Jaipur, Ajmer, Bhatinda, Ludhiana, Bhuvaneshvar, New Delhi, Dehradun, Bangalore, Indore, Amritsar, Mumbai, Kochi, Shilong etc.

AYUSH Gram [38]

AYUSH Gram is a concept wherein one village per block will be selected for AYUSH interventions of health care. The overall health checkup of the entire population will be done by AYUSH doctors based on AYUSH systems and they will be provided basic knowledge for promotion of health and prevention of diseases. The communities will be educated about healthy practices and advantages of traditional food items used locally and their medicinal properties. The AYUSH doctors will also undertake health checkup camps at schools in and around the selected villages. AYUSH training will also be imparted to ASHAs, Anganwadi workers, school teachers etc. Awareness

building activities would be conducted through grampanchayats involving schools, anganwadis, self-help groups and other community organizations. The villages near to PHCs having road connectivity will be selected for this program. Treatment for sick people will be provided through the PHC. This kind of program is already being implemented in Chhattisgarh and Gujarat states and has been found successful in AYUSH and community health promotion.

AYUSH Telemedicine Services [39]

Medicine assisted with new communication technology i.e. Telemedicine has facilitated the outreach of health services to remote rural populations settled particularly in difficult terrains. Department of AYUSH with the intention of increasing the outreach of AYUSH services facilitated a pilot project of Telemedicine. The Project was selected for 'Sindhia Award' given by Telecom Ministry and recently conferred with e-world 2011 July Choice Award under the Best Public Private Partnership initiative category jointly instituted by the Centre for Science, Development and Media Studies (CSDMS), Ministry of Communication & Information Technology, and Department of Telecom. The Project will be supported through the 'AYUSH and Public Health' Scheme.

AYUSH and IEC [40]

In order to disseminate information in a comprehensive manner, the department of AYUSH redesigned the newsletter of the department as "Ayush" bilingually. The newsletter has been widely distributed amongst all Departments of the government of India, NGO's and also distributed in AROGYA Fair. The Department also published Calendar, conveying information about all the six recognized systems propagated by the Department of AYUSH. Seven audio spots on various systems under the Department were broadcast over Indraprastha Channel of All India Radio.

Publications of Ayurveda (Journals & Magazines) [41]

1. International Journal of Ayurveda Research (I-JAR) - an AYUSH Publication
2. Journal of Research in Ayurveda & Siddha (JRAS) by CCRAS
3. Journal of Research and Education in Indian Medicines (JREIM) by CCRAS
4. Journal of Drug Research in Ayurveda and Siddha (JDRAS) by CCRAS
5. Journal of Indian Medical Heritage (JIMH) by NIIMH, Hyderabad
6. Journal of Ayurveda & Integrative Medicine (J-AIM) from Bangalore
7. International Journal of Ayurvedic and Herbal Medicine
8. Journal of Ayurveda from NIA, Jaipur
9. AYU from GAU, Jamnagar
10. International Journal of Ayurveda and Pharma Research (IJAPR), Hyderabad, Telangana

11. AYUSHDHARA, Hyderabad, Telangana
12. Aryavaidyam from Aryavaidya Sala, Kottakal, Kerala
13. Journal of Clinical Rheumatology in Ayurveda (JRCA) from Coimbatore
14. Indian Journal of Natural Products- from Sagar (M.P.)
15. Indian Journal of Indigenous Medicine
16. Ancient Science of life - from Coimbatore
17. Natural Remedies - from Bangalore
18. Global Ayurveda Magazine - from Kochi
19. Kerala Ayurveda Vaidyam
20. Complementary and Alternative Medicine – CAM.
21. Journal of Medicinal and Aromatic Plant Sciences - from Lucknow
22. PROBE - Himalaya Herbal Healthcare, from Bangalore
23. Other Magazines - Ayurved Mahasammelan Patrika, Ayurveda Vikas (Dabur), Ayurvedaline (Like MIMS, CIMS), Ayurved Sandesh, Ayurved Visheshajna, Ayurvidya, Swasthya (Kaleda, Ajmer), Sudhanidhi, Sachitra Ayurved (Baidyanath), RENAISSANCE, Nirogdham, Niramaya, The Antiseptic etc.

Publications by Government of India [42]

1. The Ayurvedic Formulary of India (Part I and II)
2. The Ayurvedic Pharmacopeia of India (Part I and II)
3. Data-Base of Medicinal Plant used in Ayurveda (Vol.1-8)
4. Pharmacognosy of Indigenous Drugs (Vol. I, II, III)
5. Indian Medicinal Plants (Vol. 1-10)
6. Quality standard of Indian Medicinal Plants (Vol 1-10)
7. Classical Ayurvedic Prescription for Common Diseases - CCRAS
8. Guideline for Methodology and Research and Evaluation of Traditional Medicine (WHO 2001)
9. Guidelines on Basic Training and Safety in Panchakarma - CCRAS
10. Woman and Child Health Care Through Ayurveda - CCRAS
11. A Manual for Doctors on Mainstreaming of AYUSH under NRHM- Dept. of AYUSH, MoH&FW, GOI.
12. Good Clinical Practice Guidelines for Clinical Trials in Ayurveda, Siddha and Unani Medicine (GCP – ASU) – Dept. of AYUSH, MoH&FW, Govt. of India, New Delhi, March, 2013

Some Video / CDs. (By CCRAS) [43]

1. Science of life
2. Panchakarma
3. Ksharsutra
4. Charak Samhita e-book
5. Sushrut Samhita e-book
6. Madhavanidan e-book
7. e-Nighantu

8. AFI
9. API
10. Resurgence
11. Panacea

Related Websites (Links) [44]

1. www.indiamedicine.nic.in
2. www.ccras.nic.in
3. www.ccimindia.org
4. www.nia.nic.in
5. www.ravdelhi.nic.in
6. www.nmpb.nic.in
7. www.imsbhu.nic.in
8. www.raujodhpur.org
9. www.ayurveduniversity.com
10. www.graupunjab.org
11. www.mohfw.nic.in
12. www.impclmohan.nic.in
13. www.impcops.com
14. www.icmr.nic.in
15. www.ctri.nic.in
16. www.cimap.res.in
17. www.nbri-lko.org
18. www.ijaronline.com
19. www.niimh.org
20. www.dharaonline.org
21. www.csir.res.in
22. www.icriindia.com
23. www.admaindia.com
24. www.cazri.res.in
25. www.dst.gov.in
26. www.iaim.edu.in
27. www.plimism.nic.in
28. www.nlm.nih.gov
29. www.ayu-careerhelpline.com
30. www.ignou.ac.in
31. www.iiaim.in
32. www.medvarsity.com
33. www.manipal.edu
34. www.unipune.ernet.in
35. www.tdb.gov.in
36. www.ayurved.rajasthan.gov.in
37. www.amam-ayurveda.org

RECENT DEVELOPMENTS

WHO Collaborative Centre for Traditional Medicine (Ayurveda)[45]

In India, there are around 30 Collaborative Centres for WHO from different disciplines of modern and allied sciences, but it is noteworthy to emphasize that, IPGT & RA is the only Ayurvedic centre throughout the world (out of 22 for traditional systems), which is designated as collaborative centre for Ayurveda.

The below are the terms of references (TOR) that are to be focussed during the period of collaboration.

TOR - 1: Rationalization and Standardization of Health Promotion Guidelines of Ayurveda

TOR- 2: Development of Standard Ayurveda Treatment Protocols for Lifestyle Disorders.

TOR - 3: Organization of Orientation Training Programmes for Foreign and National Medical Professionals and WHO Fellows & Officials on Scientific Aspects and Evidence-based uses of Ayurveda.

TOR - 4: Development of a Base Paper for Regional Consultation on Enhancing Communication between Traditional Medicine Practitioners and Modern Medicine Practitioners.

TOR - 5: Development of Strategic Measures and Capacity Building Programme for Strengthening of Pharmacovigilance of Traditional Medicines.

National AYUSH Mission (NAM)[46]

Govt. of India recently launched the National AYUSH Mission (NAM) with its core and flexible components. The proposed Mission will address the gaps in health services through supporting the efforts of State/Union Terratory Governments for providing AYUSH health services/education in the country, particularly in vulnerable and far-flung areas. Under NAM special focus will be given for specific needs of such areas and for allocation of higher resources in their Annual Plans. The Mission will help in:

1. The improvement of AYUSH education through enhancement in the number of upgraded educational institutions;

2. Better access to AYUSH services through increase in number of AYUSH hospitals and dispensaries, availability of drugs and manpower;

3. Providing sustained availability of quality raw material for AYUSH systems of medicine;

4. Improving availability of quality Ayurvedic, Siddha, Unani and Homeopathy (ASU&H) drugs through increase in number of pharmacies, drug laboratories and improved enforcement mechanism of ASU&H drugs.

National Health Policy 2015 – Realizing the Potential of AYUSH services[47]

The National Policy on Indian Systems of Medicine and Homeopathy adopted in 2002, called for a meaningful, phased integration of ISM with health delivery systems which was taken forward both by the AYUSH Department and as part of the mainstreaming component of AYUSH under the National Rural Health Mission.

In addition, there is need to recognize the contribution of the large private sector and no-for profit organizations providing AYUSH services, conducting research for growth of the knowledge base of the AYUSH systems and their services. The contribution of several organizations across the country is also visible in documenting; validating and promoting home and community based traditional practices and practitioners, especially providing recognition to the special knowledge held by various caste groups and advisees, thereby empowering the marginalized groups. A third development in the past decade globally, has been the emergence of integrative

medicine as a frontier and India has the potential to become a world leader in this sphere, given adequate support for research and institution building large part of the population uses AYUSH remedies and prefers to do so, choosing this for reasons that include perceived lower side effects, costs and/or considerations of it being more natural. The first and most important consideration in public policy with respect to AYUSH is ensuring that persons who so choose have access to these remedies. The strategy of collocation in public facilities providing allopathic care as well will continue.

Another strategy is investing more on making AYUSH drugs available and standardizing drugs and treatment protocols. A third is good propagation of the potential of AYUSH remedies in a number of conditions. Further disciplines like Yoga would be introduced much more widely in the school and in work places as part of promotion of good health.

The second important meaning of mainstreaming, which was accelerated with NRHM, was training of AYUSH professionals to help them perform National Program functions. In many primary health centre's however they are the only medical professionals available and therefore take care of both AYUSH and allopathic curative care.

This policy further support the integration of AYUSH systems at the level of knowledge systems by validating processes of health care promotion and cure and sensitizing practitioners of each system (Allopathic and AYUSH) to the strengths of the others. Such validation would lead to greater acceptability and even use of AYUSH remedies by all practitioners-and there is potential for such use in NCDs care and geriatric care and promotive health. This is also needed for integration across the different streams within AYUSH and for cross-referrals as appropriate across systems.

This is also required for systemic validation evidence pertaining to safety, efficacy and quality of AYUSH drugs and therapies. Promotion of further research in this field will be actively pursued, and application of available integrative knowledge through development of appropriate clinical protocols for primary, secondary and tertiary levels will be part of this approach.

The policy recognizes the need to standardize and validate Ayurveda medicines. To better regulate the AYUSH drugs market the policy would also support establishment of separate Central Drug Controller for AYUSH drugs and strengthening of quality enforcement mechanism in the States for application to mass manufactured drugs. The policy would also strengthen steps for farming of herbal plants.

(Note-This Draft placed in public domain for comments, suggestions, feedback by Ministry of Health & Family welfare in December 2014)

CONCLUSION

Today with the growing popularity of Ayurveda worldwide, the approach towards information, education and communication (IEC) of Ayurveda needs a paradigm shift. The present paper cites various scattered information and data which are available on the internet, journals, bulletins, manuals, brochures, annual reports, results framework documents, health research policies and other various literature are compiled and presented for the benefit of global generation in the form of this review article.

ABBREVIATIONS

ADR	:	Adverse Drug Reaction
AFI	:	Ayurvedic Formulary of India
AIIA	:	All India Institute of Ayurveda
API	:	Ayurvedic Pharmacopoiea of India
ASHA	:	Accredited Social Health Activist
ASU	:	Ayurveda, Siddha, Unani
AYUSH	:	Ayurveda, Yoga & Naturopathy, Unani, Siddha & Sowarigpa and Homeopathy
BHU	:	Banaras Hindu University
CCIM	:	Central Council for Indian Medicine
CCRAS	:	Central Council For Research in Ayurvedic Sciences
CCRIMH	:	Central Council for Research in Indian Medicine & Homeopathy
C-DAC	:	Centre for Development of Advanced Computing
CDSCO	:	Central Drug Standards Control Organization
CME	:	Continuing Medical Education
CSS	:	Centrally Sponsored Scheme
DBT	:	Department of Bio-Technology
DISR	:	Department of Industry, Science & Resources
DHARA	:	Digital Helpline for Ayurveda Research Articles
DMP	:	Doctors Meet Programme
DRDO	:	Defense Research & Development Organization
DST	:	Department of Science & Technology
DSIR	:	Department of Scientific and Industrial Research
EMR	:	Extra-Mural Research
FICCI	:	Federation of Indian Chambers of Commerce and Industry
GMP	:	Good Manufacturing Practice
GTP	:	Golden Triangle Research Partnership
ICAR	:	Indian Council for Agricultural Research
ICDSS	:	Integrated Clinical Decision Support System
ICMR	:	Indian Council of Medical Research
ICT	:	Information & Communication Technology
IEC	:	Information, Education & Communication
IMPCL	:	Indian Medicine Pharmaceutical Corporation Limited

IMR	:	Intra Mural Research
IPGT&RA	:	Institute of Post-Graduate Teaching & Research in Ayurveda
IPR	:	Intellectual Property Rights
ISM&H	:	Indian Systems of Medicine & Homeopathy
MoH&FW	:	Ministry of Health & Family Welfare
NCD	:	Non Communicable Diseases
NIA	:	National Institute of Ayurveda
NAM	:	National AYUSH Mission
NIIMH	:	National Institute of Indian Medical Heritage
NMPB	:	National Medicinal Plant Board
NRHM	:	National Rural Health Mission
PLIM	:	Pharmacopoeial Laboratory for Indian Medicine
RAV	:	Rashtriya Ayurved Vidhyapeeth
RCH	:	Reproductive & Child Health
ROTP	:	Re-Orientation Training Programme
TKDL	:	Traditional Knowledge Digital Library
WHO	:	World Health Organization

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