



# AYURVEDA

## The Science of Life



**Department of AYUSH  
Ministry of Health & Family Welfare  
Government of India  
New Delhi  
[www.indianmedicine.nic.in](http://www.indianmedicine.nic.in)**



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**अनिल कुमार**  
ANIL KUMAR

गवर्नर  
श्रीमति नरेश राजपाल  
आयुर्वेद, योग व शाक्तिक चिकित्सा  
यूनानी सिद्ध एवं होमोयोथेरेपी (आयुष) विभाग  
स्वास्थ्य एवं परिवार कल्याण मंत्रालय  
रेड क्रॉस भवन, नई दिल्ली-110001

**SECRETARY**  
**GOVERNMENT OF INDIA**  
**DEPARTMENT OF AYURVEDA, YOGA & NATUROPATHY**  
**UNANI, SIDDHA AND HOMOEOPATHY (AYUSH)**  
**MINISTRY OF HEALTH & FAMILY WELFARE**  
**RED CROSS BUILDING, NEW DELHI - 110001**  
Tel : 011-23715564 Telefax : 011-23327880  
e-mail : [seyt-ayush@nic.in](mailto:seyt-ayush@nic.in)  
Mailing No. 110 108

## FOREWORD

The roots of the Indian traditional systems of medicine can be traced back to approximately 5000 BC. These systems of medicine alongwith other systems come under the jurisdiction of the Department of AYUSH, Ministry of Health & Family Welfare, Government of India, and include Ayurveda, Yoga & Naturopathy, Unani, Siddha, Sowa Rigpa, and Homoeopathy. Besides their traditional usage through centuries, Indian traditional systems of medicine have been officially recognized and practiced for many decades throughout India in public, private and voluntary organizations. In fact, India is one of the few countries in the world to have formulated, much earlier than others, specific policies for AYUSH systems, and for integrating the use of these systems in the public health care delivery system.

AYUSH systems have a distinct identity and capability to manage health problems through a holistic approach. Validation studies have proven the inherent strengths of AYUSH in disease prevention and health promotion, as well as in dealing with lifestyle related non-communicable diseases, metabolic disorders etc. With the comprehensive support of the Government of India, AYUSH systems have continued to grow and develop over the years, thus increasingly catering to the health needs of the country. Steps continue to be taken for mainstreaming of these systems to effectively address India's contemporary and emerging health challenges.

In the first ever such exercise by the Department of AYUSH, steps have been taken to bring out a series of publications with a view to present a snapshot of the scientific aspects and the relevance of AYUSH in the contemporary and emerging health scenario. The Department of AYUSH is pleased to present this publication on 'Ayurveda - the Science of Life'. This publication is a culmination of a consultative process involving numerous experts and peers in the field. This publication is the first in the series of similar publications planned for the other systems of medicine, with the common objective of spreading the rich and age-old medical knowledge for universal health benefits. The Department of AYUSH appreciates the commitment and efforts of all those involved in bringing out this document. These efforts would be well rewarded if the document is used extensively by policy makers and concerned stakeholders.



(Anil Kumar)



## PREFACE

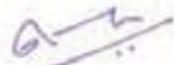
India has a long history and strong base of Ayurveda which is gaining the attention of international community. The health promotive, disease preventive and curative roles of Ayurveda with its holistic approach are the reasons for its acceptance. Based on sound concept and practices, Ayurvedic System of Medicine is well documented and includes every aspect of health and disease. In spite of advances in biomedical research, many new diseases are emerging. Prevention and management of chronic and non-communicable diseases pose a global challenge to the medical fraternity and scientists. To address emerging challenges of healthcare, there is a need for functional integration of Ayurveda and conventional medicine with its affordable and evidence based use.

A need was felt to publish a document containing all important aspects of Ayurveda and its development. The document is developed keeping in view the needs of large sections of readers such as medical professionals, academicians, researchers, policy makers, students as well as general public who wish to know important aspects of Ayurveda – a distinct healthcare system.

The information given in this book is widely sourced from published documents. The document contains information on Ayurveda covering historical evolution, fundamental concepts, lifestyle management, important therapeutic approaches, research & development, education & practice. The readers may appreciate the ‘contemporary scientific evidence’ generated on fundamentals and pharmaco-therapeutics of Ayurveda given in the document. Keeping in view the scope and readership of the document, only the outline of information about Ayurveda without losing key elements has been presented. Thus, the document is published with the sole intention of providing concise information about Ayurveda.

I am extremely grateful to Mr. Anil Kumar, Secretary, Department of AYUSH, Ministry of Health and Family Welfare, Government of India who had conceived the idea of bringing out this publication ‘Ayurveda – The science of life’ encompassing all concepts and essential elements in abridged form. I am also grateful to Mr. Bala Prasad, Joint Secretary (AYUSH), for his constant encouragement, support and inputs in developing this document.

I appreciate the efforts put in by all the experts and my colleagues in the Council in developing this document. I also wish to place on record my appreciation for the efforts put in by the editors, expert reviewers and contributors in bringing out this document with precise and lucid information. I sincerely hope the readers would find this document useful. The readers who wish to know more details may go through sources given at the end of each chapter and in ‘suggestive reading’. I will greatly appreciate the suggestions from the readers for its improvement in future editions.



**(Dr. D. Ramesh Babu)**  
Director General  
Central Council for Research in Ayurvedic Sciences  
New Delhi  
E-mail: dg-ccras@nic.in

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**Guidance and Facilitation:** Mr. Bala Prasad, Joint Secretary, Department of AYUSH, Ministry of Health and Family Welfare, Government of India, New Delhi.

**Editors:** Dr. Ramesh Babu, Director General, Central Council for Research in Ayurvedic Sciences, New Delhi; Dr. D.C. Katoch, Joint Advisor (Ayurveda), Department of AYUSH, Ministry of Health and Family Welfare, Government of India, New Delhi; Dr. M.M.Padhi, Deputy Director (Technical); Central Council for Research in Ayurvedic Sciences, New Delhi.

**Experts for Technical Review:** Prof. R.H. Singh, Distinguished Professor, Faculty of Ayurveda, Institute of Medical Sciences, Banaras Hindu University, Varanasi; Prof. M.S. Baghel, Director, Institute of Post Graduate Teaching and Research in Ayurveda, Gujarat Ayurved University, Jamnagar; Prof. Ajay Kumar Sharma, Director, National Institute of Ayurveda, Jaipur; Prof. Manoranjan Sahu, Faculty of Ayurveda, Institute of Medical Sciences, Banaras Hindu University, Varanasi; Prof. S.S. Savrikar, R.A. Poddar Ayurvedic College, Mumbai; Dr. Vasudevan Namboothiri, Former Director, Ayurveda Medical Education, Government of Kerala, Thiruvananthapuram; Prof. Abhimanyu Kumar, National Institute of Ayurveda, Jaipur; Dr. P. Murali Krishna, Professor, S.V. Ayurvedic College, Tirupati; Dr. Sanjeev Rastogi, Reader, State Ayurveda College, Lucknow.

**Contributors :** Dr. N. Srikanth, Assistant Director (Ayurveda); Dr. Sulochana Bhat, Research Officer (Scientist-3); Dr. Vinod Kumar Lavaniya, Research Officer (Ayurveda); Dr. Babita Yadav, Research Officer (Ayurveda); Dr. B.S. Sharma, Research Officer (Scientist-2); Dr. Renu Singh, Research Officer (Ayurveda) Central Council for Research in Ayurvedic Sciences, Department of AYUSH, Ministry of Health and Family Welfare, Government of India, New Delhi.

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## CONTENTS

<b>FOREWORD</b>	<b>III</b>
<b>PREFACE</b>	<b>V</b>
<b>ACKNOWLEDGEMENT</b>	<b>VII</b>
<b>CONTENTS</b>	<b>IX</b>
<b>ABBREVIATIONS</b>	<b>XI</b>
<b>INDO-ROMANIC EQUIVALENTS FOR SANSKRIT (DEVANĀGARĪ) ALPHABETS</b>	<b>XIII</b>
<b>EXECUTIVE SUMMARY</b>	<b>XV</b>
<b>LIST OF FIGURES</b>	<b>XXI</b>
<b>Chapter 1: INTRODUCTION</b>	<b>01-23</b>
1.1 Historical Evolution	01
1.2 Major Milestones	05
1.3 Infrastructure and Network	08
1.4 Global Scenario	12
1.5 Strength of Ayurveda	18
1.6 Organization of the Document	21
<b>Chapter 2: FUNDAMENTAL CONCEPTS</b>	<b>24-35</b>
2.1 Basic Principles	24
2.2 Disease Process	31
2.3 Diagnostics and Therapeutic Management	31
<b>Chapter 3: LIFESTYLE MANAGEMENT</b>	<b>36-45</b>
3.1 Food	36
3.2 Lifestyle	38
<b>Chapter 4: DRUGS</b>	<b>46-54</b>
4.1 Principles of Drug Action	46
4.2 Pharmaceutics	47
4.3 Drug Manufacture	49
4.4 Standardization and Quality Control	50

<b>Chapter 5: IMPORTANT THERAPEUTIC APPROACHES .</b>	<b>55-62</b>
5.1 Pañcakarma	55
5.2 Kṣārasūtra	61
5.3 Rasāyana	62
<b>Chapter 6: RESEARCH AND DEVELOPMENT</b>	<b>63-95</b>
6.1 Central Council for Research in Ayurvedic Sciences	64
6.2 Important Research Outcomes	71
6.3 Commonly used Medicinal Plants	82
<b>Chapter 7: EDUCATION AND PRACTICE</b>	<b>96-102</b>
7.1 Education	96
7.2 Ayurvedic Medical Practice	99
<b>SUGGESTIVE READING</b>	<b>103-108</b>
Books and Monographs	103
Important Journals	107
Important Websites	108
<b>GLOSSARY</b>	<b>110-115</b>

## **ABBREVIATIONS**

ADR	-	Adverse Drug Reaction
AFI	-	Ayurvedic Formulary of India
AIIA	-	All India Institute of Ayurveda
APC	-	Ayurvedic Pharmacopoeia Committee
API	-	Ayurvedic Pharmacopoeia of India
ASU	-	Ayurveda, Siddha and Unani
AYUSH	-	Ayurveda, Yoga & Naturopathy, Unani, Siddha and Homoeopathy
CCIM	-	Central Council of Indian Medicine
CCRAS	-	Central Council for Research in Ayurvedic Sciences
CDRS	-	Composite Drug Research Scheme
CIMAP	-	Central Institute of Medicinal and Aromatic Plants
CME	-	Continuing Medical Education
CNS	-	Central Nervous System
CSIR	-	Council of Scientific and Industrial Research
EPO	-	European Patent Office
FH	-	Faith Healer
FoH	-	Folk Healer
GOI	-	Government of India
ICCR	-	Indian Council for Cultural Relations
ICMR	-	Indian Council of Medical Research
IEC	-	Information, Education and Communication
IGC	-	Inter Governmental Committee
IIFT	-	Indian Institute of Foreign Trade
IPGT& RA	-	Institute of Post Graduate Teaching and Research in Ayurveda
ISM & H	-	Indian Systems of Medicine and Homoeopathy
JRAS	-	Journal of Research in Ayurveda and Siddha
MSR	-	Minimum Standard Requirements

NABH	- National Accreditation Board for Hospitals & Health Care
NABL	- National Accreditation Board for Laboratories
NEIAH	- North Eastern Institute of Ayurveda and Homoeopathy
NIA	- National Institute of Ayurveda
NIIMH	- National Institute of Indian Medical Heritage
NMPB	- National Medicinal Plants Board
NPRC-ASU	- National Pharmaco-vigilance Resource Centre for Ayurveda, Siddha, Unani
NPTAC-ASU	- National Pharmaco-vigilance Technical Advisory Committee for Ayurveda, Siddha, Unani
NRHM	- National Rural Health Mission
PCIM	- Pharmacopoeia Commission of Indian Medicine
PLIM	- Pharmacopoeial Laboratory of Indian Medicine
QCI	- Quality Council of India
QOL	- Quality of Life
RAV	- Rashtriya Ayurved Vidyapeeth
RCH	- Reproductive & Child Health
THP	- Traditional Health Practitioner
TKDL	- Traditional Knowledge Digital Library
UKPTO	- United Kingdom Trademark & Patent Office
USPTO	- United States Patent and Trademark Office
WHO	- World Health Organization

## INDO-ROMANIC EQUIVALENTS FOR SANSKRIT (DEVANĀGARĪ) ALPHABETS

अ	A	a	ठ	THA	tha
आ	Ā	ā	ड	DA	da
इ	I	i	ढ	DHA	dha
ई	Ī	ī	ण	NA	na
उ	U	u	त	TA	ta
ऊ	Ū	ū	थ	THA	tha
ऋ	R̥	r̥	द	DA	da
ए	E	e	ध	DHA	dha
ऐ	AI	ai	न	NA	na
ओ	O	o	प	PA	pa
औ	AU	au	फ	PHA	pha
ः	M̥	m̥	ब	BA	ba
ঁ	Ṅ	ṁ	ভ	BHA	bha
ঃ	H̥	h̥	ম	MA	ma
କ	KA	ka	য	YA	ya
ଖ	KHA	kha	ର	RA	ra
ଗ	GA	ga	ଲ	LA	la
ଘ	GHA	gha	ବ	VA	va
ଙ୍ଗ	ṄA	ṅa	ଶ	ŚA	śa
ଚ	CA	ca	ଷ	ṢA	ṣa
ଛ	CHA	cha	ସ	SA	sa
ଜ	JA	ja	ହ	HA	ha
ଝ	JHA	jha	କ୍ଷ	KṢA	kṣa
ତ୍ର	ṄA	ṅa	ତ୍ର	TRA	tra
ଟ	ṬA	ṭa	ଜ୍ଞ	JṄA	jñā



## EXECUTIVE SUMMARY

Ayurveda is a comprehensive scientific system of medicine evolved in India. Initially it was developed through ancient wisdom, clinical experiences and experimentation in scientific manner. At present, Ayurveda is growing in the paradigm of contemporary scientific, technological and medical parameters.

The term ‘Ayurveda’ meaning ‘the knowledge of life’ comprises of two Sanskrit words *viz.* ‘Āyu’ meaning ‘Life’ and ‘Veda’ meaning ‘Knowledge’ or ‘Science’. The earliest concepts of medical science are found in the ancient wisdom called *Veda*, which were believed to be composed between 5000 - 1000 BC. The classical texts of Ayurveda containing exclusive information on health and disease came around 1000 B.C. onwards, when fundamental and applied principles of Ayurveda were codified in a systematic manner. The basic tenets of Ayurveda are elaborated in two great medical compendia *viz.* *Caraka Samhitā* and *Suśruta Samhitā*. Since its advent, Ayurveda passed through different political and socio cultural phases and stood test of time, got enriched by the contribution of different practitioners and scholars and catered the health needs of contemporary societies. Present form of Ayurveda is the outcome of continued scientific inputs that have gone into the evolution of its principles, theories and guidelines of healthy living and disease management.

At present, Ayurveda has become integral part of national health delivery system of India. Ayurveda institutions for research and education, hospitals and dispensaries were established in different parts of the country. The government had initiated measures to regulate the system. In 1971, Central Council of Indian Medicine (CCIM) was set up as statutory body to regulate education and practice. For undertaking integrated and coordinated research, Composite Drug Research Scheme (CDRS) was initiated in 1964. In 1970, Central Council for Research in Indian Medicine & Homoeopathy (CCRIMH) was established for giving focused attention towards research. A separate Department of Indian Systems of Medicine and Homoeopathy (ISM&H) under the Ministry of Health & Family Welfare, Government of India was created in 1995 for developing Ayurveda, Yoga & Naturopathy, Unani, Siddha and Homoeopathy systems. This department was renamed as Department of Ayurveda, Yoga & Naturopathy, Unani, Siddha and Homoeopathy (AYUSH) in 2003. Research activities in Ayurveda have increased manifold with establishment of separate and autonomous research council *viz.* Central Council for Research in Ayurvedic Sciences (CCRAS).

Education, clinical practice, manufacturing and sale of Ayurvedic medicines are regulated in the country through Acts, Rules and Regulations. Infrastructure development in private and public sectors has improved the outreach of Ayurveda to the community in a commendable way. Global resurgence of demand for natural medicine has filliped R&D activities in

Ayurveda at national and international levels with inter-disciplinary collaboration and linkages.

Government of India has enunciated “National Policy on Indian Systems of Medicine & Homoeopathy - 2002”. The policy *inter alia* includes the strategy for comprehensive development of Ayurveda in contemporary perspective.

The Department of AYUSH has supported several international conferences/seminars/workshops/trade fairs in collaboration with Indian Missions, Universities, Associations and other agencies promoting traditional systems of medicine overseas. AYUSH experts are frequently deputed as resource persons to such events and also for facilitating Continuing Medical Education (CME) and training programs on AYUSH systems in foreign universities. Chairs on Ayurveda are being set up in the Universities in Germany and South Africa. Under the Department's International Cooperation scheme the department of AYUSH has set up an AYUSH information cell in the premises of the Indian cultural centre in Malaysia with the support of Indian High Commission in Kuala Lumpur, Malaysia. India is a prominent member in the Inter-governmental Committee (IGC) on Traditional Knowledge, Genetic Resources and Folklore.

Good health is a basic prerequisite to acquire materialistic, social and spiritual upliftment of individual. Therefore Ayurveda lays great emphasis on preservation and promotion of health and prevention of disease. This is achieved through life style management rather than drug or any other external intervention. According to Ayurveda, the living human body is a composition of the body matrix, *Indriya* (sensory and motor organs), *Manas* (mind) and *Ātmā* (soul). Ayurveda advocates a holistic approach while understanding healthy and diseased states of the human body, and their management. In this respect the human body is considered a microcosm representing the Universe, a macrocosm. The universe as well as the human body is made up of ‘*Pañcamahābhūta*’, the five basic elements viz. ‘*Prthvī*’, the basic earthy/gross element, ‘*Jala*’, the basic aqueous element, ‘*Agni*’, the basic thermal element, ‘*Vāyu*’, the basic gaseous element and ‘*Ākāśa*’, the basic ethereal element. Similarly the Moon, Sun and Wind in the Universe are represented in the human body respectively by three ‘*Dosa*’ (regulatory and functional entities of the body) viz. ‘*Kapha*’, ‘*Pitta*’ and ‘*Vāyu*’. These ‘*Dosa*’ are regulatory and functional entities of the body. Any function in the body is grossly attributed to one of the three ‘*Dosa*’.

The structural entities in the body are classified as ‘*Dhātu*’. They are seven in number and are responsible for maintaining the body in a compact and composed state. The seven ‘*Dhātu*’ are i. ‘*Rasa*’ (nutrient fluids), ii. ‘*Rakta*’ (blood), iii. ‘*Māmsa*’ (muscle tissue), iv.

‘*Meda*’ (adipose tissue), v. ‘*Asthi*’ (bone tissue), vi. ‘*Majjā*’ (bone marrow) and vii. ‘*Sukra*’ (reproductive tissue).

The structural and functional elements of the body are accompanied by excretory entities, classified as ‘*Mala*’. ‘*Mala*’ are grossly divided into three *viz.* ‘*Mūtra*’, the urine, ‘*Purīsa*’, the faeces and ‘*Sveda*’, the sweat. The excretions from eyes, ear etc. are also categorized as ‘*Mala*’.

Apart from ‘*Dosha*’, ‘*Dhātu*’ and ‘*Mala*’ the living body harbors an independent mechanism of digestion and metabolism. The digestion and metabolism is function of ‘*Agni*’, which is a composite mechanism in various parts of the body. Ayurveda defines health as a state of equilibrium of ‘*Dosha*’, ‘*Dhātu*’, ‘*Mala*’ and ‘*Agni*’. Loss of this equilibrium invariably results into manifestation of disease.

Every individual has a unique ‘*Prakṛti*’ (psychosomatic constitution) which is responsible for the structural and functional attributes of body and mind, health or disease patterns of an individual. The basic constitution of a person is determined at the time of conception. Ayurvedic concept of examination of ‘*Prakṛti*’ is a key determinant for prescribing individualized diet, lifestyle or treatment regimen.

The disease management in Ayurveda is considered under two major heads 1. *Nidāna* (diagnosis) and 2. *Cikitsā* (treatment). Ayurvedic method of diagnosis involves *Rogī Parīkṣā* (clinical examination) as well as the *Roga Parīkṣā* (diagnosis of disease). The diagnosis is principally based on evaluating the status of ‘*Dosha*’, ‘*Dhātu*’, ‘*Mala*’ and ‘*Agni*’, whereas treatment modules are designed principally with an object of restoring their equilibrium. The Ayurvedic treatment methods can be grossly divided into three methods ‘*Samśodhana*’ (bio-cleansing therapy), ‘*Samśamana*’ (palliative therapy) and ‘*Nidāna Parivarjana*’ (avoidance of causative factors). ‘*Samśodhana*’ is practiced through one or more therapies from ‘*Panchakarma*’, whereas ‘*Samśamana*’ is achieved through ‘*Āhāra*’ (food), ‘*Vihāra*’ (lifestyle) and ‘*Dravya*’ (drug).

Ayurveda believes that no substance in the Universe is devoid of therapeutic potential, provided it is used judiciously. Plants, Minerals, Metals and Animal products serve as a basic source of Ayurvedic drugs. Drugs prepared from plants are known as ‘*Kāṣṭhauṣadhi*’ whereas mineral and metal drugs are known as ‘*Rasausadhi*’. Animal products are not frequently used as independent drugs; however they are used as a medium or vehicle in preparation or administration of plant and mineral/metal drugs. The regimens are customized

by the practitioner depending upon the specific requirements in accordance with the basic ‘*Prakṛti*’, and health status of ‘the individual.

Ayurvedic pharmaceutical science can be broadly considered under two major heads 1. ‘*Dravya Guna*’ (Ayurvedic pharmacology) and 2. ‘*Bhaisajya Kalpanā*’ (Ayurvedic pharmaceutics). Plant drugs are used in different dosage forms in accordance with subject specific requirement. The basic dosage forms of plant drugs are known as ‘*Pañcavidha Kasāya Kalpanā*’ (five dosage forms). They are ‘*Svarasa*’ (expressed juice), ‘*Kalka*’ (paste), ‘*Kvātha*’ (decoction), ‘*Phānta*’ (hot infusion) and ‘*Hima*’ (cold infusion). Many more dosage forms such as ‘*Cūrṇa*’ (powder), ‘*Vati*’ (pill), *Āsava- Arista* (medicated fermented preparations), ‘*Lehya*’ (linctus), aqueous extracts etc. derived with modern technology are also in practice. The methods of preparation of these dosage forms are fairly simple, because of which the Ayurvedic practitioners prefer to prepare the required drugs on their own. However preparation of ‘*Rasausadhi*’ (mineral and metal drugs) is a complicated procedure. Minerals and metals are generally known to be potentially harmful to the human body if not processed properly. These minerals and metals are subjected to complex and meticulous processing to make them therapeutically useful and safe to the body in prescribed doses. The final product of mineral/metal drugs made with incineration generally known as ‘*Bhasma*’ (calcined material) and others as ‘*Rasausadhi*’.

Ayurvedic drugs are being manufactured on large scale by approximately 8000 Ayurvedic drug manufacturing units spread all over the country. According to Drugs and Cosmetics Act 1940, Ayurvedic drugs are classified into two categories - i. Classical or generic drug formulations manufactured exclusively in accordance with the formulae described in the specified authoritative books of Ayurveda and ii. Patent and Proprietary drug formulations developed by the manufacturer. The demand for medicinal plants has increased manifold due to upsurge in domestic Ayurvedic drug industry and global interest in herbal products. The Government of India has set up National Medicinal Plants Board with the object to promote cultivation and propagation of medicinal plants and also to ensure sustained supply of quality plant material to Ayurvedic drug industry.

Manufacturing, sale and distribution of Ayurvedic drugs are regulated through Drugs and Cosmetic Act 1940 and Drugs and Cosmetics Rules 1945. The Government of India has set up the Ayurvedic Pharmacopoeia Committee (APC) to prescribe standards of single drugs and compound formulations mentioned in Ayurveda for the use of manufacturers. Moreover Good Manufacturing Practices (GMP) under Schedule ‘T’ of the Drugs and Cosmetics Act 1940, have also been notified to ensure the quality of ASU (Ayurveda, Siddha, Unani) medicines. Reference quality standards of drugs are published in Ayurvedic Pharmacopeia to

ensure that the manufacturing of drugs is done accordingly using authentic raw materials of prescribed quality free from contamination and impurities.

Presently, India has a well knit network of Ayurvedic education. There are more than 250 Ayurvedic institutions conducting graduate, post graduate courses and Ph.D. programmes. More than 400,000 registered practitioners of Ayurveda are practicing in India. Ayurvedic education and practice is regulated by a statutory body Central Council of Indian Medicine, which is established under the Indian Medicine Central Council Act 1970.

The courses of Ayurveda studies conducted in India are:

- i. Bachelor of Ayurvedic Medicine and Surgery (BAMS) - 5½ years (including one year internship) under graduate (UG) Course
- ii. MD (Ayurveda)/MS (Ayurveda) - 3 years post graduate (PG) course in various specializations.
- iii. Ph.D. (Ayurveda) - Research Degree program of minimum 2 years duration.
- iv. PG Diploma courses in Ayurveda - PG Diploma courses of two years duration.
- v. Specialized Degrees – Courses in Pharmacy and medicinal plants such as M. Sc. (Med. Plants in Ayurveda), Ph.D. (Med. Plants), D. Pharma. (Ayurveda), B. Pharma. (Ayurveda) and M. Pharma. (Ayurveda).
- vi. Opportunities for International scholars: Government of India imparts scholarships to international scholars recommended through Indian Embassies for taking up formal Ayurveda studies in Indian Institutions. Department of AYUSH has reserved some seats in premier institutions for the admission of International scholars. Gujarat Ayurveda University, Jamnagar through International Centre for Ayurvedic Studies runs exclusive BAMS course in English medium for foreigners. In addition, short term courses are also devised and conducted for persons having graduation in Ayurveda/traditional medicines, foreign modern medical degree or qualification in allied subjects.

The practice in this system is being regulated through IMCC Act 1970 and the register of trained practitioners is maintained by the Central or State Boards. Professionals with medical qualifications granted by Universities, in or outside India which are recognized by CCIM are allowed to register and practice in India.

As on 2011 there were 429246 registered Ayurveda practitioners, 2420 Ayurveda hospitals and 15017 dispensaries. The medicines are dispensed in either dispensaries attached to the clinic or the hospital by the outside pharmacies through the prescriptions. Ayurvedic procedures like *Pañcakarma* and *Kṣarasūtra* are also practiced through the specialty centers established at different levels.

Presently the research in Ayurveda is conducted through multi-disciplinary approach. The drug development phase includes selection of research area on the basis of national priority and literatures, growing and collection of authentic raw materials by using good practices, standardization, safety/ toxicity studies, targeted biological activities and phased clinical trials. At each stage, the research proposal has to undergo a scrutiny of scientific and monitoring committees, which includes experts from Ayurveda, Allopathy, Biostatistics and Pharmacology etc. Besides the infrastructure under the Department of AYUSH the research in this sector is being undertaken by Indian Council of Medical Research (ICMR), Council of Scientific and Industrial Research (CSIR), Department of Science and Technology, Department of Biotechnology, various Universities, medical colleges, AYUSH colleges, Non Government Organisations (NGOs), hospitals, pharmaceutical industry etc.

To strengthen this sector, the Government of India has taken initiatives to address the basic needs of health care delivery by mainstreaming AYUSH through improving quality, safety, efficacy and accessibility of Ayurvedic drugs. The Department of AYUSH has identified areas for research on the basis of national priority and by considering the strength of Ayurveda.

The Central Council for Research in Ayurvedic Sciences is an apex body set up by the Government of India for formulation, coordination, development and promotion of research in Ayurveda on scientific lines. Its activities on literary research, drug research, clinical research and other related activities are carried out by adopting standard guidelines and parameters, through its 30 peripheral institutes across the country and also in collaboration with premier institutions.

## LIST OF FIGURES

<b>Fig. No.</b>	<b>Details</b>	<b>Page</b>
1.	Ancient Indian Surgeon - Suśruta	04
2.	Signing of a Memorandum of Understanding between Central Council for Research in Ayurvedic Sciences and Durban University of Technology, South Africa for establishing Ayurveda Chair at Durban University of Technology, Durban, South Africa on 17th September 2011	14
3.	Signing a Memorandum of Understanding between Central Council for Research in Ayurvedic Sciences, Department of AYUSH, Ministry of Health & Family Welfare, Government of Republic of India and the University of West Indies in presence of Dr. Manmohan Singh, Hon'ble Prime Minister of India and Mrs. Kamla Persad Bissessar, Prime Minister of the Republic of Trinidad and Tobago at New Delhi on January 06, 2012	15
4.	Mr. Anil Kumar, Secretary, Department of AYUSH, Ministry of Health & Family Welfare, Government of India presenting Ayurvedic Pharmacopoeia of India to Hon'ble Salinda Dissanayke, Health Minister, Ministry of Indigenous Medicine, Sri Lanka on 08.02.2012 at Colombo, Sri Lanka	16
5.	A view of TKDL Homepage	17
6.	Similarity between universe and human being	24
7.	Objectives of Ayurveda	24
8.	Pharmacognostical standards of <i>Bacopa monnieri</i>	51
9.	HPTLC of <i>Bacopa monnieri</i>	52
10.	<i>Patrapinda sveda</i>	59
11.	Central Council for Research in Ayurvedic Sciences	64
12.	View of Standardization and Quality Control Laboratory of ASU drugs	68
13.	Parameters for Standardization of Ayurvedic drugs	69
14.	View of instrumentation laboratory for quality control of Ayurvedic Drugs	69
15.	Pre-clinical safety studies of Ayurvedic drugs	70

16.	<i>Marica</i> ( <i>Piper nigrum</i> )	77
17.	<i>Citraka</i> ( <i>Plumbago zelanica</i> )	79
18.	<i>Arjuna</i> ( <i>Terminalia arjuna</i> W&A.)	82
19.	<i>Aśvagandhā</i> ( <i>Withania somnifera</i> Dumal)	82
20.	<i>Harītakī</i> ( <i>Terminalia chebula</i> Retz.)	83
21.	<i>Āmalakī</i> ( <i>Emblica officinalis</i> Gaertn.)	83
22.	<i>Ārdraka</i> ( <i>Zingiber officinale</i> Roxb.)	83
23.	<i>Guḍūcī</i> ( <i>Tinospora cordifolia</i> (Willd.) Miers.)	83
24.	<i>Śatāvarī</i> ( <i>Asparagus racemosus</i> Willd.)	84
25.	<i>Nimba</i> ( <i>Azadirachta indica</i> A.Juss)	84
26.	<i>Hingu</i> ( <i>Ferula foetida</i> Regel.)	84
27.	<i>Saptacakra</i> ( <i>Salacia oblonga</i> Wall.)	84
28.	<i>Śallakī</i> ( <i>Boswellia serrata</i> Roxb.ex Coleb.)	85
29.	<i>Śiriṣā</i> ( <i>Albizia lebbeck</i> Bent)	85
30.	<i>Kaṭukī</i> ( <i>Picrorhiza kurroa</i> Royle ex B enth.)	85
31.	<i>Tagara</i> ( <i>Valeriana wallichii</i> DC)	85
32.	<i>Vārāhīkanda</i> ( <i>Dioscorea bulbifera</i> Linn.)	86
33.	<i>Śaṅkhapuṣṭī</i> ( <i>Convolvulus pluricaulis</i> Choisy)	86
34.	<i>Varuṇa</i> ( <i>Crataeva nurvula</i> Buch-Ham.)	86
35.	<i>Dāruharidrā</i> ( <i>Berberis aristata</i> DC)	86
36.	<i>Kapikacchū</i> ( <i>Mucuna prurita</i> Hook.)	87
37.	<i>Bākuci</i> ( <i>Psoralea corylifolia</i> Linn.)	87
38.	<i>Kālamegha</i> ( <i>Andrographis paniculata</i> (Burm. f.) Wall. ex Nees)	87
39.	<i>Bhūmyāmalakī</i> ( <i>Phyllanthus amarus</i> Schum & Thonn.)	87
40.	<i>Brāhma</i> ( <i>Bacopa monnieri</i> ( Linn.) Wettst.)	88
41.	<i>Haridrā</i> ( <i>Curcuma longa</i> Linn.)	88
42.	<i>Śigru</i> ( <i>Moringa oleifera</i> Lam.)	88
43.	<i>Yaṣṭimadhu</i> ( <i>Glycyrrhiza glabra</i> Linn.)	88
44.	<i>Bilva</i> ( <i>Aegle marmelos</i> Corr.)	89
45.	<i>Maṇḍūkaparṇī</i> ( <i>Centella asiatica</i> (Linn) Urban.)	89

46.	<i>Mesaśrīṅgi</i> ( <i>Gymnema sylvestre</i> R.Br.)	89
47.	<i>Amlavetasa</i> ( <i>Hippophae rhamnoides</i> L.)	89
48.	<i>Āśoka</i> ( <i>Saraca asoca</i> (Rosc)DC Willd)	90
49.	<i>Kumārī</i> ( <i>Aloe barbadensis</i> Mill.)	90
50.	<i>Nirgundi</i> ( <i>Vitex negundo</i> Linn.)	90
51.	<i>Pārijāta</i> ( <i>Nyctanthes arbor-tristis</i> Linn.)	90
52.	<i>Erandā</i> ( <i>Ricinus communis</i> Linn.)	91
53.	<i>Methikā</i> ( <i>Trigonella foenum - graecum</i> Linn.)	91
54.	<i>Rasona</i> ( <i>Allium sativum</i> Linn.)	91
55.	<i>Kuṭaja</i> ( <i>Holarrhena antidysenterica</i> (Roth) A.DC)	91
56.	<i>Pippalī</i> ( <i>Piper longum</i> Linn.)	92
57.	<i>Vāsā</i> ( <i>Adhatoda vasica</i> Nees)	92
58.	<i>Punarnavā</i> ( <i>Boerhaavia diffusa</i> Linn.)	92
59.	<i>Tulasi</i> ( <i>Ocimum sanctum</i> Linn.)	92
60.	<i>Dādima</i> ( <i>Punica granatum</i> Linn.)	93
61.	<i>Kāravellaka</i> ( <i>Momordica charantia</i> Linn.)	93
62.	<i>Guggulu</i> ( <i>Commiphora wightii</i> (Arn.) Bhandari)	93
63.	Institute of Medical Sciences, Banaras Hindu University, Varanasi	96
64.	National Institute of Ayurveda, Jaipur, Rajasthan	97
65.	Institute of Post Graduate Teaching and Research in Ayurveda, Jamnagar, Gujarat	98
66.	AYUSH in public health	101



## Chapter 1

### INTRODUCTION

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#### 1.1 Historical Evolution

Ayurveda, the science of life is one of the ancient and comprehensive systems of health care. Quest for good health and long life is probably as old as human existence. According to Indian philosophy, health is prerequisite to pursue materialistic, social and spiritual upliftment of human being. It is believed that Lord Brahma the creator of the universe was also the first preacher of Ayurveda. Four *Vedas*, considered as oldest Indian literatures composed between 5000 and 1000 BC have information on treatment by plants and natural procedures. Reference of medicine and surgery are also found in Indian epics like *Rāmāyaṇa* and *Mahābhārata*. However, Ayurveda was established as a fully grown medical system from the period of *Samhitā* (compendium) i.e. around 1000 BC. The compendia like *Caraka Samhitā* and *Suśruta Samhitā* were written in a systematic manner with eight specialties during this period. In these treatises, the basic tenets and therapeutic techniques of Ayurveda got very much organized and enunciated. These treatises stressed the importance of maintenance of health and also expanded their vision to pharmaco-therapeutics. The therapeutic properties of plants, animal products and minerals were extensively described in these compendia, which has made Ayurveda a comprehensive system of health care.

There were two main schools of thoughts in Ayurveda; Punarvasu Ātreya - the school of physicians and Divodāsa Dhanvantari- the school of surgeons. Punarvasu Ātreya is mentioned as a pioneer in medicine, and Divodāsa Dhanvantari in surgery. Disciples belonging to each school immensely contributed in development of the traditions of their own school. Six pupils of Ātreya are believed to have composed their own compendia based on their *Guru's* teachings, but only two namely *Bhela Samhitā* in its original form and *Agniveśa tantra* redacted by Caraka and Dridhabala are available today. Considered to be the most ancient and authoritative writing on Ayurveda available today, *Caraka Samhitā* explains the logic and philosophy on which this system of medicine is based. Dhanvantari had six disciples and *Suśruta Samhitā*, a treatise primarily focusing on surgery was codified by Suśruta on the basis of teachings of Dhanvantari.

## Chapter 1: Introduction

The essential details of *Caraka Samhitā* and *Suśruta Samhitā* were compiled and further updated in the treatises *Aṣṭāṅga Saṅgraha* and *Aṣṭāṅga Hṛdaya* authored by Vṛddha Vāgbhaṭa and Vāgbhaṭa during 6<sup>th</sup> - 7<sup>th</sup> Century AD. Thus, the main three treatises called *Bṛhatṭrayī* i.e. *Caraka Samhitā*, *Suśruta Samhitā* and *Aṣṭāṅga Saṅgraha* formed basis for subsequent scholars to write texts and among them three concise classics i.e. *Mādhava Nidāna*, *Śāriṅgadhara Samhitā* and *Bhāva Prakāśa* having distinct features are called as *Laghutrayī*. Some other eminent practitioners and visionaries like Kāśyapa, Bhela, and Hārīta also wrote their respective compendia.

An analysis of Ayurvedic treatises signifies that the different aspects of Ayurveda were evolved and documented from time to time in the form of texts or compendia. For instance the *Caraka Samhitā* an authentic source of internal medicine emphasizes on philosophy of life and line of treatment for different diseases. *Suśruta Samhitā* added a complete systematic approach to surgery and diseases of eyes, ear, throat, nose, head and dentistry. *Mādhava Nidāna*, authored by Mādhavakara is a work on diagnosis of the diseases. *Bhāva Prakāśa* written by Bhāva Miśra gives additional emphasis on medicinal plants and Diet. *Śāriṅgadhara Samhitā* focused on pharmaceutics and Ayurveda was enriched with addition of more formulations and dosage forms. Subsequently, texts of Ayurveda were commented upon, updated and methodically written by many authors from time to time. A look into commentaries on the treatises by the scholars indicates that while the theoretical framework of Ayurveda remained more or less the same, the knowledge about drugs and techniques of therapy got expanded. The old concepts and descriptions were reviewed and updated in the light of contemporary understanding by the commentators in their commentaries thus reviving Ayurveda into an applied form. Present form of Ayurveda is the outcome of continued scientific inputs that has gone into the evolution of its principles, theories and practices.

During Buddhist period Jīvaka, a famous surgeon who treated Gautam Buddha studied Ayurveda at Takshashila University. Around 200 BC, medical students from different parts of the world used to come to the ancient University of Takshashila to learn Ayurveda. All the specialties of Ayurveda were developed and full-fledged surgery was practiced. From 200 to 700 AD, University of Nalanda also attracted foreign medical students mainly from Japan, China etc. Evidences show that Ayurveda had nurtured many medical systems of the world. The Egyptians learnt about Ayurveda long before the invasion of Alexander in 400 BC

through their sea-trade with India. Greeks and Romans came to know about it after their invasion. In the early part of the first millennium Ayurveda spread to the East through Buddhism and greatly influenced the Tibetan and Chinese system of medicine and herbology.

Around 800 AD, Nāgārjuna has conducted extensive studies on medicinal applications of mercury and other metals. These studies have entailed in the emergence of a new branch of Ayurveda viz. *Rasa Śāstra*. Rigorous procedures were developed to purify, detoxify and process formulations with metallic ingredients by using plant and animal materials. Classical treatises named *Rasaratnasamuccaya*, *Rasārnava*, *Rasa Hṛdaya Tantra* elaborating the manufacture of mineral and metallic drugs and their use in therapeutics were written during this period. Ayurveda, in later periods used Mercury as well as other metals as important components of pharmaceutical formulations. Many exotic and indigenous drugs for new uses found place in Ayurvedic literature. After 16<sup>th</sup> Century, there have been inclusions of diagnosis and treatment of new diseases on the basis of modern medical science.

In 1827, the first Ayurveda course was started in India in the Government Sanskrit College, Calcutta. By the beginning of 20<sup>th</sup> Century, many Ayurveda colleges were established in India under the patronage of provincial Rulers. Ayurveda gained more ground beginning from the 1970, as a gradual recognition of the value of Ayurveda revived. Lots of academic work was done during 20<sup>th</sup> century and many books were written and seminars and symposia were held.

In 1971, the Central Council of Indian Medicine (CCIM) was set up as statutory body by Indian Government to regulate education. An effort to carry out integrated and coordinated research was made for the first time in India by the Indian Council of Medical Research (ICMR) in 1964 through the Composite Drug Research Scheme (CDRS). In 1970, this scheme was transferred to the newly constituted Central Council for Research in Indian Medicine & Homeopathy (CCRIMH). Department of Indian Systems of Medicine and Homoeopathy (ISM&H) under the Ministry of Health and Family Welfare, Government of India was created in 1995 with a view to develop Education & Research in Ayurveda, Yoga & Naturopathy, Unani, Siddha and Homoeopathy systems. This was re-named as Department of Ayurveda, Yoga & Naturopathy, Unani, Siddha and Homoeopathy (AYUSH) in 2003. The Department continued to lay emphasis on upgradation of AYUSH educational standards, quality control and standardization of drugs, improving the availability of medicinal plant materials, research and development and awareness generation about the efficacy of the systems domestically and

internationally. Multidisciplinary collaborative research efforts in Ayurveda have increased manifold during the last couple of decades. Separate research councils have been formed for each Indian system of medicines.

Presently Ayurveda has well regulated undergraduate, post graduate and doctorate education in India. Commendable network of practitioners and manufactures exists. Infrastructure development in private and public sectors has improved the outreach to the community in a commendable way.

**Aṣṭāṅga Ayurveda (Eight Branches of Ayurveda)** - Ayurveda was divided into eight major clinical specialties.

- *Kāyacikitsā* (internal medicine) - This branch deals with general ailments of adults not treated by other branches of Ayurveda.
- *Śalya Tantra* (surgery) - This branch deals with various surgical operations using different surgical instruments and devices. Medical treatment of surgical diseases is also mentioned.
- *Śālākya* (disease of supra-clavicular origin) - This branch deals with dentistry, diseases of ear, nose, throat, oral cavity, head and their treatment by using special techniques.
- *Kaumārabhrtya* (paediatrics, obstetrics and gynaecology) - This branch deals with child care as well as the care of the woman before, during and after pregnancy. It also elaborates various diseases of women and children and their management.
- *Bhūtavidyā* (psychiatry) - This is study of mental diseases and their treatment. Treatment methods include medicines, diet regulation, psycho-behavioral therapy and spiritual therapy.
- *Agada Tantra* (toxicology) - This branch deals with the treatment of toxins from vegetables, minerals and animal origin along with development of their antidotes. The pollution of air, water, habitats and seasons has been given special consideration in understanding epidemics and pandemics.
- *Rasāyana Tantra* (rejuvenation and geriatrics) - This branch which is unique to Ayurveda, deals with prevention of diseases and promotion of a long and healthy life.



Fig. 1 - Ancient Indian Surgeon - Suśruta

- *Vājīkarana* (aphrodisiology and eugenics) - This branch deals with the means of enhancing sexual vitality and efficiency for producing healthy and ideal progeny.

## 1.2 Major Milestones

- |                     |   |
|---------------------|---|
| <b>5000-1000 BC</b> | – Documentation of information on health, disease and treatment in <i>Vedas</i> .   |
| <b>1000 BC</b>      | – Creation of <i>Agniveśa Tantra</i> which later on culminated into <i>Caraka Samhitā</i> as a compendium redacted by Dr̥dhabala and Caraka (around 100 AD) devoted to medicine and philosophy of Ayurveda. |
| <b>1000 BC</b>      | – Documentation of <i>Suśruta Tantra</i> later on redacted as <i>Suśruta Samhitā</i> by Nāgārjuna (around 100 AD), a compendium mainly devoted to anatomical and surgical aspects.                          |
| <b>600 AD</b>       | – <i>Aṣṭāṅga Saṅgraha</i> and <i>Aṣṭāṅga Hṛdaya</i> containing description of all aspects of Ayurveda were written by Vṛddha Vāgbhaṭa and Vāgbhaṭa respectively.  |
| <b>900 AD</b>       | – <i>Mādhava Nidāna</i> authored by Mādhava with a focus on etiopathogenesis and diagnostics.   |
| <b>1300 AD</b>      | – <i>Śāringadhara Samhitā</i> by Śāringadhara which added detail pharmaceutics to Ayurveda.   |
| <b>1600 AD</b>      | – <i>Bhāva Prakāśa</i> authored by Bhāva Miśra containing detailed information on medicinal plants, drugs, foods and treatments.  |
| <b>1800 AD</b>      | – Resurrection of Ayurvedic system of medicine under the rule of Peshwas.   |
| <b>1827</b>         | – Ayurveda classes started in Government Sanskrit College, Calcutta.  |
| <b>1920</b>         | – Indian National Congress Convention at Nagpur resolved to accept the Ayurvedic system of medicine as India's National Health Care System.   |
| <b>1922</b>         | – Teaching of Ayurveda started in Banaras Hindu University in the department of Oriental Learning and Theology.   |

## **Chapter 1: Introduction**

- 1921** – Mahatma Gandhi inaugurated Ayurvedic and Unani Tibbia College, Karol Bagh in Delhi.
- 1927** – Madan Mohan Malaviya established Ayurveda College in Banaras Hindu University, Varanasi.
- 1940** – Enforcement of Drugs and Cosmetics Act for Ayurvedic / Siddha / Unani medicines.
- 1956-57** – Establishment of Institute for Post-Graduate Training and Research in Ayurveda, Gujarat Ayurved University, Jamnagar, Gujarat.
- 1963-64** – Establishment of Post Graduate Institute of Indian Medicine at Banaras Hindu University, Varanasi, Uttar Pradesh.
- 1964-65** – Establishment of Central Board of Siddha and Ayurvedic Education.
- 1969** – Setting up of an apex Research Body i.e. Central Council for Research in Indian Medicine and Homoeopathy.
- 1970** – Indian Medicine Central Council Act, 1970 (IMCC Act) came into force for regulation of practice and uniform standards of education.
- 1970** – Establishment of Pharmacopoeia Laboratory for Indian medicine, Ghaziabad, U.P.
- 1971** – Constitution of Central Council of Indian Medicine under IMCC Act-1970 for regulation of education and clinical practice.
- 1972-1973** – Establishment of National Institute of Ayurveda, Jaipur, Rajasthan.
- 1976** – Publication of Part-I of Ayurvedic formulary of India containing 444 formulations.
- 1978** – Establishment of Central Council of Research in Ayurveda and Siddha (CCRAS), and renamed in 2011 as Central Council of Research in Ayurvedic sciences after bifurcation of Ayurveda and Siddha.

- 1983**
  - Setting up of Indian Medicine Pharmaceutical Corporation Ltd. (IMPCL), a drug manufacturing unit for Ayurveda and Unani medicines at Mohan, Distt. Almora, Uttarakhand.
- 1989**
  - Establishment of Rashtriya Ayurveda Vidyapeeth (National Academy of Ayurveda) at New Delhi to propagate *Guru-Sisya* tradition.
- 1995**
  - Creation of separate Department of Indian Systems of Medicine & Homoeopathy in the Ministry of Health & Family Welfare, Government of India.
- 2001**
  - Initiation of Traditional Knowledge Digital Library (TKDL).
  - Presentation on evidence based support by Department of ISM&H before House of Lords, U.K. against Sir Walton Committee's Report on status and nomenclature of Ayurveda among Complementary and Alternative systems of Medicine.
- 2002**
  - National Policy on Indian System Medicines and Homeopathy (ISM&H).
- 2003**
  - Department of ISM&H was renamed as Department of Ayurveda, Yoga & Naturopathy, Unani, Siddha and Homoeopathy (AYUSH).
- 2005**
  - Under the National Rural Health Mission (NRHM), the mainstreaming of AYUSH was important decision to introduce AYUSH at PHC, CHC and at District Level.
- 2007**
  - First volume of the Ayurvedic Pharmacopoeia of India (Part II), containing Pharmacopoeial standards of Ayurvedic compound formulations was published.
- 2008**
  - The Union Cabinet approved the establishment of All India Institute of Ayurveda (AIIA) at Sarita Vihar, New Delhi under Department of AYUSH, Ministry of Health & Family Welfare, Government of India.

## **Chapter 1: Introduction**

- Establishment of North East Institute of Ayurveda and Homeopathy at Shillong, Meghalaya.
- 2010** — Establishment of Pharmacopoeia Commission of Indian Medicines (PCIM) under the Department of AYUSH.
- 2011** — Publication of Ayurvedic Pharmacopoeia of India Part-I Vol. VIII, containing the quality standards of water and hydro-alcoholic extracts of Ayurvedic drugs (a Major development over the traditional method of using herbs).

### **1.3 Infrastructure and network**

A well-developed infrastructure of AYUSH systems exists in India which includes educational institutes, research organizations, public and private hospitals, dispensaries and registered private practitioners providing health care. At administrative level there is Department of AYUSH under Ministry of Health & Family Welfare, Government of India, and there are separate Directorates of AYUSH in 23 States. Through culturally and socially interwoven network with the community, AYUSH systems have very deep roots in the India's health care delivery. About 80-90% of population in India is reported to use Ayurveda and other traditional systems of medicine to meet their primary health care needs. As on 2011 the health care services are being extended to the masses through a huge network of 429246 registered Ayurveda practitioners, 2420 Ayurveda hospitals, 15017 dispensaries, 260 under graduate (UG) and 65 post graduate (PG) colleges (includes exclusive PG colleges and UG colleges those run both PG and UG courses). This infrastructure includes both public and private sector. About 8000 licensed drug manufacturing units produce classical and proprietary Ayurvedic medicines.

Under National Rural Health Mission, AYUSH facilities have been co-located in 240 district hospitals, 1716 community health centres and 8938 primary health centres of allopathic stream in 2010.

### 1.3.1 Premier organizations of Ayurveda - at a glance

**Department of AYUSH**

(Ayurveda, Yoga & Naturopathy, Unani, Siddha and Homoeopathy),  
Ministry of Health & Family Welfare,  
Government of India, IRCS Building,  
New Delhi-110001

Website: [www.indianmedicine.nic.in](http://www.indianmedicine.nic.in)

Governance and regulation of policies related to education, healthcare practice, research & development and quality, safety & rational use and accessibility of medicines in AYUSH systems.

**Central Council of Indian Medicine (CCIM)**

61-65, Institutional Area, Opp. D-Block, medicine.  
Janakpuri, New Delhi-110058

Website: [www.ccimindia.org](http://www.ccimindia.org)

Statutory Regulatory Body for regulating education and practice in Ayurveda system of

**Central Council for Research in Ayurvedic Sciences (CCRAS)**

61-65, Institutional Area, Opp. 'D' Block,  
Janakpuri, New Delhi-110058,

E-mail: [dg-ccras@nic.in](mailto:dg-ccras@nic.in)

Website: [www.ccras.nic.in](http://www.ccras.nic.in)

Apex research body in India for undertaking, coordinating, formulating, developing and promoting research in Ayurveda on scientific lines.

**National Institute of Ayurveda (NIA)**

Madhav Vilas Palace, Amer Road,  
Jaipur, Rajasthan -302002

E-mail: [nia-rj@nic.in](mailto:nia-rj@nic.in)

Website: [www.nia.nic.in](http://www.nia.nic.in)

This Institute is imparting under graduate, post graduate degree and Ph.D. courses as well as conducting research in Ayurveda.

**Institute of Post Graduate Teaching and Research in Ayurveda (IPGT&RA)**

Jamnagar

Email: [directoripgt@ayurveduniversity.com](mailto:directoripgt@ayurveduniversity.com)

Website: [www.ayurveduniversity.edu.in](http://www.ayurveduniversity.edu.in)

This institute is offering post graduate, Ph.D. courses and conducting research in Ayurveda.

Various courses & training for foreign students and also e-learning program of Ayurveda are available.

## Chapter 1: Introduction

### **Rashtriya Ayurveda Vidyapeeth (RAV)**

Dhanvantari Bhāvan, Road No.66, Punjabi Bagh (West), New Delhi-110026  
E-mail- ayurgyan@rediffmail.com  
Website: [www.ravdelhi.nic.in](http://www.ravdelhi.nic.in)

The institute is transferring Ayurvedic knowledge from eminent scholars and traditional *vaidyas* to younger generation through "*Guru-Śisya Paramparā*" method to prepare proficient experts in Ayurveda with clinical skills.

### **Banaras Hindu University**

Faculty of Ayurveda, Varanasi - 221005 ,  
Website: [www.bhu.ac.in](http://www.bhu.ac.in)

Pandit Madan Mohan Malaviya, the illustrious founder of Banaras Hindu University, had the vision of integrating the best of Ayurveda and modern systems of medicine. This basic idea initiated the training of Ayurveda in Banaras Hindu University in 1922 and currently as separate faculty, catering education, healthcare services in the field of Ayurveda through 14 departments. The faculty is greatly in collaborative interdisciplinary research.

### **All India Institute of Ayurveda (AIIA)**

Gautampuri, Mathura Road, Sarita Vihar,  
New Delhi - 110076

Institute is being established as an apex institute of Ayurveda to offer post graduate and doctoral course in various disciplines of Ayurveda and will focus on various aspects of research in Ayurveda. Presently only the patient care is functional in the institute.

### **North Eastern Institute of Ayurveda and Homoeopathy (NEIAH)**

Mawdiangdiang, Shillong, Meghalaya-  
793018

Institute is being developed to promote education, research and healthcare through Ayurveda & Homeopathy under one platform.

Website: [www.neiah.nic.in](http://www.neiah.nic.in)

### **Pharmacopoeial Laboratory for Indian Medicine (PLIM)**

Kamla Nehru Nagar, Ghaziabad, Uttar Pradesh-201002

Website: [www.plimism.nic.in](http://www.plimism.nic.in)

Appellate laboratory for testing Ayurvedic, Siddha & Unani medicines, developing and validating pharmacopoeial standards of single drugs and compound formulations of Ayurvedic, Siddha & Unani systems for incorporation in respective Pharmacopoeia.

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**Pharmacopoeia Commission for Indian Medicine (PCIM)** For developing the quality standards for Ayurveda, Siddha & Unani medicines.

Kamla Nehru Nagar, Ghaziabad, Uttar Pradesh-201002

**Indian Medicines Pharmaceutical Corporation Limited (IMPCL)** Engaged in manufacturing and supply of Ayurvedic and Unani medicines to central hospitals, dispensaries and central government research units all over India and state government departments besides making sales in the open market.

Mohan, District Almora, Via Ramnagar, Uttarakhand-244 715  
Website: [www.impclmohan.nic.in](http://www.impclmohan.nic.in)

**National Medical Plants Board (NMPB)** Coordinating and supporting program related to conservation, cultivation and development of medicinal plants.

Chandralok Building, 36, Janpath  
New Delhi – 110001

E-mail: [info-nmpb@nic.in](mailto:info-nmpb@nic.in),  
[ceo-mpb@nic.in](mailto:ceo-mpb@nic.in)  
Website: [www.nmpb.nic.in](http://www.nmpb.nic.in)

**Arya Vaidya Sala, Kottakkal (AVS)** AVS is a century old Charitable Institution engaged in the practice and propagation of Ayurveda. Arya Vaidya Sala offers classical Ayurvedic medicines and authentic Ayurvedic treatments and therapies to patients from all over India and abroad. The AVS also runs an Ayurveda education institution.

Kottakkal (P.O), Malappuram (Dist.), Kerala - 676 503,  
E-mail: [mail@aryavaidyasala.com](mailto:mail@aryavaidyasala.com)

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**Dr. Sarvepali Radhakrishnan Rajasthan Ayurved University** The Institutions affiliated to this University are conducting various Courses of Ayurveda.

Kadwad, Jodhpur–Nagaur Highway,  
Jodhpur-342037, Rajasthan  
E-mail : [rau\\_jodhpur@yahoo.co.in](mailto:rau_jodhpur@yahoo.co.in)  
<http://www.raujodhpur.org>

**Guru Ravi Dass Ayurved University,**  
Jodhamal Road, Kharkan  
Hoshiarpur, Punjab- 146001  
Email: [graupunjab@gmail.com](mailto:graupunjab@gmail.com)  
Website: [www.graupunjab.org](http://www.graupunjab.org).

The Institutions affiliated to this University impart Ayurveda education.

### **1.3.2 Regulatory Structure**

Education, practice, manufacturing for sale of medicines of Ayurveda are regulated by following Acts and Rules.

#### **A. Major Acts:**

- i. Indian Medicine Central Council (IMCC) Act, 1970 for regulation of education standards & clinical practices.
- ii. Drugs & Cosmetics Act, 1940 and Rules 1945 with a dedicated chapter for regulation of Ayurveda, Siddha and Unani drugs.
- iii. Drugs & Magic Remedies (Objectionable Advertisements) Act 1954 to prevent the misleading advertisement of certain cure claims on specific disease condition.

#### **B. Other Relevant Acts:**

- i. Indian Forests Act 1927 to conserve the medicinal plants species used in medicines.
- ii. Wild Life Protection Act 1972 to preserve and protect the threatened animal species and their parts etc. used in medicines etc.
- iii. The Narcotic Drugs and Psychotropic Substances Act 1985.
- iv. Bio-diversity Act 2002 to regulate the exploitation of certain plants and animal species used in medicines etc.
- v. Food Standard & Safety Act 2006 to regulate the safety and standards of food items etc.

### **1.4 Global Scenario**

In spite of advances in biomedical research and development, many new diseases are emerging. Prevention and management of chronic, non-communicable diseases are posing a global challenge. Previously, the communicable diseases were accounted for more incidents of death in the globe whereas in the present scenario chronic and lifestyle disorders and their

complications have been the cause of mortality and morbidity. These diseases need long-term treatment just for palliative care, which involves major economic liability on the individual and the country. Another serious issue is safety of synthetic medicines related to long-term use. A resurgence of interest in Ayurveda has resulted from the preference of many consumers for products of natural origin.

The Ayurvedic preventive and health promotive approaches and therapeutic modalities either stand alone or as add on therapies have an edge over the conventional medical approach in dealing with chronic and refractory disease conditions and life style related diseases. Ayurveda can offer solution in the management and improvement of quality of life in chronic diseases such as cancer, rheumatoid arthritis, bronchial asthma, skin allergies, eczema, psoriasis, liver disorders, obesity, hyper-lipidaemia and atherosclerosis, diabetes mellitus, hemiplegia and paraplegia, mal-absorption syndromes, ischemic heart disease, epilepsy and generalized anxiety disorder.

#### **1.4.1 Initiatives of Indian Government**

Sensing the resurgence of global interest in Ayurveda, the Government of India has taken many initiatives for promotion and propagation of Ayurveda. Some of such initiatives are enlisted below:

- i. International exchange of experts and officers.
- ii. Incentive to drug manufacturers, entrepreneurs, AYUSH institutions etc. for international propagation of AYUSH and registration of their products by USFDA/EMEA/UK-MHRA for exports.
- iii. Support for international market development and AYUSH promotion-related activities.
- iv. Promotion of Ayurveda, Unani and Yoga abroad through young Post Graduates.
- v. Translation and publication of AYUSH literatures in foreign languages.
- vi. Establishment of AYUSH information cells/health centres in Indian embassies/missions and in the cultural centres set up by Indian council for cultural relations (ICCR) in foreign countries and deputation of experts.
- vii. International fellowship programme for foreign nationals for undertaking AYUSH courses in premier institutions in India.

### **1.4.2 Achievements**

The Department of AYUSH has supported several international conferences /seminars / workshops/trade fairs in collaboration with Indian Missions, Universities, Associations and other agencies promoting traditional systems of medicine overseas. AYUSH experts are frequently deputed as resource persons to such events and also for facilitating Continuing Medical Education (CME) and training programs on AYUSH systems in foreign universities. Department through its Research Councils has signed Memorandum of Understanding with Universities in Germany, Trinidad & Tobago and South Africa for setting up Chairs on Ayurveda and Unani for cooperation in teaching, practice, research, exchange of expertise, mutual recognition of traditional systems, pharmacopoeia etc. MoU was signed between the Department of AYUSH and State Administration of Traditional Chinese Medicine in 2008. A MoU was also signed in 2010 between India and Malaysia for cooperation in Traditional Medicine. Under the Department's International Cooperation scheme the Department of AYUSH has set up an AYUSH information cell in the premises of the Indian cultural center in Malaysia with the support of Indian High Commission in Kuala Lumpur, Malaysia. India is a prominent member in the Inter-governmental committee (IGC) on Traditional Knowledge, Genetic Resources and Folklore of the World Intellectual Property Organization.



**Fig. 2 - Signing of a Memorandum of Understanding between Central Council for Research in Ayurvedic Sciences and Durban University of Technology, South Africa for establishing Ayurveda Chair at Durban University of Technology, Durban, South Africa on 17<sup>th</sup> September 2011.**

### **1.4.3 Collaborative Research Projects**

- ◎ Effectiveness and Safety of Ayurveda as a whole treatment system in osteoarthritis of the knee - a multicentre, randomized controlled clinical trial based on traditional Ayurveda diagnosis as per an agreement signed between the CCRAS, New Delhi and the institute for social medicine, epidemiology and health economics, Charite University Medical Center, Germany.
- ◎ Market survey of Ayurveda, Siddha and Unani drug exports in the ASEAN region, a study with Indian Institute of foreign Trade, New Delhi.



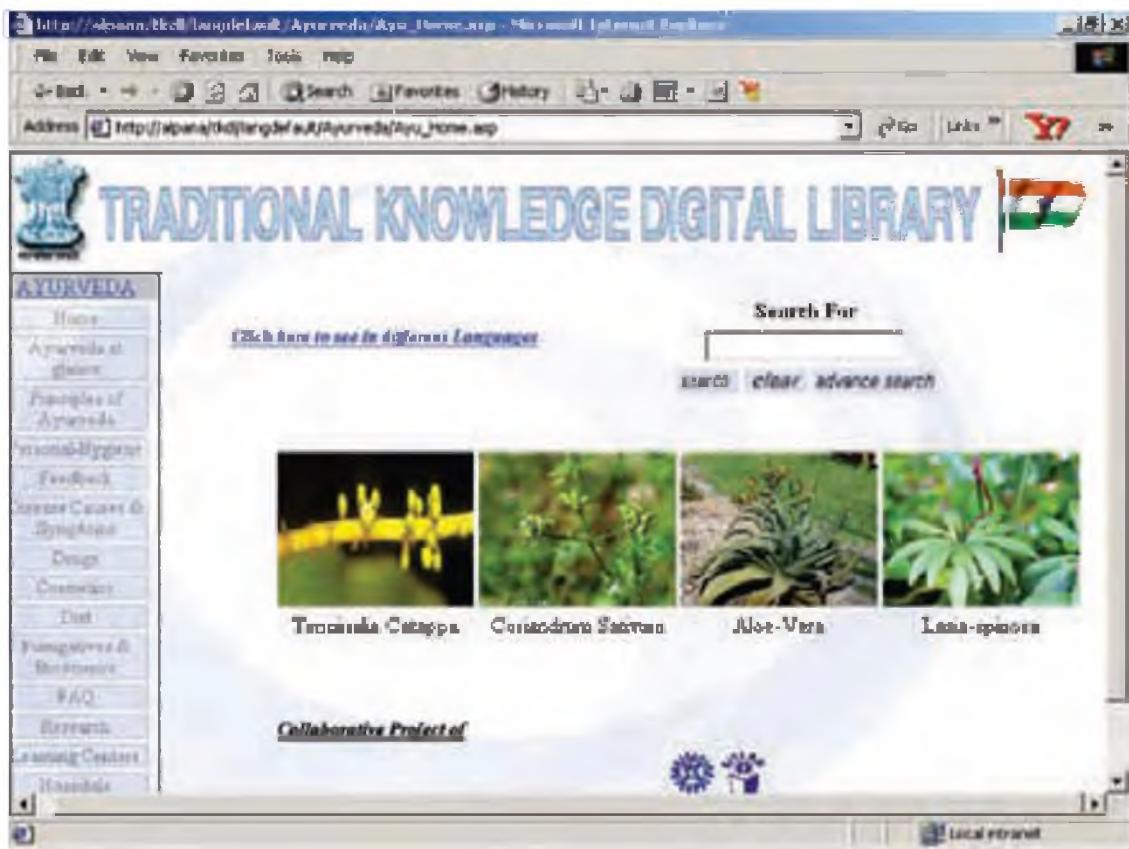
**Fig. 3 - Signing a Memorandum of Understanding between Central Council for Research in Ayurvedic Sciences, Department of AYUSH, Ministry of Health & Family Welfare, Government of Republic of India and the University of West Indies in presence of Dr. Manmohan Singh, Hon'ble Prime Minister of India and Mrs. Kamla Persad Bissessar, Prime Minister of the Republic of Trinidad and Tobago at New Delhi on January 06, 2012.**



Fig. 4 - Mr. Anil Kumar, Secretary, Department of AYUSH, Ministry of Health & Family Welfare, Government of India presenting Ayurvedic Pharmacopoeia of India to Hon'ble Salinda Dissanayke, Health Minister, Ministry of Indigenous Medicine, Sri Lanka on 08.02.2012 at Colombo, Sri Lanka.

#### 1.4.4 Traditional Knowledge Digital Library

The issue of discovery and commercialization of new products based in biological resources and traditional practices made headlines after Government of India successfully achieved revocation or limitation of turmeric and basmati rice patents granted by United States Patent and Trademark Office (USPTO) and the Neem patent granted by European Patent Office (EPO) in late 1990s. Soon cases of more such patent claims came into light and India's vast traditional medicine knowledge existed in languages like Sanskrit, Hindi, Arabic, Persian, Urdu, and Tamil, made it inaccessible for patent examiners at the international patent offices to verify such claims. This experience prompted the Department of AYUSH to create a task force of experts i.e. patent examiners, IT experts, scientists and technical officers for the creation of Traditional Knowledge Digital Library (TKDL).



**Fig. 5 - A view of TKDL Homepage**

TKDL is a collaborative project between Council of Scientific and Industrial Research (CSIR), Ministry of Science and Technology and Department of AYUSH. TKDL involves documentation of the knowledge available in public domain on traditional knowledge from the existing literature related to Ayurveda, Unani, Siddha and Yoga in digitized format in five international languages which are English, French, German, Spanish and Japanese. So far, the TKDL includes about 2.12 lakh medicinal formulations of Ayurveda, Unani and Siddha. Agreements have been signed with leading international patent offices such as EPO, UKPTO and USPTO to protect traditional knowledge from bio-piracy, by giving access to the TKDL database to patent examiners at International Patent Offices for patent search and examination. This project has found widespread appreciation in the IGC as first of its kind initiative which provides protection to our traditional medical knowledge by preventing its misappropriation.

At policy level Ayurveda is officially recognized in countries like Myanmar, Nepal, South Africa, Malaysia, Hungary, Sri Lanka. In many countries, there is no restriction to practice

Ayurveda, though it is not officially recognized. However, Ayurveda is also popular in many foreign countries including USA and Europe. People use Ayurvedic medicines, which are marketed as dietary/nutritional/herbal supplements.

## **1.5 Strength of Ayurveda**

**1.5.1 Comprehensive definition of health:** Ayurveda defines health as a state of equilibrium of *dosa* (regulatory and functional entities of the body), *dhātu* (structural entities), *mala* (excretory entities) and *agni* (digestive and metabolic factors) alongwith healthy state of sensory and motor organs and mind with their harmonious relationship with the soul. As against definition of health, the diseased state is defined in Ayurveda as a loss of equilibrium of essential body constituents. The objective of disease management is to bring back the equilibrium, principally through lifestyle management rather than through curative therapies. The strength of Ayurveda lies in its three fold holistic approach of prevention of disease, promotion of health and cure of disease. This is achieved through care of body, mind and soul where physical, mental and spiritual aspects of health are considered.

**1.5.2 Acceptance by the community:** About 80-90% of population in India is reported to use *Ayurveda* and other traditional systems of medicine to meet their primary health care needs. Safety of this system is attributed to time-tested use substantiated by scientific evidences. Besides, synergy of ingredients in conjunction with individual need based treatment plan forms the basis of efficacy and safety of Ayurvedic formulations. Specific guidelines are prescribed for the use of apparently toxic medicinal plants with certain detoxification processing that also enhance the bioavailability and efficacy of the final product.

**1.5.3 Emphasis on promotion of health and prevention of diseases:** Considering health of an individual as dynamic integration of environment, body, mind and soul, Ayurveda lays great emphasis on preservation and promotion of health and preventing the occurrence of diseases. The treatment modalities of Ayurveda are based on the inherent ability of the living body to rejuvenate, regenerate and restore the natural equilibrium. While treating the patient, Ayurvedic treatment helps to enhance the natural healing process in the body.

The prevention of disease and promotion of health is achieved by judicious practice of *dinacaryā* (daily regimen), *rtucaryā* (seasonal regimen) and *sadvṛtta* (ethical code of conduct) in accordance with *prakṛti* (psychosomatic constitution). In this way significance of healthy

life style for maintenance of health is emphasized by Ayurveda. Do's and don'ts on personal and social behavior are elaborated for attaining total health. Great emphasis is given on *Nidāna parivarjana* i.e. keeping away from factors which cause or precipitate the disease, whereas therapeutic procedures like *pañcakarma* help in eradicating the disease.

**1.5.4 Importance of diet and lifestyle:** The ultimate aim of this medical science is preservation of health and it can be attained in two ways, i.e. observation of lifestyle recommendations to prevent the diseases and eradication of already afflicted diseases. The prerequisites to attain the prevention include wholesome diet, conservation of environment, congenial social and cultural atmosphere. Diet is an essential factor for the maintenance of health. Ayurveda emphasizes on diversified aspects of dietetics and nutrition viz. quality, quantity, processing methods, rationale of combination of food articles, emotional aspects, nature of the consumer, geographical and environmental conditions etc. Advocacy of proper diet and life style, which is congenial to the individual maintains normal body functions thus prevents the diseases.

**1.5.5 Holistic concept of health:** Ayurveda considers a living being as a combination of body, mind and soul. All health management approaches are intended to maintain the harmony and homeostasis of these entities.

**1.5.6 Individualized approach:** Ayurveda considers that each individual has distinct psychosomatic constitution and health status. This is taken into account while advocating preventive, promotive and curative measures.

**1.5.7 Universal approach:** According to Ayurveda, the individual (microcosm) is a miniature replica of the universe (macrocosm). Every aspect of the universe is represented in the individual. Any change in the environment affects human being. Therefore, emphasis is laid on social and environmental factors which are interlinked with health.

**1.5.8 Stress on public health and eugenics:** The activities of the individual through his thought, word and deed have their good or bad effects on the environment. Ayurveda emphasizes upon healthy body, sound mind, benevolent speech and spiritual practices to create a healthy and happy environment. The pivotal role of eugenics mentioned in Ayurveda is to produce strong, healthy and ideal progeny.

**1.5.9 Use of natural products:** Ayurvedic products are derived mainly from plants and other natural resources. Supportive leads are emerging from revalidation of Ayurvedic drugs. Identification of active principles of some plants has led to discovery of many allopathic drugs. Some pharmacologically proven constituents of the Ayurvedic plants like *Aloe vera*, *Curcuma longa*, *Withania somnifera*, *Bacopa monnieri* etc. are used globally.

**1.5.10 Areas of clinical strength:** Ayurveda provides healthcare within the physical and financial reach of rural India. Some of the Ayurvedic medicinal plants and spices are widely used as home remedies in India for a wide range of common ailments. The common users of Ayurveda are individuals suffering from chronic intractable diseases. It is an accepted fact that Ayurveda is playing an important role in conditions like bronchial asthma & bronchitis, cardiovascular disorders, osteoporosis, joint and connective tissue disorders and early stages of dementia, Parkinson's disease, osteoarthritis etc.

Ayurvedic treatment is effective in chronic disorders like sinusitis, diabetes mellitus, hypertension, obesity; psychosomatic disorders like depression, insomnia; digestive disorders like irritable bowel syndrome (IBS), peptic ulcer, inflammatory bowel diseases; respiratory disorders like bronchial asthma and chronic obstructive pulmonary disease; musculo-skeletal disorders like arthritis, osteoporosis; neurological and neuro-degenerative disorders like paralytic conditions, sciatica, dementia, Parkinson's disease etc.

**1.5.11 Unique therapeutic approach:** Ayurveda advocates certain bio-cleansing and rejuvenating therapeutic measures such as *pañcakarma*, *rasāyana* for maintenance of healthy state as well as in the management of chronic diseases. *Kṣarasūtra*, a minimal invasive para-surgical procedure using medicated thread, widely cited in ancient medical literatures for its safety and efficacy is being successfully practiced as promising therapy for ano-rectal disorders. Such unique specialties of Ayurveda either as stand alone or add on therapies are proven to have an edge over conventional medical approach in disease management and improving quality of life.

**1.5.12 The way forward:** Ayurveda can contribute in the management of chronic and refractory disease conditions sharing huge global burden such as cancer, rheumatoid arthritis and allied conditions.

## **1.6 Organization of the Document**

This document is a brief presentation of important and relevant aspects of Ayurveda organized in seven chapters for large section of readers such as medical professionals, academicians, researchers, policy makers, students and others who wish to know about Ayurveda.

**Chapter 1** - The chapter highlights historical evolution of Ayurveda, its contemporary development and important developmental milestones. Infrastructure, facilities for education, patient care, research, international cooperation and manufacturing of medicines with regulatory framework and policies implemented by the government are also briefly mentioned. Specific historical background on education, pharmaceutics and practice are mentioned in the concerned chapters.

**Chapter 2** - Ayurveda has very unique and holistic approach towards health and diseases. This chapter gives an overview on fundamental principles of Ayurveda with reference to its concepts, theories and practices. A brief account of progression of diseases, methods of examination of the patients and diagnosis of the diseases is provided here.

**Chapter 3** - Maintenance of health through prevention of diseases is primary objective of Ayurveda. Ayurveda advocates individualized guidelines for attaining physical, mental, social and spiritual health. Daily & seasonal regimen and ethical & moral code of conduct are important among them. Equal importance is given to the diet for maintaining good health. The focus of this chapter is on preventive aspects like food and lifestyle recommendations.

**Chapter 4** - This chapter deals with all aspects of preparation of medicines. Safety, efficacy, stability and palatability are the four basic requirements of a good medicine. The pharmaceutical procedures for any drug involve various steps starting from identification and collection of authentic raw material, application of standardized processing techniques and production of quality drug to packaging and storage of the finished product.

**Chapter 5** - Ayurveda prescribes various medicines and therapeutic procedures for the management of diseases in addition to non pharmacological measures. This chapter provides an outline of different therapeutic approaches and description of core specialties of Ayurveda such as *pañcakarma*, *kṣarasūtra* and *rasayana*.

**Chapter 6** - With increasing global interest in Ayurveda, R&D activities have gained momentum in this area. The research in this area is undertaken by research institutions,

## **Chapter 1: Introduction**

Universities, medical colleges, AYUSH colleges, hospitals and pharmaceutical industry both in public and private sector. This chapter focuses on core aspects of research and development in Ayurveda and some noteworthy outcome of research. Detail activities and achievements of Central Council for Research Ayurvedic Sciences are also mentioned. A number of medicinal plants used in Ayurveda have been studied and these evidences have provided some promising leads and some such plants have been mentioned along with photographs at the end of this chapter.

**Chapter 7 -** The education and medical practice are organized and regulated by the government. Different curricula with standard syllabi are prescribed by the regulatory council. Huge network of educational institutions exist both in government and private sector. Seats are also available for foreigners to study Ayurveda in premier institutions. Outreach of Ayurvedic treatment to the patients has increased manifold and the facilities are available at peripheral centres of healthcare delivery system.

The document has been written on the basis of the references available in published texts and websites. The additional information may be obtained from books, journals and websites enlisted in the "suggestive reading".

It is difficult to give exact English translation of *Sanskrit* words. To help the readers to understand the Ayurvedic technical terms, the nearest possible English meaning is given in the Glossary at the end of this document.

**Note to the readers:** Primary evidence on history and evolution of Ayurveda are ancient Ayurvedic texts and their commentaries. In this document certain books and journals mentioned in the section on "suggestive reading" have been taken as basis for writing this chapter. For the ease of the readers, the information has been provided in an abstract manner. The readers may obtain more information from the books, journals and websites mentioned in the concerned section of the document such as:

- 1 Nishteswar K, Vidyanath R. A Handbook of History of Ayurveda. Varanasi, India: Chaukhamba Sanskrit Series; 2004.
- 2 Journal of Indian Medical Heritage. National Institute of Indian Medical Heritage, Hyderabad-500195, Andhra Pradesh.

- 3 Indian Journal of Traditional Knowledge. Sales and Distribution Officer, National Institute of Science Communication and Information Resources, Dr K S Krishnan Marg (Near Pusa Gate), New Delhi - 110 012.
- 4 Satyavati GV. Some Traditional Medical System and Practices of Global Importance The Great Concern Traditional medicinal Systems-I, A Quarterly News Bulletin of Indo-German Social Service Society, New Delhi, 1999.
- 5 Jaggi OP. History of Science and Technology in India .Vol.7.Delhi, India: Atma Ram Sons; 1977.
- 6 Sharma PV. History of medicine in India. Indian National Science Academy, New Delhi, India.

## Chapter 2

### FUNDAMENTAL CONCEPTS

#### 2.1 Basic principles

**2.1.1 *Pañcamahābhūta* (five basic elements)** - The Universe according to Ayurveda is composed of five basic elements called *Pañcamahābhūta* viz. *ākāśa* (basic ethereal element), *vāyu* (basic gaseous element), *agni* (basic thermal element), *jala* (basic aqueous element) and *pr̥thvi* (basic earthy/ gross element) and so is the human body. There is a fundamental similarity between universe and man. A harmonious interaction between the microcosm (human being) and the macrocosm (universe) is the basis of health.

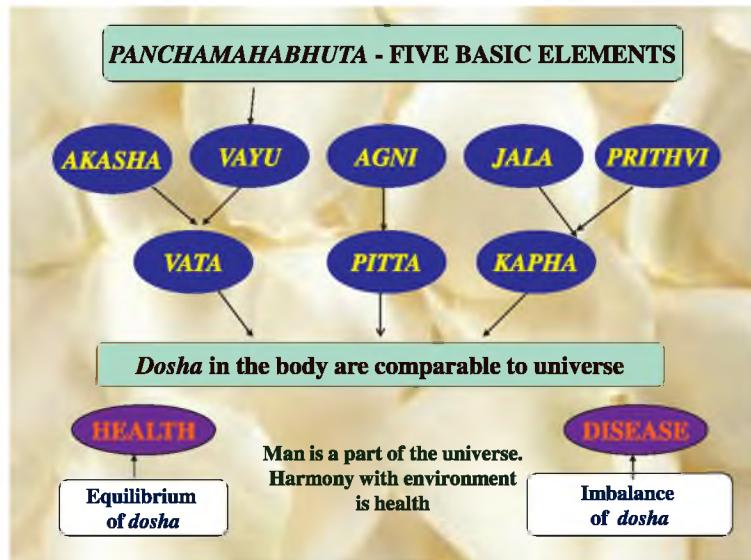


Fig. 6 - Similarity between universe and human being

**2.1.2 Health and disease** - Optimal health conceived in Ayurveda is a perfect harmony of body, mind and soul. Health or "*svāsthya*" is a state of equilibrium of the *dosa* (regulatory physiological entities), *agni* (digestive and metabolic factors), function of *dhātu* (structural entities), *mala* (excretory entities) along with proper functioning of *jñānendriya* (sense organs), *manas* (cheerful mind) and *ātmā* (soul). Any disturbance in this

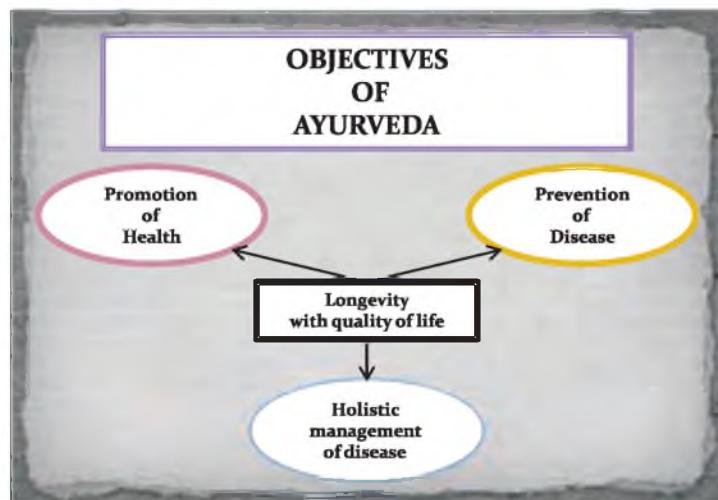


Fig. 7 – Objectives of Ayurveda

equilibrium due to internal or external factor leads to diseases. Ayurveda emphasizes that *Prakrti* (psychosomatic constitution), which is specific to every individual, is responsible for the health or disease pattern in the individual. Human mind has *triguna* (three attributes) i.e. *sattva* (pure state of mind), *rajas* (mind with passion/desire/ attachment) and *tama* (inert/ignorant mind), which interact with the biological components, *vāta*, *pitta* & *kapha* and determine the psycho-somatic constitution of an individual. Ayurvedic approach to examination of psychosomatic constitution is important in assessing individual's health for planning preventive measures for selecting diet, medicine or treatment regimen.

### **2.1.3 *Tridosa* (Three Regulatory Physiological Entities)**

The doctrine of *Pañcamahābhūta* is the origin and basis of the three regulatory physiological entities i.e. *vāta*, *pitta* and *kapha*. *Vāta* is derived from the basic element *vāyu* and *ākāśa*, *pitta* from *agni*, *kapha* from *jala* and *prthvi*.

- i. *Vāta* - The important function of *vāta* is to impart movement, generation and conduction of impulses, transportation of biological materials and elimination of waste products. In the normal condition, *vāta* performs entire neurological functions of the body. It sustains the entire machinery of the body. *Vāta* is responsible for functioning of five sensory organs (*Pañca jñānendriya*) and motor functions also. It is a regulator of psychosomatic functions of the living body. When *vāta* is vitiated or its equilibrium is disturbed, it brings about various psycho-somatic disturbances. All the basic emotions like worry, anxiety, fear, grief, anger etc. are governed by *vāta*. Usually all functions of nervous system at central and peripheral level is correlated with *vāta*.
- ii. *Pitta*- *Pitta* represents transformation. It governs digestion, absorption, assimilation, nutrition, metabolism, body temperature, skin coloration, luster of the eyes, intelligence, and understanding. Psychologically, *pitta* arouses anger, hate, and jealousy. Morbidity of *pitta* may lead to insomnia, abnormality of body temperature, yellow discoloration of eyes, impaired digestion/metabolism etc. Usually digestive juices, enzymes and hormones come under this entity.
- iii. *Kapha*- *Kapha* is one of the primary constituent of the living body. It exhibits psychological phenomena as the exhibition of the courage, forbearance, zest, virility, knowledge, understanding etc. Similarly, the physical function of *kapha* is responsible for the physical strength, built, stability of structures, cooling, adhesion, lubrication,

maintenance of the smooth working of the joints etc. It is also expressed in tendencies toward calmness, forgiveness and love.

These *tridosa* are described as the main cause for health and disease. The health is maintained if they remain in balanced state and if they are deranged in any manner, they vitiate structural and excretory entities to cause *vikāra/roga* (disease).

#### **2.1.4 *Saptadhātu* (Seven Structural Entities)**

The structural elements in the body are classified as *dhātu*. They are seven in numbers and are responsible for maintaining the body in a compact and composed state. They are *rasa* (nutritional fluid), *rakta* (blood), *mamsa* (muscle tissue), *medas* (adipose tissue), *asthi* (bone tissue), *majjā* (bone marrow) and *śukra* (reproductive elements). According to Ayurveda, *āhāra rasa* (nutrient fluid) nourish these tissues. Apart from this, there are six *upadhātu* (supportive bye products of *dhātu*), namely *stanya* (breast milk), *ārtava* (menstrual fluid), *kandarā* (tendons), *śirā* (blood vessels), *vasā* (fat), *tvak* (skin), *snāyu* (ligament).

#### **2.1.5 *Ojas* (Essence of *dhātu*)**

Ayurvedic texts have vividly described the factor of immunity in terms of *vyādhikṣamatva*, which is considered as the natural or acquired biological defense of an individual against diseases. This power is attributed to the presence of a biological factor called *ojas*, the essence of the structural entities (*dhātu*), which literally means vigor. Ayurveda also describes a number of methods to promote *ojas* and *vyādhikṣamatva*.

#### **2.1.6 *Mala* (Excretory Entities)**

*Mūtra* (urine), *puriṣa* (faeces) and *sveda* (sweat) are the three gross excretory entities. The exudates eliminated from eye, nose, mouth, ears and reproductive organs and other structural entities etc. are considered as subtle excretory entities. Proper elimination of these excretory entities is also required to maintain health. Their hypo, hyper and irregular state results in diseases.

#### **2.1.7 *Srotas* (Micro and Macro Channels)**

The concept of *srotas* occupies an important position in the development of conceptual frame work of Ayurveda. According to Ayurveda whole body is made up of *srotas* (micro and macro

channels), which transport all types of materials in the body. For normal functioning of the body, it is essential that these channels, both micro and macro remain intact.

- i. *Prāṇavaha srotas* - Channels of respiration/respiratory system
- ii. *Udakavaha srotas* - Channels for regulation and transportation of fluids
- iii. *Annavaha srotas* - Digestive tract
- iv. *Rasavaha srotas* - Channels in which nutrient fluid is formed and transported
- v. *Raktavaha srotas* - Channels through which blood is formed and transported
- vi. *Mamsavaha srotas* - Channels in which muscle tissue is formed and transported
- vii. *Medovaha srotas* - Channels in which adipose tissue is formed and transported
- viii. *Asthivaha srotas* - Channels in which bone tissue is formed and transported
- ix. *Majjāvaha srotas* - Channels in which bone marrow is formed and transported
- x. *Śukravaha srotas* - Channels in which reproductive tissue is formed and transported
- xi. *Mūtravaha srotas* - Channels in which urine is formed and excreted
- xii. *Svedavaha srotas* - Channels in which sweat is formed and transported
- xiii. *Puriṣavaha srotas* - Channels in which faeces is formed and excreted

Therefore, emphasis has been given in Ayurveda to prevent *srotoduṣṭi* (vitiation of *srotas*).

### **2.1.8 Agni (Digestive and metabolic factors)**

The digestive and metabolic energy that is responsible for transformation of food to nutrients is called *agni*. It is responsible for digestion and metabolism in the body. In other words *agni* signifies life process responsible for entire digestion, endocrine and metabolic activities. It has been classified into the following 13 types:

1. *Jatharāgni* (digestive factors located in digestive tract)
2. Five types of *Bhūtāgni* (metabolic factors located in *pañcamahābhūta*)
3. Seven types *Dhātvagni* (metabolic factors located at *dhātu*)

*Jatharāgni* is the most important *agni* and supports the other type of *agni*. Derangement of *agni* viz. *mandāgni* (down regulation), *tikṣṇāgni* (hyper-active), *visamāgni* (deranged state) lead to diseases and *samāgni* (balanced *agni*) maintains the health of an individual.

### 2.1.9 **Manas (Mind)**

Mind is a principal sense organ which controls remaining five senses. The mind is called *atīndriya* (beyond the perception of senses). The sense-organs receive the stimulus from the external world and are perceived through mind and passed to the *ātma* (soul). The chief function of *manas* is assimilation and discrimination. It has been stated that it enables the *buddhi* (intellect) to discriminate good and bad, right and wrong. It has normal functions like to think, to determine or decide, to express, to conceal, to recall, to concentrate, to memorize, to control emotion, to meditate etc. The emotional factors like lust, anger, greed, delusion and hallucination or confusion, malice, remorse and anxiety, fear, exhilaration are all responsible for psychosomatic disorders. The above description of mind clearly indicates that it is a controlling component of the body and it is largely influenced by external socio-cultural factors. The body can be prevented from the stress by controlling the mind. Patañjali in his *Yoga Sutra* has clearly propounded yoga system for the control of mind and maintenance of positive health.

### 2.1.10 **Prakṛti (Psychosomatic Constitution)**

The structural and functional variations are the fundamental characteristics of human being. No two individuals are exactly alike either in their morphological, physiological or behavioral dimensions. The individual differ in their genetic makeup and also in morphological and psychological aspects including their endocrine activity and metabolic efficiency. Ayurveda has given maximum attention regarding the clinical significance of individual personality and also recognized the dichotomy between mind and body and classified psychological personality in terms of *sāttvika*, *rājasika* and *tāmasika* where as somatic constitution is determined by relative predominance of *vāta*, *pitta* and *kapha* in an individual. Ayurvedic concept of *Prakṛti parīkṣā* is to know body- mind constitution to predict the susceptibility of disease. *Prakṛti* is considered while prescribing diet, medicine or treatment regimen to an individual.

**Characteristics of *vāta* predominance *prakṛti* -** *Vāta* type person are thin, tall, disproportionate, under-developed in general physique, chest is flat and depressed, veins are prominent and will have markedly projected ends of bone. *Vāta* type individual looks emaciated with rough dark, pale, dusty complexion and dry cracked rough skin. Psychologically these persons are characterized by short memory and low will power.

*Vāta* type individuals are mentally unstable due to the predominance of *vāta* activity. They have least power of reasoning and they are of irritable temperament. They are comparatively non-religious and coward. The life span of *vāta* type individual is comparatively low. Due to predominance of rajas traits, *vāta* type individuals are more susceptible to psychosomatic disorders. A comprehensive regimen of life has been advocated for the prevention of diseases for the *vāta* type individuals in almost all the classical texts of Ayurveda.

**Characteristics of *pitta* predominance *prakṛti*-** *Pitta* dominant individuals are medium in strength, stature and body built. They have fair and coppery complexion, smooth, very soft & wrinkled skin and thin, silky and brownish hair. The psychological traits of such individuals are sharp, bright, intelligent and short tempered. If we trace the origin of *pitta* personality from *triguna* point of view, *sattva* predominates in this constitution. Individual of this type of personality is more prone to blood borne skin and diseases. Therefore, such individuals have been advised to live in a cool place and use diet which is antagonistic to *agni mahābhūta*.

Characteristics of *kapha* predominance *prakṛti* - Physically *kapha* type people are strong with heavy & proportionate body built and fair complexion. They are biologically strong; therefore are more virile and have good progeny. From psychological point of view such individuals are mentally stable with maximum capacity for retention. In Ayurvedic texts *kapha* type of personality is considered to be the ideal type of personality because they take the balanced approach to life. They have maximum capacity to withstand stress. Since, *kapha* type people are biologically strong; they are less prone to develop psychosomatic disorders.

### 2.1.11 Clinical diagnosis

The diagnosis in Ayurveda is based on two-fold approach viz. (1) examination of the patient i.e., *rogi parīkṣā* and (2) diagnosis of the disease i.e. *roga parīkṣā*. The *rogi parīkṣā* is essentially concerned with ascertaining the psychosomatic constitution and status of health & vitality of the individual. This is achieved through ten fold examinations (*daśavidha parīkṣā*), eight fold examination (*aṣṭasthāna parīkṣā*) three fold examination (*trividha parīkṣā*) of the patient. For the proper treatment of diseases, it is mandatory to understand the exact nature of the disease with reference to *dosa*, *dhātu*, *mala* and *agni*. The diagnosis of the disease is also done with the help of *śatkriyākāla* (six stages of pathogenesis), *nidāna pañcaka* (five fold approaches of diagnosis).

### **2.1.12 Principles of Management**

The approach of Ayurveda is holistic and individualistic. The promotive and preventive aspect of Ayurveda is called *svasthavṛtta* that includes personal and social hygiene, regular daily and seasonal regime and appropriate social behaviour. The curative treatment consists of three major constituents, *āhāra* (food), *vihāra* (lifestyle) and *ausadha* (drug/ medicament). Ideal treatment according to Ayurveda is one which cures the disease without causing adverse effect. Three classical therapeutic streams advocated by Ayurveda are (1) *daivavyapāśraya cikitsā* (spiritual therapy) (2) *yuktivyapāśraya cikitsā* (rational treatment) and (3) *sattvāvajaya cikitsā* (psycho-behavioral therapy). The Ayurvedic treatment methods can be grossly divided into three methods *samsodhana* (bio-cleansing therapy), *samsamana* (palliative therapy) and *Nidāna parivarjana* (avoidance of causative factors). *Samsodhana* is the modality by which effort is made to remove disease causing factors like metabolic wastes/toxins from the body. This is practiced through one or more therapies from *pañcakarma*. *Samsamana* is the modality of treatment by which the disease causing factors are pacified inside the body and this is achieved through three types of therapies viz. food, lifestyle and medicine.

### **2.1.13 Holistic and Individualized Approach**

Ayurveda employs holistic and personalized approach to health. The holistic, integrative and systems approach of Ayurveda involving body, mind, and soul is a pivotal attribute. Taking the human being as a whole, the Ayurvedic preventive and therapeutic approaches aim at homoeostasis of this integrated milieu. Diverse approaches of clinical examination and diagnosis viz. *Prakṛti*, *agni*, *srotas*, and *saṃkriyākāla* etc. form determinants of individual specific precise tailor-made treatment plan. Furthermore, the systems approach embodied with Ayurveda concepts such as, disease process, diagnosis, principles of drug action, processes, dosage forms, diet, therapeutics and personalized approach towards lifestyle advocacy, disease management are highly appreciated since antiquity which are now the evolving concepts of pharmaco-epidemiology, pharmaco-genomics of modern medical science.

## 2.2 Disease Process

Disease is defined as a state of disturbance of homoeostasis in *dosa*, *dhātu*, *agni*, *mala*, *indriya* and *manas* resulting in the physical and psychological discomfort. The entire phenomena right from the vitiation of *dosa* to the manifestation of disease is known as *samprapti*.

Three major factors ascribed to the causation of the disease are:

1. *Prajñāparādha* (intellectual irreverence)
2. *Asātmyendriyārtha Samyoga* (erroneous interaction of senses with their objects)
3. *Parināma* (effect of time, season and environment)

Pathogenesis of disease has six stages known as *satkriyākāla*:

1. *Sañcaya* (accumulation of *dosa* in their respective places)
2. *Prokopa* (vitiation of accumulated *dosa*)
3. *Prasara* (spread of deranged *dosa*)
4. *Sthānsamśraya* (accumulation of *dosa* at a particular site)
5. *Vyaktāvasthā* (signs and symptoms / manifestation of disease)
6. *Bhedāvasthā* (stage of differentiation and complications of disease)

These are different stages of development of diseases. The concept of *satkriyākāla* is very useful to intervene at the initial stage of pathology to prevent the progression of disease and its complications.

**2.2.1 Āma (end product of improper digestion and metabolism)** - The term *āma* means end product of improperly digested food. In particular, it is a toxic byproduct generated due to improper or incomplete digestion as a result of *mandāgni*. The formation of *āma* may lead to many diseases.

## 2.3 Diagnostics and Therapeutic Management

### 2.3.1 Diagnostics

The practice of Ayurvedic clinical medicine has two distinct modalities. The dual approach in terms of diagnosis of the disease and clinical examination helps in attaining a concrete diagnosis.

**2.3.1.1 *Roga pariksā*** (diagnosis of the disease) - As per Ayurveda, for the proper treatment of diseases, it is mandatory to examine the exact nature of the disease with reference to *dosa*, *dhātu*, *mala* and *agni*. The nature of the disease can be understood with the help of the following five means known as *nidāna pañcaka*:

1. ***Nidāna* (cause of the disease)** - The factors which cause diseases are known as *nidāna*. Detailed description of the various categories of *nidāna* is given in Ayurvedic texts for particular diseases.
2. ***Pūrva Rūpa* (prodromal signs and symptoms)** - The knowledge of this stage helps the physician in the diagnosis of the disease well before it is manifested. It also helps in differential diagnosis and in determination of the prognosis. Certain prescriptions and prohibitions are to be followed in this stage to prevent its further progress.
3. ***Rūpa* (signs and symptoms)** - This is a stage of manifestation of the disease. In this stage the disease is manifested with its specific signs and symptoms. The disease can be differentially diagnosed at this stage.
4. ***Upasaya* (relieving factors)** - It refers to the disease relieving medicines, diet and lifestyle. It helps in the differential diagnosis of diseases.
5. ***Samprāpti* (pathogenesis)** - The *samprāpti* is the process of development of disease.

Other than these methods at present the latest diagnostic techniques are also used by Ayurvedic practitioners.

**2.3.1.2 Classification of diseases-** Diseases are classified on the basis of their origin, etiology as well as prognosis in Ayurveda. They are mainly intrinsic and extrinsic. However, there are many other classifications such as genetic, congenital, psychological, seasonal, spiritual etc. It has been advised to plan the treatment according to the prognosis of the disease. Certain genetic, congenital, neurological and surgical diseases are identified as incurable. Others like chronic and recurrent diseases are difficult to treat. Therefore, while deciding the treatment such limitations should be kept in mind. Broadly, the prognosis has been classified as *sādhyā* (curable), *kāṣṭasādhyā* (difficult to cure), *yāpya* (maintainable) and *asādhyā* (incurable). Due to no or improper treatment, any curable disease may reach other stages.

### 2.3.1.3 *Rogi parīkṣā* (Clinical Examination)

**Daśavidha parīkṣā** (ten fold examination schedule)- This examination schedule is to evaluate various aspects of personality, temperament and health status of the patient.

1. **Prakṛti**- The *Prakṛti* of an individual refers to the genetically determined psychosomatic constitution. The features of the different types of *Prakṛti* are described elaborately in Ayurveda.
2. **Vikṛti**- *Vikṛti* refers to the pathological condition. By considering the history of past and present illness and through examination one can estimate and predict the possible susceptibility of an individual to different ailments.
3. **Sāra**- The *sāra parīkṣā* is meant to examine the qualities of *saptadhātu* and the *sattva* (psyche). These eight components are examined in terms of relative quality i.e. *pravara* (superior), *madhyama* (medium) and *avarā* (inferior).
4. **Samhanana**- *Samhanana* means compactness of the body and reflects the quality of overall body built. A good proportionate body built is endowed with good health, immunity and better prognosis. The *samhanana* is a qualitative assessment of the body frame and is described in terms of superior, medium and inferior.
5. **Pramāṇa**- *Pramāṇa* is anthropometry, which is relative measurement with own fingers. The Ayurvedic texts describe in detail the normal and abnormal dimensions of all body parts.
6. **Sātmya**- It is the ability to adapt different atmosphere, food, circumstances etc.
7. **Sattva**- *Sattva parīkṣā* is the examination of mental stamina. The purpose of *Sattva parīkṣā* is to evaluate and to qualitatively categorize the individuals as having superior, medium and inferior quality of mind.
8. **Āhāra śakti**- It is examined by the capacity to ingest and to digest. If the physician is aware of appetite and digestive capacity of the patient he can plan diet and medication rationally.
9. **Vyāyāma śakti**- This is the evaluation of the endurance of the patient to work and exercise.
10. **Vaya Parīkṣā**- This is the assessment of biological and chronological age of the patient.

**Trividha Parīkṣā** (three fold examination of the patient) - In this method the patient is examined by three different methods viz. *darśana* (inspection), *sparśana* (palpation and percussion) and *praśna* (interrogation).

**Astavidha Parīkṣā** (eight fold examination of patient) - Following are the eight fold examinations

1. **Nadi Parīkṣā** (pulse examination) - Pulse is examined with respect to its rate, volume, tension and type of pulsation. The status of *dosa* in relation to age, sex, constitution, time of the day, season, physical activity, food intake, status of mind etc. may illustrate a distinction in the quality and quantity of pulse.
2. **Mūtra Parīkṣā** (urine examination) - The urine is examined with respect to its appearance, clarity, volume, colour etc. Urine examination is specially employed by Ayurvedic practitioners to understand the nature of disease with respect to its curability.
3. **Mala Parīkṣā** (stool examination) - The status of the digestive system is typically reflected in the character of stool. As a number of systemic disorders can modify the nature of the stool, its examination helps in attaining the final diagnosis.
4. **Jihvā Parīkṣā** (tongue examination) - Tongue is usually examined with respect to perception of taste, its appearance, colour, roughness and softness of surface, presence of coating on its surface and its nature. Examination of tongue also gives idea about the status of digestion and the disease state. Typical tastes are perceived by the patient in specific diseases.
5. **Sabda Parīkṣā** (voice/sound examination) - Voice of the patient is examined with respect to its quality and nature. The nature of voice differs in accordance with the psychosomatic constitution of the individual. Change in quality of voice is an indicator of the status of the disease and physical status of the patient.
6. **Sparsā Parīkṣā** (palpation and percussion) - Palpation is useful in knowing tenderness, temperature, change in the texture and contour of body parts etc. percussion also helps in arriving at provisional diagnosis.
7. **Drk** (eye/vision examination) - The changes in the colour, expression etc. exhibit the character of the morbid *dosa* and are helpful in arriving at diagnosis and prognosis.
8. **Akrti** (stature) - General appearance of the patient will be affected in some of the neurological problems, nutritional disturbances, disabilities etc.

Different diagnostic techniques are utilized by the Ayurvedic practitioner while examining the patients. These techniques involve subjective as well as objective methods. The practitioner utilizes these techniques to his advantage and wisely uses them for diagnosing the disease and designing the schedule of therapeutic management.

#### **2.3.1.4 Therapeutic Management**

Ideal treatment according to Ayurveda is one which cures the disease without causing adverse effect. Three classical therapeutic streams advocated by Ayurveda are (1) *daivavyapāśraya cikitsā* (spiritual therapy) (2) *yuktivyapāśraya cikitsā* (rational treatment) and (3) *sattvāvajaya cikitsā* (psycho-behavioral therapy). The Ayurvedic treatment methods can be grossly divided into three methods; *saṃśodhana* (bio-cleansing therapy), *saṃśamana* (palliative therapy) and *nidāna parivarjana* (avoidance of causative factors). *Saṃśodhana* is practiced through one or more therapies from *pañcakrama* whereas *saṃśamana* is achieved through three types of therapies viz. food, lifestyle and drug.

**Note to the readers:** The readers may obtain more information from the books, journals and websites mentioned in the concerned chapters of the document such as:

1. Agnivesa. Caraka Saṃhitā English Translation by Dash, Bhagwan and Sharma RK. In 3 volumes. Varanasi, India: Chaukhambha Publications, 2<sup>nd</sup> Edition, 2000.
2. Dash Bhagwan Fundamental Principles of Ayurveda. New Delhi, India: Konark Publications Pvt. Ltd.; 1989.
3. Dwarakanath C. Introduction to Kayacikitsa. Varanasi, India: Chaukhambha Publications; 1986.
4. Vagabhata. Astanga Samgraha Commentary by Dasai R. IIInd edition .Nagpur, India: Baidyanath Ayurveda Bhawan; 1981.
5. Suśruta. Suśruta Saṃhitā. 5<sup>th</sup> Edition. New Delhi ,India: Motilal Banarasidas; 1994.

## Chapter 3

### LIFESTYLE MANAGEMENT

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#### 3.1 Food

The maintenance of health and prevention from diseases can be achieved through food and lifestyle specific to individual needs and in line with the seasons and cycles of nature. Food and habits which are conducive to the body are known as *pathya*. Food is referred as '*mahābhaisajya*' (the best medicine) by Ayurvedic classics. Ayurveda describes a large number of food and drinks, their method of preparation and the code and discipline of taking the food. The food has been given a godly status and is considered a subject of worship. The food is essentially said to have the five basic elements. Their appropriate use may help in balancing the similar elemental components of the body.

Bad eating habits are the basic cause of indigestion which is root cause for all diseases. Ayurvedic texts enlist bad eating habits such as:

- Unwholesome and non- congenial food
- Incompatible food combinations
- Consumption of food before the digestion of previously eaten food or when not hungry
- Overeating
- Too much water or no water at all during a meal
- Eating hurriedly
- Eating while emotionally upset
- Eating at the wrong time of the day
- Eating too much heavy or too light food
- Improperly preserved and stale foods
- Use of too spicy, sour, salty food

**3.1.1 *Sadrasa*** (six tastes of food items) - The concept of *sadrasa* is a central point in Ayurvedic cuisine. These six tastes viz. sweet, sour, salty, pungent, bitter and astringent

should be present in balanced proportions. Each taste has an influence on *dosa* and hence contributes to the health or disease.

**3.1.2 Eight factors of diet and dietetics:** Ayurveda offers some basic dietary guidelines that include choosing appropriate quantity of food, combinations of food, cooking methods, storage, eating atmosphere, hygiene and eating etiquettes. Following eight factors related to consumption of food need to be considered:

1. **Nature (*prakrti*)** – Not all the food articles are suitable for everybody. In fact the suitability of the food articles is dependent on the psychosomatic constitution of the individual. Hence it is necessary that one should always consider the original nature of the food article in the light of his psychosomatic constitution while consuming the food. In diseased state the status of the *dosa* and effect of the food on them need to be considered.
2. **Process of preparation (*samskāra*)** - The method of processing like frying, roasting etc have a definite effect on the nature of prepared food. The processed food will have different characteristics than the original food. Appropriate processing technique can make the food suitable for the consumer in accordance with the requirements.
3. **Compatibility (*samyoga*)** – Food articles when used in combinations may either be useful or harmful. Combination of food material having opposite properties may prove harmful to the consumer. Illustrations of such harmful combinations are given in the Ayurvedic texts (*Viruddhahārā*). The consumer should always avoid such harmful food combinations.
4. **Quantity (*rasi*)** – The quantity of food as a whole or item wise need to be considered. Light food also if consumed in excess is likely to be harmful. Heavy foods should always be consumed in small quantity. In this reference the stomach is considered to be divided into four parts. Out of these two parts have to be filled with solids and one part with liquids. The remaining one part should always be left empty.
5. **Habitat (*desa*)** - Habitat is geographic region. Specific food is either suitable or not suitable according to variations in the climatic condition of the area.
6. **Time (*kāla*)** - Eating schedules need to be observed every time one takes food. Consumption of food at odd hours is detrimental to the health. Seasonal variations also need to be considered while selecting food materials.

**7. Rules of eating (*upayoga samsthā*)** - There are certain dietetic rules, which need to be followed by one and all. This ensures proper digestion and metabolism.

**8. Consumer (*upayokta*):** The consumer should observe all disciplines of dietetics. Quality, quantity, processing, combinations of the food and consideration of digestive capacity, health status, age, season are important factors to be considered.

Observation of above stated guidelines plays a significant role in promotion of health and prevention of disease.

**3.1.3 Diet and Mind** - Considering the effect of food on mind, following 3 classifications have been made:

1. **Sāttvika food-** Ideal diet containing vegetarian, non-oily, non-spicy food articles which are congenial to the mind.
2. **Rājasika food-** Too spicy, hot, sour, salty that excites the mind.
3. **Tāmasika food-** Too oily, tasteless, putrefied, stale and heavy food that leads to lethargic mind.

Along with a balanced diet, incorporating other healthy habits into a daily routine can prevent disease at its root level.

## 3.2 Lifestyle (*Vihāra*)

**3.2.1 *Svasthavrta* (lifestyle advocacy for maintenance of health)** - *Svasthavrta* is a healthy life style, prescribed for the maintenance of health of an individual. Health preventive measures include diet, practices and regimen during day (*dinacaryā*), night (*rātricarya*), different seasons (*rtucaryā*) and code of conduct (*sadvṛtta*). Seasonal and appropriate use of *pañcakarma* and *rasāyana* are also important in the prevention of the diseases.

### 3.2.2 *Dinacaryā* (daily regimen)

Researchers in medical chrono-biology have long discovered that our body has many inbuilt rhythms or cycles. Most of our body functions follow a daily cycle. Our weight fluctuates during the day and is the maximum in the evening. Our body temperature is highest in the evening and most of our hormones have their well defined periods of high and low secretions during the day and the most obvious of all is the sleep – wake cycle. Therefore intrinsically the emphasis of Ayurveda is on natural cycles. *Dinacaryā* meaning the daily regimen refers to

a healthy and sustainable pattern of lifestyle. In order to be optimally healthy, one should tune the body to the nature's master cycle which in turn regulates the various other rhythms. To achieve this, Ayurveda prescribes a specific routine in general and also on the basis of psychosomatic constitution of an individual. This includes waking up early in the morning, excretion of bio-wastes, taking care of oral hygiene (cleaning of teeth and tongue, gargling), exercise, massage, bath, clothing, sleep, eye care, nasal therapy etc. The various aspects of this daily routine in general are:

**Waking up-** Since our biological clock is tuned to the rising and setting of the sun, it is advisable to wake up before the sunrise in perfect synchronization to the natural clock. An ideal time to wake up is *brahmamuhūrta* (1-2 hours before sunrise).

**Natural Urges-** Dawn is the best time to eliminate the body's physical waste. Drinking one or two glass of warm water in winter season and normal water in other seasons before sunrise helps in proper elimination of *mala* and renders multiple health benefits.

**Oral Hygiene-** Brushing of teeth and cleaning the gums are advised early in the morning and after each meal by using the twigs/thin stems of different plants like *Neem* (*Azadirachta indica*), *Khadira* (*Acacia catechu*) etc. Scrapping the tongue using tongue cleaners made up of metals or plants are advised. The gargling with water, decoctions and medicated oils keeps gum, mouth, teeth and throat healthy.

**Exercise-** Exercise increases the body's stamina and resistance to disease by facilitating the immune system, clearing all channels, promoting circulation & waste disposal and destroying fat. Exercises may be in the form of yoga or walking etc. Depending on age and body type, *kapha* type can go for heavy exercises, *pitta* type should do it in moderation and *vāta* type should perform light exercises. Exercise should not be done during illness and just after meal.

**Massage-** The gentle oil massage everyday makes the skin supple; controls *vāta* by reducing its cold, dry, light, rough and erratic qualities; enhances blood circulation; encourages elimination of metabolic wastes and relaxes the body.

**Bathing-** Warm bath is advisable for the body and cold water for the head.

**Clothing-** Clothing should always be clean, light and made of natural fibers as cotton, wool or silk. The use of natural perfumes in moderation promotes pleasant feeling.

**Sleep-** Night is the natural time to sleep and day sleep is contraindicated except for the very young, old, very weak and those intoxicated, diseased, exhausted or traumatized and who could not have sufficient sleep during night. The person with disturbed sleep should massage the feet with oil before going to bed.

**Brahmacarya** - In the broad sense it means control of the senses or *indriya* especially sexual life. More specifically, it refers to celibacy or chastity. Like all traditional spiritual traditions, Ayurveda advocates restraining from indulging in sensual gratification. The more broad definition of *brahmacharya* also includes conduct that leads to the realization of the self. The conservation of energy that comes from practicing celibacy is converted into *ojas*. Many people mistakenly believe that practicing *brahmacharya* means suppression of the natural urge but on the contrary anything that is suppressed will eventually lead to disorder.

**Eye care-** Washing the eyes every morning with clean and cold water or decoction of *triphalā* is very useful. Use of a medicated collyrium (*sauvīrāñjana*) every day is also recommended for the healthy eyes.

**Nasya** (nasal instillations) - Regular inhalation of the *Anu taila*, the oil prepared by boiling 26 different medicinal plants in gingelly oil and goat's milk prevents all ailments of the eyes, hair, nose and the ears.

**3.2.3 *Adhāraṇīya Vega* (non suppressible natural urges)** - There are thirteen natural urges, suppression of which leads to many diseases as given below:

1. Suppression of urge of urination may lead to difficulty in passing urine, urinary stone, atony of bladder and inflammation of urinary tract.
2. Suppression of bowel movement may lead to pain in abdomen, indigestion, gas in abdomen, headache.
3. Suppression of flow of flatus may lead to pain in abdomen, indigestion, heart diseases, constipation or diarrhoea.
4. Suppression of flow of semen may produce pain in testis and difficulty in intercourse.
5. Suppression of urge for vomiting may lead to different types of diseases like urticaria, giddiness, anaemia, hyperacidity, skin diseases and fever.
6. Suppression of sneezing may produce rhinitis and chronic cold, headache, sinusitis and diseases of respiratory system.

7. Suppression of eructation may lead to hiccough, pain in chest, cough and loss of appetite.
8. Suppression of yawning may lead to diseases of the eyes, throat, ear and nose.
9. Suppression of hunger may lead to indigestion, nutritional disorders and debility.
10. Suppression of thirst may lead to nutritional disorders and debility.
11. Suppression of tears may lead to mental disorders, pain in chest, giddiness and digestive disorders.
12. Suppression of respiration after exertion may cause suffocation, respiratory disorders, heart diseases and even death.
13. Suppression of sleep may cause diseases like insomnia, mental disorders, digestive disorders and diseases of sense organs.

**3.2.4 *Dhāraṇīya vega* (suppressible natural urges)** - Apart from 13 non-suppressible natural urges mentioned above, Ayurveda describes some suppressible natural urges. One should control the urges of greed, envy, hatred, jealousy, lust etc. and gain control over the worldly pleasures.

### **3.2.5 *Rtucaryā* (Seasonal Regimen)**

According to Ayurveda the *dosa* and the *rtu* (seasons) are interlinked. Health is affected by the nature of the climate as outer environment influences the body. For example, when the air is damp, cold and wet it increases these qualities in the body leading to aggravation of *kapha*, which has similar qualities. Hence there is an increase in mucous, catarrh and colds in winter. There are various environmental factors like temperature, humidity, wind, rain, clouds and atmospheric pressure and sunlight etc. that affect individual's health. *Rtucaryā* is the observance of diet and regimen according to the seasonal changes. In Ayurveda, a year is divided into two *kāla* (cycles) or periods based on the apparent position of the sun in the north and southern directions. They are:

1. *Uttarāyana* - Northern solstice
2. *Dakṣināyana* - Southern solstice

*Uttarāyana* is also called *ādanakāla* or the taking away period. The sun and wind are powerful during this period. The energy of the body is diminished. Due to the heat, air becomes hot and drains the cooling effect of earth. Due to this, people get dehydrated and weakened and the atmosphere becomes hot and dry.

### Chapter 3: Lifestyle Management

*Dakṣināyana* is also called *visargakāla* or the giving away period. The moon becomes powerful during this period. The earth cools down due to cold winds and rain. People regain their strength and nourishment that was lost in the *ādanakāla*.

Each year consists of six *ṛtu* or seasons. Each *ṛtu* comprises of two months and three such *ṛtu* constitute one *kāla*. Hence, *ādānakala* and *visargakāla* each comprises of six months and three *ṛtu*. The six *ṛtu* and their characteristics are summarized below in the table:

Kāla (Semester)	Rtu (Season)	Month	Characteristics
<i>Ādāna</i> ( <i>Uttarāyana</i> )	<i>Śīśira</i>	Mid January to mid March	Winter and spring
	<i>Vasanta</i>	Mid March to mid May	Spring
	<i>Grīṣma</i>	Mid May to mid July	Summer
<i>Visarga</i> ( <i>Dakṣināyana</i> )	<i>Varsā</i>	Mid July to mid September	Rainy Season
	<i>Śarad</i>	Mid September to mid November	Autumn
	<i>Hemanta</i>	Mid November to mid January	Dewy season

This classification is based on Indian climate. This may differ from area to area where mainly three seasons namely summer, rainy and winter occur.

#### Seasonal diet and lifestyle

##### ***Hemanta Rtu* (dewy season )**

##### ***Śīśira Rtu* (winter and spring)**

In both these seasons the *agni* becomes more powerful. *Vāyu* is accentuated and needs to be pacified by comparatively heavy diet.

Diet	Lifestyle
<ul style="list-style-type: none"> <li>Intake of food with sweet, sour and salt taste helps pacifying the <i>vāta</i></li> <li>Wine prepared from <i>jaggery</i> (molasses) can be taken</li> <li>Wheat/gram flour products, milk products, sugarcane products and corn/edible oils can be taken as a part of food</li> </ul>	<ul style="list-style-type: none"> <li><i>Abhyanga</i>- Massage with oil followed by steam bath</li> <li>Dry body massage (<i>Udavartana</i>)</li> <li>Exercise.</li> <li>Clothing-leather, silk and wool.</li> <li>Exposure to sunlight and heat to keep oneself warm.</li> </ul>

<ul style="list-style-type: none"> <li>• Carrots, tomatoes, figs, dates, cane sugar, nuts to be taken</li> <li>• Warm water should be taken as it aids digestion</li> <li>• Bitter, astringent and pungent food must be avoided</li> </ul>	<ul style="list-style-type: none"> <li>• Right time for having sexual pleasure</li> </ul>
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### **Vasanta Rtu (spring)**

During *vasanta rtu*, increased *kapha* liquefied by the heat of sun causes diminished *agni*

<ul style="list-style-type: none"> <li>• Take easily digestible food. Barley, honey, roasted meat, mango juice.</li> <li>• Beverages such as <i>āsava - arīṣṭa</i> (Medicated fermented preparations), <i>śidhu</i> (fermented sugarcane juice), honey mixed with water and water boiled with extracts of sandal wood.</li> <li>• Avoid food that is heavy to digest, cold, sour, sweet and fatty. Such food increase <i>kapha</i> causing <i>dosa</i> imbalance and hence genesis of disease.</li> </ul>	<ul style="list-style-type: none"> <li>• Vigorous physical exercise.</li> <li>• Dry massage.</li> <li>• Nasal instillation can be done after massage and bath with camphor, sandalwood and saffron</li> <li>• Avoid sleep during the day</li> </ul>
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### **Grīṣma Rtu ( summer)**

*Grīṣma rtu* is the season of dehydration, exhaustion, lack of energy and lethargy. During summer, there occurs decrease of *kapha* due to the heat of the sun and dryness in the air.

<ul style="list-style-type: none"> <li>• Sweet, light, fatty and liquid food can be taken.</li> <li>• Boiled rice with meat, corn flour, buttermilk (yoghurt) can be taken in food.</li> <li>• Drink cold water from clay pot.</li> <li>• Syrup prepared with grapes, sugarcane, resin, dates, <i>kāśmarya</i> (<i>Gmelina arborea</i>) and <i>paruṣaka</i> (<i>Phoenix pusilla</i>) fruits all in equal quantity cold with cardamom powder.</li> <li>• Fresh juices and juicy fruits, salads, buttermilk can be taken in abundance.</li> </ul>	<ul style="list-style-type: none"> <li>• Anoint body with sandal wood paste and take bath with cold water.</li> <li>• Stay in cool places.</li> <li>• Wear loose and light cotton dresses to keep the body cool.</li> <li>• Use perfumes made from substances that possess cold properties</li> <li>• Sleep during day is permitted as nights are short.</li> <li>• Too much exertion and sunshine should be avoided</li> </ul>
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### **Varṣā Rtu ( rainy season)**

The *agni* weakens further and gets vitiated by *vāta*. Lack of sunshine as well as a cloudy atmosphere is non-congenial to health.

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| <ul style="list-style-type: none"> <li>● Easily digestible food such as pulses, juice, soups, old grains and <i>mastu</i> (watery portion of yoghurt) can be taken in food.</li> <li>● Ginger, black pepper and lemon juice may be taken to reinforce appetite.</li> <li>● Leafy vegetables should be taken sparingly.</li> <li>● Foods should be hot and light with ghee, curd and honey.</li> <li>● Should be careful about water contaminated with rain.</li> </ul> | <ul style="list-style-type: none"> <li>● <i>Pañcakarma</i> can be done.</li> <li>● Perfumes can be used.</li> <li>● Avoid sleep in during daytime.</li> <li>● Avoid exertion and too much exposure to sunlight.</li> </ul> |
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### **Śarad Rtu ( Autumn Season )**

The damp and hot atmosphere aggravates *pitta*. Sudden exposure to sunlight after the rains and cool atmosphere increases *pitta*.

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|--|--|
| <ul style="list-style-type: none"> <li>● Ghee processed with bitter herbs can be taken.</li> <li>● Intake of bitter, astringent and sweet taste food items is useful.</li> <li>● Take easily digestible food like rice, green gram, Indian gooseberry, honey and sugar.</li> <li>● Avoid heavy food, curd, oil, strong liquors.</li> </ul> | <ul style="list-style-type: none"> <li>● <i>Udavartana</i> with <i>candana</i>.</li> <li>● Bath with warm water.</li> <li>● Pearls give soothing effect from aggravated <i>pitta</i>.</li> <li>● Avoid direct exposure to breeze, liquor and sleep during day</li> </ul> |
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**Rtusandhi and its significance-** *Sandhi* means conjunction. *Rtusandhi* is the period of the last 7 days of the preceding season and the first seven days of forthcoming season. During *rtusandhi*, the diet and regimen that is being followed should be given up gradually and that of the subsequent season *may* be taken up similarly.

### 3.2.6 **Sadvṛtta** (code of conduct)

The foundation of Ayurveda lies in its basic principle that accepts the holistic nature and the integrity of body, mind, and soul. A healthy mind is as important as a healthy body. This ethical regimen contains principles of right conduct that are applicable to all; irrespective of caste, creed and religion. Practice of code of conduct helps to keep the body and mind in a balanced condition. Emphasis is given on righteous and truthful behavior, possession of high moral, abstinence from greed, hatred, passion and envy in this code of conduct. Discipline in (1) *āhāra* (food), (2) *nidrā* (sleep) (3) *brahmacharya* (celibacy) called *trayopastambha* are basis of fruitful life and good health.

Thus *dinacaryā*, *ṛtucaryā* and *sadvṛtta* form the basis of healthy living.

**Note to the readers:** The readers may obtain more information from the books, journals and websites mentioned in the concerned section of the document such as:

1. Agnivesa. Caraka Saṃhitā English translation by Dash Bhagwan, Sharma RK. Varanasi, India: Chaukhamba Publications, 2<sup>nd</sup> Edition, 2000.
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## Chapter 4

### DRUGS

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#### 4.1 Principles of Drug Action

Ayurveda considers drug as a very important patient management tool in the hands of a medical practitioner. According to the principles of Ayurveda, there is not a single substance in the Universe which does not have a potential to be used as a medicine. Around 6000 species of medicinal plants are documented in published medical and ethno-botanical literatures in India. Ayurveda takes into account the action of the drug in its entirety. It holds that the action of the whole drug is often different from that of any one of its constituents considered separately. A section called *dravyaguṇa vijñāna* is the description of crude drugs used in therapeutics.

Pharmaco-dynamics of drugs in Ayurveda is described on the basis of *rasa* the taste, *guna* the therapeutic property, *virya* the potency, *vipāka* and *prabhāva* the specific therapeutic action. These five factors are responsible for the drug action.

**4.1.1 Rasa-** Six types of perceptible tastes are described in Ayurveda. They are *madhura* (sweet), *amla* (sour), *lavana* (salty), *kaṭu* (pungent), *tikta* (bitter) and *kaṣāya* (astringent). The actions of the drugs are basically described in accordance with the effect of drug on *dosa* as every taste is associated with a specific action on *dosa*. The sweet, sour and salty tastes are unctuous in nature and hence promote *kapha* and pacify *vāta dosa*. The pungent, bitter and astringent drugs are dry in nature and promote *vāta* and pacify *kapha*. The astringent, bitter and sweet drugs cause pacification of *pitta*.

**4.1.2 Guna-** The *guna* is physical property of the drug described in Ayurveda, which is related to the therapeutic action of the drug. There are ten pairs of *guna* which are as follows: *guru* (heavy) - *laghu* (light), *śīta* (cold) - *ūṣṇa* (hot), *snigdha* (unctuous) - *rukṣa* (rough), *manda* (dull) - *tiksṇa* (sharp), *sthira* (immobile) - *sara* (mobile), *mrdu* (soft) - *kathina* (hard), *viśada* (non-slimy) - *picchila* (slimy), *slaksṇa* (smooth) - *khara* (rough), *sūksma* (fine) - *sthūla* (gross), *sāndra* (solid) - *drava* (liquid).

**4.1.3 *Vīrya*-** *Vīrya* is the strength or potency responsible for the action of the drug. It is essentially the biological property which needs to be protected and preserved in a drug. It is also mentioned that every action of a drug is controlled by *vīrya* viz. *sīta vīrya* and *ūṣṇa vīrya*.

**4.1.4 *Vipāka*-** The end product of digestion and metabolism of a drug which is responsible for the action is *vipāka*. *Vipāka* is not perceived directly like taste but is inferred from its effects on *dosa*, *dhātu* and *mala*. The three major types of *vipāka* are *madhura*, *amla* and *katu*. The *madhura*, *amla* and *katu* *vipāka* drugs promote *kapha*, *pitta* and *vāta dosa* respectively.

**4.1.5 *Prabhāva*:** *Prabhāva* is a specific action of drug which cannot be explained on the basis of its *rasa*, *guna*, *vīrya* or *vipāka*. In other words, this action is not related to any of the *rasapañcaka*.

Apart from the description above, different other types of drug actions are enlisted in Ayurveda but those actions are related to one of the *rasapañcaka* mentioned above.

## 4.2 Pharmaceutics

Substances distributed in the universe are derived from plants, animals or minerals, which also serve as the drug sources. These sources cannot be used as a drug in their natural form. Hence almost every substance has to undergo a specific processing to acquire the form of a drug. Such processing is termed as *bhaiṣajya kalpanā* (pharmaceutics) in Ayurveda. The form which ultimately comes into use by the patient is termed as a drug delivery system or drug dosage form. Safety, efficacy, stability and palatability are the four basic requirements of a good drug dosage form. Ayurveda gives prime importance to these four basic requirements. The pharmaceutical procedures for any drug involve various steps starting from identification and collection of authentic raw material, application of standardized processing techniques and production of quality drug to packaging and storage of the finished drug.

In Ayurveda both single drug and compound formulations are used for therapeutic purposes. Initially five dosage forms (*Pañcavidha kaṣāya kalpanā*) viz. *svarasa* (expressed juice), *kalka* (paste), *kvātha* (decoction) *hima* (cold infusion) and *phāṇṭa* (hot infusion) were formulated. All these were meant for immediate use due to their short shelf life. To increase the shelf life of the drug, the preparations with more stability viz. *vati*, (tablet), *guti* (pill), *taila* and *ghṛta* (medicated oil/ghee) were introduced later. Some preparations with food articles fortified with

## Chapter 4: Drugs

medicines like *lehya* (linctus) were also made to have the acceptability of sensitive patients having aversion to the medicines. Other commonly used Ayurvedic dosage forms are *cūrṇa* (powder), *arka* (distillate), *kṣāra* (acrid substance), *āsava-* *ariṣṭa* (medicated fermented preparations) and *parpatī* (medicinal flakes). The details of dietetic preparations such as various types of gruels, soup is also available. Different drug delivery systems were taken into consideration while designing new dosage forms like ointment/ cream, syrup, granules, capsules, candy etc.

In Ayurvedic therapeutics, fresh as well as dried plant materials are used for processing depending on availability and necessity. These drugs are used singly or in simple combinations. It is necessary that the form of the drugs or formulations when ready for ingestion are only effective but also easy to administer and acceptable to the patient. The main emphasis is on removing the physical and chemical impurities, contaminants and undesired constituents from the crude drugs. To meet this requirement basic materials are sometimes subjected to purifying process known as *śodhana*. Utmost importance has been given to the quality of raw ingredients. Proper season for collection and part of the plant to be used has also been emphasized.

The type of pharmaceutical processing depends mainly on following factors:

1. Nature of the raw material; fresh or dry
2. Required quantity of the dosage form
3. Solubility of therapeutically useful component of the plant
4. Heat stability of therapeutically useful component of the plant
5. Route of administration
6. Acceptability by the consumer
7. Shelf life of prepared dosage form

### 4.2.1 Processing of metal and mineral products

It was known to ancient Ayurvedic scholars that metals and minerals are toxic and harmful to the body. Such harmful and toxic effects of inappropriately processed metals and minerals have been described in Ayurvedic classics. However Ayurvedic scientists believed that if properly processed, metals and minerals can be successfully put to therapeutic use. On this background intensive and elaborate processing techniques were evolved to make the mineral and metal substances fit for therapeutic utilization. The ultimate object of such a processing is

to produce a drug which easily assimilates in the human body without producing harm in therapeutically effective dose. Thus metals like the gold, silver, copper, iron, lead, tin and mercury are processed in such a way that they are safe and effective. Furthermore they are instantly effective in very small doses in a wide variety of diseased conditions.

It is to be noted that the metal and mineral based preparations mentioned in Ayurvedic classics are safe and efficacious. Several studies carried out over the years and many recent studies show that toxicity is not normally observed at the therapeutic dose level if used in an appropriate manner. Few examples proving the efficacy of metal and mineral based Ayurvedic drugs are:

- *Svarna bhasma* (calcined gold) is reported to possess analgesic, immune-modulation, anti-oxidant effects especially in ischemic conditions and anti-arthritis effects in experimental animals.
- *Tāmra bhasma* (calcined copper) has been reported to possess hepato-protective, anti-oxidant and anti-ulcer effects.
- *Abhraka bhasma* (calcined mica) is reported to possess hepato-protective, anabolic and immune-modulation effect.
- Herbo-mineral formulations containing *śaṅkha bhasma* (calcined conch) is reported to have anti-duodenal ulcer effect in rats.
- *Jaśada bhasma* (calcined zinc) has been evaluated for possible myopia arresting effect and is reported to have produced potentiation of hypoglycemic effect of tolbutamide.
- Hepato-protective activity has been reported with *māṇḍūra bhasma* (calcined iron). *Karpūra śilājatu bhasma*, an Ayurvedic herbo-mineral formulation was found to possess diuretic effect.
- Genotoxicity studies on four preparations - *Rasa manikya*, *lauha bhasma*, *tāmra bhasma* and *kajjali* employing micronucleus and comet assays showed them to be devoid of genotoxicity.

### 4.3 Drug Manufacture

Ayurveda practitioners usually prefer to prepare medicines required for treating their patients. However, today quality Ayurvedic drugs are being manufactured on large scale by Ayurvedic drug industry by using sophisticated facilities. A vast range of Ayurvedic drug formulations in different dosage forms are produced. Currently, two categories of medicines are manufactured

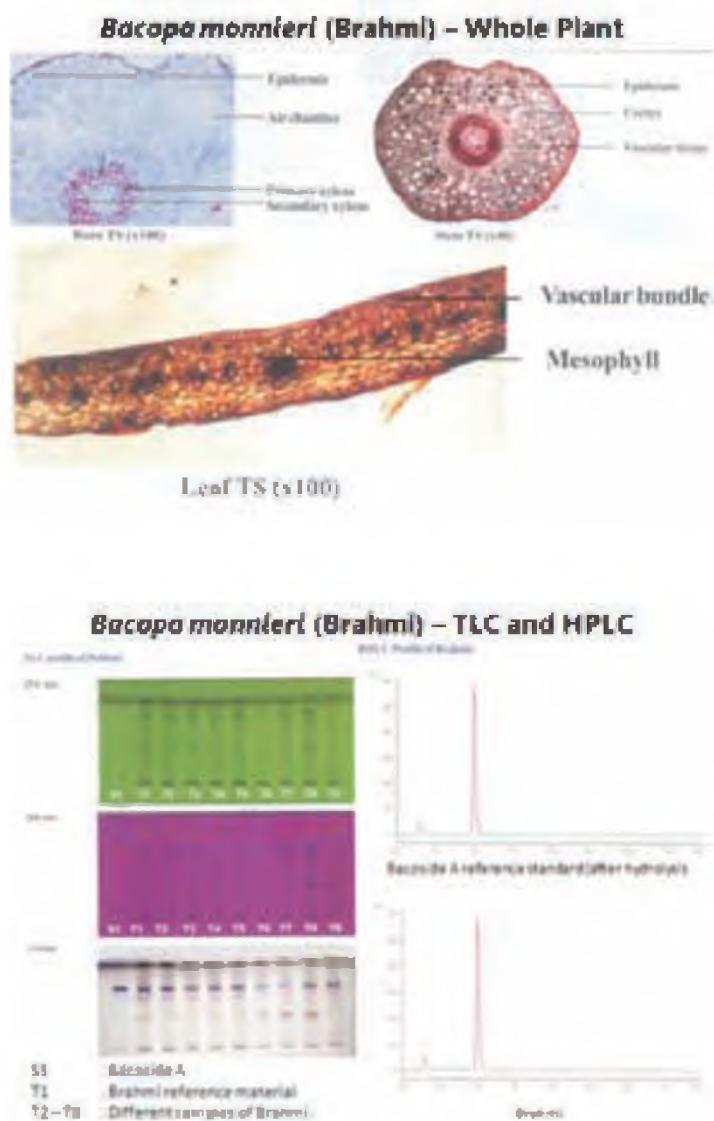
## **Chapter 4: Drugs**

and sold in the market - 1) classical preparations that are manufactured exclusively in accordance with the formulae described in the specified authoritative books of Ayurveda, 2) patent and proprietary medicines are the new combinations. The medicine may contain processed single plant but majority are the combination of different ingredients to produce synergistic effect. There are around 8000 licensed manufacturing units in India. Compliance to Good Manufacturing Practices (GMP) is made mandatory for all manufacturing units.

A cultivation programme for medicinal plants is implemented to ensure optimal yield in terms of both quality and quantity of any medicinal plant under the guidelines for Good Agricultural Practices (GAP). These guidelines put forth a standard for production of raw material that goes in to the making of the ASU medicines. It also ensures standardization of the production processes from farm to factory. To ensure cultivation and supply of quality plant material for ASU (Ayurveda, Siddha, Unani) drug industry, National Medicinal Plants Board has been established. The NMPB is ensuring conservation of medicinal plants, gene pools as well as promoting cultivation of species of high trade value and establishment of medicinal plants processing zones. It is also promoting strengthening of regulatory mechanism for ensuring quality control, R&D and processing technology involving accredited laboratories in the government and non-government sector.

### **4.4 Standardization and quality control**

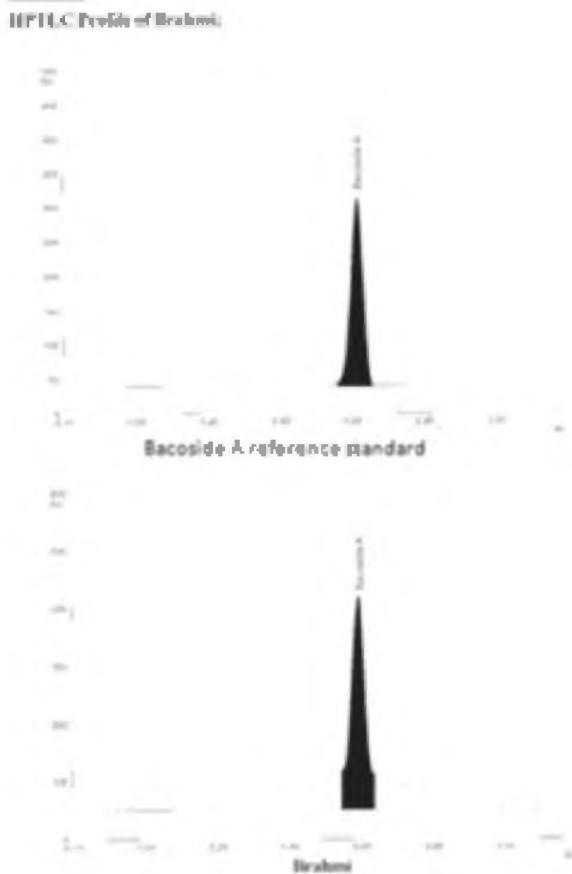
Efforts to monitor quality and regulating the growing business of herbal drugs and traditional medicine are being made globally. Sensing the need, Government of India has also formulated some regulations in this sector. Good Manufacturing Practices under Schedule 'T' of the Drugs and Cosmetics Act 1940 has been notified by Government of India to ensure and enhance the quality of ASU medicines. It also ensures that raw materials used in the manufacture of drugs are authentic, of prescribed quality and are free from contamination. Drugs and Cosmetics Act, 1940 has been formulated by Government of India for manufacturing for marketing of the drugs. For the implementation of Drugs and Cosmetics Act 1940 and Rules 1945 Scientific quality standards of drugs are laid down in Ayurvedic Pharmacopeia.



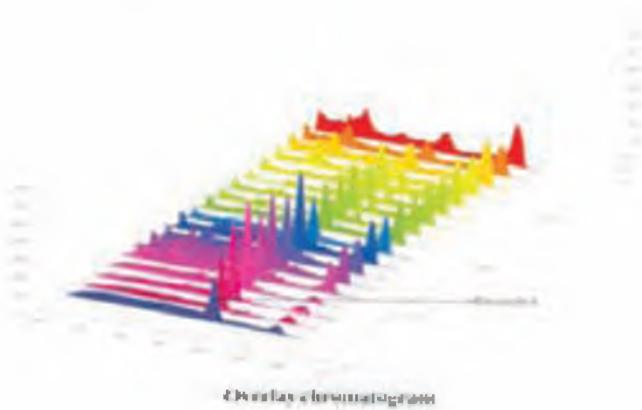
**Fig. 8- Pharmacognostical standards of *Bacopa monnieri***

(Source: Quality Assessment of Selected Indian Medicinal Plants; A joint publication of National Medicinal Plants Board, Department of AYUSH & Natural Remedies Pvt. Ltd; Bangalore, India)

## Chapter 4: Drugs



*Bacopa monnieri (Brahmi)-HPTLC*



**Fig. 9- HPTLC of *Bacopa monnieri***

(Source: Quality Assessment of Selected Indian Medicinal Plants; A joint publication of National Medicinal Plants Board, Department of AYUSH & Natural Remedies Pvt. Ltd; Bangalore, India)

The Government of India has set up the Ayurvedic Pharmacopoeial Committee (APC) in 1962 to prescribe standards of single drugs and compound formulations mentioned in Ayurveda for the use of manufacturers.

The functions of APC are:

1. To prepare Ayurvedic Pharmacopoeia of India (API) of single drugs (Part I) and compound formulations (Part II).
2. To prescribe the working standards for raw materials as well as compound formulations including tests for identity, purity, strength and quality so as to ensure uniformity of the finished formulations.
3. To develop and standardize method of preparations, dosage forms, toxicity profile etc. of formulations.
4. To provide all other information on Ayurvedic formulations regarding the distinguishing characteristics, methods of preparation, dosage, method of administration with various anupāna or vehicles and their toxicity.
5. To develop the quality standards, safety, efficacy profile of different parts of the plants; as well as inclusion of new plants as Ayurvedic drugs.
6. Any other matter relating to the quality standards, shelf life, identification, new formulations etc.
7. To develop quality standards, safety, efficacy profile of Intermediates like extracts of plant drugs used in Ayurveda.

Publication of Ayurvedic formularies and pharmacopoeia containing monographs of Ayurvedic formulations is an ongoing process by Government of India. These monographs record macroscopic description of the drug and microscopic tissue structures. Furthermore the monographs give norms and limits of identity, purity and strength with respect to tolerance of foreign matter, total ash, acid insoluble ash, water and alcohol soluble extractive etc. Three volumes of Ayurvedic formulary on India containing details of about 900 compound formulations have been published. The monographs of 600 single drugs and 152 classical compound formulations have been included in multiple volumes of Ayurvedic pharmacopeia of India.

## **Chapter 4: Drugs**

**Note to the readers:** The readers may obtain more information from the books, journals and websites mentioned in the concerned section of the document such as:

1. Savrikar SS, Ravishankar B. Bhaishajya Kalpana - The Ayurvedic Pharmaceutics - An Overview. Afr J Tradit Complement Altern Med. 7(3): 174–184. 2010.
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## Chapter 5

### Therapeutic Approaches

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Ideal treatment according to Ayurveda is one which cures the disease without causing complications. The three classical therapeutic modes advocated by Ayurveda are (1) *daivavyapāśraya cikitsā* (spiritual therapy) (2) *yuktivyapāśraya cikitsā* (rational treatment) and (3) *sattvāvajaya cikitsā* (psycho-behavioral therapy). The Ayurvedic treatment methods can be grossly divided into three methods *saṃśodhana* (bio-cleansing therapy), *saṃśamana* (palliative therapy) and *nidāna parivarjana* (avoidance of causative factors). *Anupāna* is usually water, honey, ghee, jaggery, milk, butter milk and herbal decoction, which is given along with main drug to help in absorption and drug delivery to the target organ in the body. *Bhesaja kāla* exemplifies the administration of medicines with regard to specific time and frequency in the management of disease. It decides the extent and rate of its digestion, absorption, biotransformation and excretion. The type of therapy to be administered to the patient is planned out on the basis of stage of disease and state of patient which are ascertained by using manifold methods of examination. The due importance is given for a thorough clinical examination and proper understanding of the disease before planning for a treatment. Different principles like *satkriyākāla*, *nidāna pañcaka* are employed for this purpose.

### Specialized Therapeutic Procedures

Ayurveda advocates preventive and curative therapies along with specialized techniques of *pañcakarma* (purification) and *rasāyana* (rejuvenation). Various scientific studies and clinical experiences have validated the efficacy and acceptability of these procedures.

#### 5.1 *Pañcakarma*

*Pañcakarma* literally means "five types of bio-cleansing therapies". These five therapies of eliminating toxins from the body are *vamana* (therapeutic induction of vomiting), *virecana* (therapeutic induction of purgation), *śirovirecana/nasya* (nasal instillations), *nirūha basti* (therapeutic enema predominantly with medicated decoctions) and *anuvāsana basti* (therapeutic enema with medicated oils) according to Ātreya school and considering both types of *basti* as one, Dhanvantari school of thought mentions *raktamokṣaṇa* (bloodletting) as a

procedure of *pañcakarma*. This five fold therapy is aimed at *sodhana* i.e., the eradication of the basic cause of disease and later to achieve *śamana*, mitigation of the disease.

*Pañcakarma* is essentially applicable in a wide range of preventive, curative and promotive conditions. These therapies are advocated even in a healthy person to combat seasonal imbalance of *dosa*. Ayurveda quotes that the disorders treated with this mode of therapy do not recur while those treated with palliative methods do have ample chances of recurrence. These measures are preceded by *snehana* (internal or external administration of medicated oils or fats), *svedana* (induction of sweating) and followed by *samsarjana karma* (restorative regimen after *pañcakarma*).

*Vamana* has been claimed as the best treatment for diseases of *kapha*, *virecana* for diseases of *pitta* and *basti* for diseases of *vāta*. Classically *pañcakarma* therapy is prescribed and practiced through following schedule viz. (1) *pūrva karma* (preparatory procedures), (2) *pradhāna karma* (main procedures) and (3) *paścāt karma* (post procedure measures).

### 5.1.1 *Pūrva karma*

Before the administration of *pañcakarma* therapy, the patient is prepared suitably with *snehana* and *svedana* as preparatory measures. *Pañcakarma* therapy should not be undertaken without *pūrva karma* as it otherwise fails to eliminate the *dosa* located in the tissues. The administration of oil/fat in *snehana* renders the body soft, liquefies *dosa* so that they become amenable to disintegration and detachment from the tissues. *Svedana* therapy dislodges the vitiated *dosa* stagnated in the subtle channels of circulation thus facilitating the *pradhāna karma* to easily eliminate the *dosa* through respective pathways. Some times *snehana* and *svedana* are also used as independent therapies.

- i. ***Snehana:*** Administration of mostly medicated preparations containing oil, ghee or fat to a patient for a limited period to get the desired clinical effect is called *snehana*. *Sneha* pacifies abnormal *vāta*, renders the body soft and clears the accumulated wastes which have obstructed the body channels. Further, the regular and rational use of fats has been considered beneficial for the proper digestion, cleansing of the bowel, the promotion of body strength and integrity of senses besides several other beneficial effects of oleation. Oil, ghee or fat based preparations can be administered through different kinds of foods, massage etc. according to the feasibility. The ghee or oil may either be used singly or in medicated form or may be mixed with other drugs.

- ii. **Svedana:** Making a person to perspire, with or without using heat generated by fire is called *svedana*. Generally the *svedana* should be undertaken after *snehana* therapy. It is considered that the sweating dissolves the waste products of metabolism, stagnated in the body channels which have been softened by *snehana* therapy. Two types of measures are employed for sweating, (1) by using heat generated through fire (*sāgni sveda*) and (2) without use of fire (*niragni sveda*) i.e. by exposure to sun, physical exercise, staying in a closed room, administration of different kinds of alcoholic beverages, covering the body with thick clothes, walking etc. Care should be taken while performing *svedana* at certain parts of the body such as eyes, testis and pre-cordial region.

### **5.1.2 Pradhana Karma**

After preparing the patient with *snehana* and *svedana* the patient is subjected to the main measures of *pañcakarma* - *vamana*, *virecana*, *nasya*, *basti* and *raktamokṣana* as per requirement.

- i. **Vamana:** The therapeutic procedure of eliminating morbid *kapha* through the oral route is called as *vamana*. It is the therapy of choice in diseases of *kapha* predominance. It is specially indicated in cough, cold, bronchial asthma, elephantiasis, diabetes mellitus, nausea, diarrhoea, loss of appetite, poisoning, stomatitis, anemia, mental diseases, epilepsy, psoriasis, erysipelas, lymphadenopathy etc. Emesis therapy is contraindicated in children, very old, debilitated and also injuries of lungs, sprue, bleeding, anuria, enlargement of spleen, abdominal tumors and some abdominal diseases etc. Subjective feeling of clarity of the heart, chest, head etc., lightness in the body, timely passing of urine, stool etc. are the features of well administered emesis therapy.
- ii. **Virecana:** *Virecana* therapy is induction of purgation for the management of *pitta dosa* predominate disorders. Purgation therapy is indicated in diseases of skin, fever, diabetes mellitus, diseases of gastrointestinal tract, abdominal tumor, enlargement of spleen, helmentiasis, erysipelas, gout, reproductive diseases, fistula-in-ano, glandular swelling, anemia, jaundice, loss of appetite etc. It is contraindicated in children and old patients and also in pregnancy, fever of recent origin, indigestion, lymphadenitis, debility, diarrhea etc. Feeling of cleanliness in the channels and sense organs, lightness in the body, increase of appetite etc. are the symptoms of well administered *virecana*.

- iii. **Basti:** Medication administered through anal route to get desired therapeutic effects is known as *basti*. According to Ayurveda *vāta* is the main factor in the causation of many diseases and *basti* therapy is the best treatment for deranged *vāta*. This therapy is also very useful as a health promoting measure. It is beneficial for old as well as for the young and there are no notable hazards in this therapy. It is helpful in all kinds of diseases due to its varied pharmaco-dynamics and kinds of drugs used in its preparations. *Basti* can be classified mainly into two types viz. *anuvāsana basti* and *nirūha basti* which are mentioned as separate procedures of *pañcakarma* in *Caraka Samhitā*. These two types of *basti* are given in specified schedule. *Nirūha basti* is always preceded and succeeded by *anuvāsana basti* for proper elimination of morbid *vāta* without causing any complications.
- iv. **Sirovirecana:** Also called *nasya* is a procedure by which drug (oil, liquids, fumes or powders etc.) is administered through the nasal route. It is useful in all the diseases manifesting above the neck line (*ūrdhvajatrugata*) because it eliminates toxins through the nostril. On the basis of its therapeutic action and the way of administration it is classified into many types like *virecana nasya* (cleansing), *bṛmhāna nasya* (nutritive) *śamana nasya* (pacifying), *nāvana nasya* (decoction *nasya*) *marṣa nasya* (ghee or oil *nasya*) and *pratimarṣa* (daily usable *nasya*) etc.
- v. **Raktamokṣana:** *Raktamoksana* or bloodletting is one of the *pañcakarma* developed by Suśruta as a specialized technique. Here the prescribed amount of venous blood is extracted by using either sharp instrument or specialized equipment or leech. It is helpful in relieving diseases of *pitta* origin and chronic skin diseases.

### 5.1.3 Paścāt Karma

In order to bring back the *agni* and stamina to normal state after undergoing rigorous procedures, some specific diet patterns and lifestyle known as *samsarjana karma* are adopted. In this process, initially easily digestible liquid dominant diet is given with gradual introduction of routine diet.

### 5.1.4 Some Allied *Pañcakarma* procedures

Apart from the main *pañcakarma* therapy certain procedures especially of *snehana* and *svedana* have been devised in the later period by different regions of the country with slight modifications to classical *pañcakarma* described in ancient texts. Some of these procedures are described below:

- i. ***Abhyanga***: *Abhyanga* is the procedure of application of oil over the body with mild pressure. *Abhyanga* is invariably followed by *svedana*.
- ii. ***Sarvāṅga Dhārā* or *Pizhichil***: Developed as a specialty of Kerala, *Pizhichil* is a *snigdhasveda* (combination of *snehana* and *svedana*) in which the warmed medicated oil is poured and massaged all over the body or specific part for a stipulated period, in a specific manner. It has the advantage of producing *snehana* and *svedana* simultaneously.
- iii. ***Śirodhāra***: In this process medicated oil/liquid is continuously poured over the forehead and then allowed to flow over the scalp from a specific height for a certain period of time. It is widely used all over the world for stress adaptation and to get good sleep.
- iv. ***Nādi Sveda*** - In this technique fomentation is done to body parts with the vapors generated out of medicated decoction through a tube in conditions like osteoarthritis, sprain or to relieve pain. Proper oleation of the affected part is done prior to *nādi sveda*.
- v. ***Patrapinda Sveda*** - Bolus prepared from medicinal plants along with oil etc. is tied in cotton cloth for application over the affected part.



**Fig. 10- *Patrapinda Sveda***

- vi. ***Sastikāśāli Pinda sveda*** - It is a procedure in which the whole body or any specific part is made to perspire by the application of warm medicated rice puddings externally in the form of boluses tied up in a cotton cloth.

- vii. ***Udavartana*** - It is a procedure in which herbal powders are used for massage mainly for weight reduction or to resolve skin diseases.
- viii. ***Kati Basti*** - It is a procedure in which comfortably warm medicated oil is kept over the lumbosacral area or any adjacent part for a certain period of time with the help of a boundary made from dough of black gram. Depending upon the area of use it is called as *grīvā basti* (cervical), *jānu basti* (knee), *śiro basti* (head) etc.
- ix. ***Uttara Basti*** - The enema which is administered through urethra or vagina is termed as *uttara basti*.
- x. ***Tarpana*** - This treatment aims to provide optimum rejuvenation to eyes. Thick paste of black gram is put around the eye ball. Then medicated oil or ghee is put in this groove to lubricate eye and surrounding areas.
- xi. ***Upanāha*** - In *upanāha* the medicinal paste with or without heating is applied over a specific area. It has to be covered with some leaves and tied with thick cloth. If *upanāha* is done during day, it is removed at night and if done during night, it is removed in the morning.
- xii. ***Pādabhyāṅga*** - It is a specialized feet massage which is very good for the eyes, alleviates tiredness and stress, and induces deep sleep.
- xiii. ***Kriyākalpa*** - *Kriyākalpa* are the specialized treatment procedures meant for the treatment of diseases of eyes. The treatment procedures can be used as preventive measures to maintain the functional integrity of sense organ and also to overcome age related problems.

### **5.1.5 Safety of *Pañcakarma***

When employed skillfully and appropriately, *pañcakarma* procedures are safe and effective for the prevention and management of a number of health problems. The scientific evidence on clinical safety and efficacy of *pañcakarma* was re-validated through a number of clinical studies by adopting the classical Ayurvedic notations and contemporary clinical, bio-chemical and pathological parameters. These parameters have shown substantial evidences towards regression of many chronic disease. The assessment of parameters including hepatic, renal function and lipid profiles have also established clinical safety. In the current scenario, the *pañcakarma* regimen, a unique contribution of Ayurveda may be adopted in the management of chronic and refractory illnesses.

## 5.2 *Kṣārasūtra*

*Kṣārasūtra*, a specially processed medicated thread is applied for ano rectal disorders. This is a minimal invasive para-surgical procedure is widely cited in ancient medical literatures for its safety and efficacy. It is being successfully practiced as promising therapy mainly for ano-rectal disorders since ancient time by Indian surgeons. This technique was first practiced by Suśruta, the renowned ancient Indian surgeon. This technique of treatment was re-established in the Department of *Śalya tantra* at Banaras Hindu University, Central Council for Research in Ayurvedic Sciences and Indian Council of Medical Research. The therapy is very effective even in the management of complex and post-surgical recurrent fistula-in-ano.

Duration of treatment depends upon the condition of disease and status of patient. Usually in simple cases of fistula-in-ano, *kṣārasūtra* can cut and heal 1 cm of tract per week. Duration of treatment may increases in following conditions:

- Fistula which has been operated earlier
- Fistula with many branches
- Fistula with curved tract
- Fistula extended to deeper structures
- Fistula in patients with diabetes mellitus, malnutrition, tuberculosis, anemia and those who are obese.

**5.2.1 Advantages of *kṣārasūtra* therapy-** Merit of this therapy is based on the data of more than 30,000 patients who have been treated successfully by this method of treatment

- 100% cure can be obtained in simple low anal fistulae whereas 93 to 97% cure rate can be achieved in difficult, complex and recurrent fistulae.
- It is an ambulatory form of treatment where hospital stay is minimal.
- Patient can continue routine activity during the course of treatment.
- Damage of tissue is minimal therefore chances of incontinence and strictures are practically nil.
- Cost of treatment is much less, compared to other modalities of treatment.
- Recurrence rate is fairly less in comparison to conventional surgery.

### **5.3 Rasāyana**

*Rasāyana* is therapeutic procedure used to replenish and rejuvenate structural entities of the body. Literally, *rasāyana* means the augmentation of the quality of *rasa*, the vital fluid produced at the end of digestion of food. The aim of *rasāyana* is not only to improve the quality of *rasa*; but to provide the optimum quantity to all the body tissues. It is the *rasa* flowing in the body which sustains life. *Rasāyana* is a specialized branch of clinical medicine meant for preventing the effect of ageing and to improve memory, intelligence, complexion, sensory and motor functions. Numerous *rasāyana* medicines are reported for possessing diversified actions like immuno-modulation, free radical scavenging, adaptogenic or antistress and nutritive effect. From the therapeutic point of view *rasāyana* may be of two types: *kāmya rasāyana* and *naimittika rasāyana*. *kāmya rasāyana* has been advocated for healthy individuals desirous to improve their health and vitality. Depending upon the mode of administration the *rasāyana* therapy is broadly classified in to *vātātapika* and *kutīprāveśika*. In *vātātapika rasāyana*, individual is allowed to attend to his routine work and also undergo the *rasāyana* treatment. In contrary to this, in *kutīprāveśika rasāyana* the individual has to be confined to indoor and not allowed to move in open air and sunlight and also to undergo *rasāyana* therapy. The *ācāra rasāyana* is a type of non-drug management in which by practicing specified code of conduct one can get the desired effects of *rasāyana*.

**Note to the readers:** Ayurveda adopts diversified therapeutic approaches. Some of them are originally prescribed in Ayurvedic classics and some are modified approaches developed later by the traditional practitioners. These therapies again have regional diversifications in the country. Some of the most commonly used therapies are mentioned in this chapter and other varieties and details like their indications, procedures, complications etc. are available in books like:

1. Anonymus. The Guidelines on Basic Training & Safety in Panchakarma. New Delhi, India: Central Council for Research in Ayurveda & Siddha , Department of AYUSH, Ministry of Health and Family Welfare , Government of India; 2008.
2. Acharya G Srinivasa. Pancakama Illustrated. New Delhi, India: Chaukhamba Sanskrit Pratishtan; 2006.
3. Singh RH. Panchakarma Therapy (Ancient classical concepts, traditional practices, recent advances & guidelines of standard Practice). Varanasi, India: Chaukhamba Sanskrit series office; 2002.

## Chapter 6

### RESEARCH AND DEVELOPMENT

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Like other systems of ancient Indian learning, Ayurveda is discovered through suitable sources of acquiring knowledge and producing evidence (*pramāṇa*) viz. (1) *pratyakṣa* (direct perception), (2) *anumāna* (inference), (3) *āptopadeśa* (authoritative and documentary testimony), (4) *yukti* (reasoning) etc.

Presently the research in Ayurveda is conducted through multi-disciplinary approach. The drug development phase includes selection of research area on the basis of national priority and literature, growing and collection of authentic raw materials by using good practices, standardization, safety/ toxicity studies, targeted biological activities, phased clinical trials. The research proposal has to be approved by ethics committee and undergoes a scrutiny of scientific and monitoring committees, which includes experts from Ayurveda, Allopathy, Biostatistics, Pharmacology etc. Besides the infrastructure under the Department of AYUSH and Central Council for Research in Ayurvedic Sciences, the research in this sector is being undertaken by Indian Council of Medical Research (ICMR), Council of Scientific and Industrial Research (CSIR), Department of Science and Technology, Department of Biotechnology, various Universities, Medical Colleges, AYUSH Colleges, Non Government Organisations (NGOs), Hospitals, Pharmaceutical Industry etc. mainly on following areas.

- ◎ **Fundamental or Basic Research-** interpretation and revalidation of Ayurvedic basic principles
- ◎ **Literary Research-** revival, preservation, translation, critical analysis, systematization and publication, digitalization of texts and manuscripts
- ◎ **Drug Research-** drug development including standardization & quality assurance; preclinical safety and biology activity studies; medico-etho botanical survey and cultivation of medicinal plants
- ◎ **Clinical Research-** validation of Ayurvedic drugs and therapies through observational studies and phased clinical trials

## **6.1 Central Council for Research in Ayurvedic Sciences**

The Central Council for Research in Ayurvedic Sciences (CCRAS) is the apex body set up by the Government of India for formulation, coordination, development and promotion of research in Ayurveda on scientific lines. Its activities on literary research, drug research, clinical research and other related activities are carried out through its 30 peripheral institutes and also in collaboration with premier institutions. All the research activities are carried out in compliance with appropriate guidelines. These activities will be reviewed to ensure that Council undertakes meaningful research under fixed parameters within specified period and disseminate research findings for the benefit of educationists, researchers, physicians, manufacturers and common man. So far the CCRAS has obtained patents for 17 different inventions and 12 products have been commercialized. The important ones are AYUSH-64 an anti-malarial preparation, 777 Oil for psoriasis, Bal Rasayan for general immunity of children, AYUSH-56 an anti-epileptic preparation, *kṣārasūtra* for ano-rectal diseases and 8 formulations related to reproductive and child health.



**Fig. 11- Central Council for Research in Ayurvedic Sciences, New Delhi**

Research conducted over the last thirty years by CCRAS has shown specific areas of strength where traditional medicine is particularly useful. Some of the major outcomes of the research include:

- ◎ **Guggulu and its extracts** for hyperlipidaemia and atherosclerosis (Clinical and Experimental trial of Guggulu, Central Council for Research in Ayurveda & Siddha. Janakpuri. New Delhi. 1989).

- ◎ **Puśkara Guggulu** for coronary insufficiency for stable angina (Singh, Ramji et. al. Puskara-Guggulu an anti-anginal and hypolipidemic agent in coronary heart diseases (CHD), Journal of Research in Ayurveda and Siddha, Vol. XII. 1991).
- ◎ **Varuna** for UTI, urolithiasis and benign prostate hypertrophy (Effects of Varuna (*Crataeva nurvala*) in enlarged prostate and associated urinary disorders, Central Council for Research in Ayurveda & Siddha. Janakpuri. New Delhi. 1987).
- ◎ **Brāhma** and **Māndūkaparnī** to promote mental health (Clinical and Experimental studies on Rasāyana drugs and Pañcakarma therapy, Central Council for Research in Ayurveda & Siddha. Janakpuri. New Delhi. 1993; Kuppurajan K. et. al. Anti-anxiety effect of an Ayurvedic compound drug-A crossover trial, Journal of Research in Ayurveda & Siddha. Vol XIII. 1992).
- ◎ **Aśvagandhā** as rejuvenator (Kuppurajan et al., Effect of Ashwagandha (*Withania somnifera*) on the process of ageing in human volunteers. Journal of Research in Ayurveda and Siddha. 1980; Volume: 1/ issue: 2. Pp: 247- 258).
- ◎ **Pañcakarma** therapies for paralytic disorders (Management of *Khanja* and *Pangu*. Central Council for Research in Ayurveda & Siddha. Janakpuri. New Delhi. 1999).
- ◎ **Kṣārasūtra** ligation for anal fistula and haemorrhoids (Management of Bhagandara (fistula in-ano) with ksharasootra. Central Council for Research in Ayurveda & Siddha. Janakpuri. New Delhi. 1989; Shukla N.K., Narang R., Bair K., Radhakrishna S. and Satyavati G.V. Multicentric randomized controlled clinical trials of Ksharasootra (Ayurvedic medicated thread) in the management of fistula in ano. Ind. Jour. Med. Res. (B) 94 June, 1991, p. 177-185).
- ◎ **Ayush-64** Anti-malarial for P-vivax (Ayush-64 a new anti-malarial herbal compound. Central Council for Research in Ayurveda & Siddha. Janakpuri. New Delhi. 1987; Acharya M.V. et al. Double-blind Clinical trial with Ayush-64 an Ayurvedic drug in P.Vivax Malaria, Jour. Res. Ay. Sid. Vol. VI. 1985).

### **6.1.1 Priority Areas for Research**

The department of AYUSH has identified following areas for research on the basis of national priority and by considering the strength of Ayurveda. The department also directly supports research projects under 'Extra Mural Research Scheme' on these areas:

- Reproductive Child Health (RCH)
- Preventive cardiology-
  - Hypertension
  - Atherosclerosis
  - Dyslipidemia
- Liver Disorders (Hepatitis B)
- Rheumatoid arthritis
- Gastrointestinal disorders
  - Hepatic disorders
  - Diarrhoea
- GI tract disorders — Gastritis, Peptic Ulcer, Non Ulcer Dyspepsia,
  - Ulcerative Colitis, Sprue Syndrome
- Musculoskeletal disorders
  - Osteoporosis
  - Osteoarthritis
  - Rheumatoid arthritis
  - Fibromyalgia
- Eye diseases
  - Diabetic retinopathy
  - Computer vision syndrome
- Metabolic syndrome
- Male infertility — oligospermia
- Dyslipidaemia
- Diabetes mellitus and its complications
- Early Stages of Nephritis
- Erectile disorder
- Skin diseases, Urticaria
- Respiratory diseases
- Generalized anxiety disorder
  - Depression
  - Insomnia
- Anaemia
- Malaria
- Urolithiasis
- Ano-rectal conditions — Piles, Fistula-in-ano and Fissure, para-surgical procedures
- Benign Prostatic Hypertrophy
- Wound healing
- Neurodegenerative conditions — Parkinsonism, Senile Dementia,
- Neurological disorders
- Migraine
- Rasāyana therapy and geriatrics
- Quality of life (QOL) in cancer patients.

### 6.1.2 Policy support for Research

To strengthen the R&D in this sector at policy level, the government of India has taken initiatives to address the basic pre requisites of quality, safety and efficacy of medicines and procedures which are summarized below:

Sl. No.	Issue	Initiative
1	<b>Cultivation of medicinal plants and manufacture</b>	For good cultivation practices and good manufacturing practices laid down in Drugs and Cosmetics Act 1940
2	<b>Quality assurance</b>	PCIM /Pharmacopeia committees / drug controlling authorities
3	<b>Safety and efficacy</b>	Experimental and clinical trials, feasibility operational studies promoting evidence based practices, pharmacovigilance
4	<b>Mainstreaming and accessibility</b>	National Health Policies 1983, 2002, The National Population Policy-2000, National Commission on Macro-economics Health-2005 etc.

The Central Council for Research in Ayurvedic Sciences has well developed Research Policy document to carry out research in the field of Ayurveda.

### 6.1.3 Drug development process

The clinical trials in Ayurveda involve following steps

- ◎ Identification of priority area on the basis of national priority and strength of Ayurveda
- ◎ Literature Survey to form hypothetical basis for interventions
- ◎ Standardization of medicines and procedures
- ◎ Pre-clinical safety (as applicable)
- ◎ Biological activity studies (as applicable)
- ◎ Designing of protocols and case record forms with multidisciplinary consultation by incorporating both Ayurvedic and modern standard parameters.
- ◎ Regulatory requirements like ethics committee approval, registration in clinical trial registry and approval of drug controller when applicable

- ◎ Conducting clinical trial
- ◎ Patent (as applicable ) and commercialization

#### **6.1.4 AYUSH Research Portal**

In order to make research findings in AYUSH systems and allied faculties accessible through web, the Department of AYUSH has initiated AYUSH Research Portal. The Central Council for Research in Ayurvedic Sciences (CCRAS) and the National Institute of Indian Medical Heritage (NIIMH), Hyderabad are coordinating and maintaining this freely accessible web portal in collaboration with National Informatics Centre, Hyderabad. The portal is accessible through website [www.ayushportal.ap.nic.in](http://www.ayushportal.ap.nic.in).

#### **6.1.5 Standardization and Quality Control of Medicines**



**Fig. 12- View of Standardization and Quality Control Laboratory of ASU drugs**

Objectives of standardization and quality control of Ayurvedic medicines are to ensure identity, quality and purity and detection of adulterations. These are important determinants of safety and efficacy of the products.

This activity is carried out through several drug standardization units, research centres, drug testing laboratories at national and regional level, both in public and private sector. These laboratories

use internationally accepted parameters for standardization and quality control. The Government of India has set up the Ayurvedic Pharmacopoeial Committee (APC) in 1962 to prescribe standards of single drugs and compound formulations mentioned in Ayurveda for the use of manufacturers. An independent Pharmacopoeia Commission for Indian Medicine has been set up which would work on the lines of other Pharmacopoeia Commissions of the world like the US Pharmacopoeia Commission and the British Pharmacopoeia Commission.



**Fig. 13- Parameters for Standardization of Ayurvedic drugs**

accreditation of laboratories (NABL) and hospitals (NABH) to provide quality assurance as well as quality services to the people QCI has been engaged for third party accreditation.

### 6.1.6 Safety aspect of Ayurvedic medicines

Ayurveda gives utmost importance to patient's safety during treatment through rational use of medications. These are recurrent themes of Ayurvedic pharmacology, pharmaceutics, and therapeutics. The Ayurvedic literature gives details of drug-drug and drug-diet incompatibilities based on elaborately described qualitative differences in ingredients or quantitative proportions. The pharmaceutical procedures starting

from the collection of ingredients (like place, season and time of collection of plant materials, the hygienic considerations, contamination), cleaning, processing, packing and storage, dose of the medicine, *anupāna*, diet, exact indication of treatment with respect to condition of the patient and stage of the disease etc. are recommended in details in Ayurvedic texts. When

In order to ensure quality of drugs prepared as per pharmacopoeial standards, the Department of AYUSH in collaboration with the Quality Council of India (QCI) has developed a scheme for voluntary certification for quality assurance in AYUSH products. Under the scheme AYUSH Standard and AYUSH Premium marks are provided on the product packs. Similarly, for



**Fig. 14- View of instrumentation laboratory for quality control of Ayurvedic Drugs**

therapies are used incorrectly it may produce undesired effect. A special focus is given to purification and other processing of potentially toxic plants and metalo-mineral materials.

In ancient times, the Ayurvedic physicians prepared medicines for their patients by following in-house standards. Today, the production and sale of Ayurvedic drugs has become formalized into a thriving industry. With increased use of drugs of these systems and commercialization has brought with it many challenges about safe use of Ayurvedic medicines. The scope for adulteration, preparation of counterfeit drugs and development of formulations which do not have conceptual basis in these systems has increased. Further, the cultivation of medicinal plants with laboratory generated species is being attempted on the basis of chemical composition and is likely to be used in increased manner for commercial purpose. These changes may have profound impact on the safety and efficacy of the ASU drugs in the market. Hence a mechanism is required to put in place to address them. According to the amendments to Rule 170 of Drugs & Cosmetics Rule 1945, the safety and toxicity studies have become the part of drug development process as and when prescribed. There are national guidelines available on *in-vitro*, *in-vivo* and clinical testing of safety and toxicity, which are framed on the basis of global requirement.



Fig. 15 -Pre-clinical safety studies of Ayurvedic drugs

During recent past, certain Ayurvedic formulations were questioned for containing heavy metals and studies conducted by CCRAS on the formulations *viz.* of *Svarna Mahā Yogarāja Guggulu*, *Navaratna Rasa*, *Mahā Lakṣmīvilāsa Rasa*, *Mahāsudarśana Ghana Vati* have been found to be safe. Some commonly prescribed metal based drugs *viz.* *Kajjalī*, *Rasa Sindūra*, *Vasanta Kusumākara Rasa*, *Ārogyavardhani Vati*, *Mahāyogarāja Guggulu*, *Mahā Lakṣmīvilāsa Rasa*, *Makaradvaja* and *Rasa Māṇikya* were taken up for chemical characterization, physico- chemical analysis, sub chronic toxicity studies, which yielded supportive results.

### 6.1.7 Pharmaco-vigilance program for ASU drugs

Taking the WHO guidelines for the safety issues of herbal medicines into consideration and to put pharmaco-vigilance system for ASU drugs in proper place, the Department of AYUSH, India had launched Pharmaco-vigilance Programme for ASU Drugs. A National Pharmaco-vigilance Resource Centre at Institute for Post Graduate Teaching and Research in Ayurveda, Jamnagar, as National Pharmaco-vigilance Resource Centre for Ayurveda, Siddha and Unani Drugs (NPRC-ASU) in India was established for coordinating National Pharmacovigilance Program. Further this program was also guided by National Pharmaco-vigilance Technical Advisory Committee (NPTAC-ASU), a technical committee mainly concerned with reviewing and analyzing the ADRs reported at different levels and to suggest proper remedial measures.

To develop the culture of notification and to involve healthcare professionals and professional associations in the drug monitoring and information dissemination processes, teachers, physicians and pharmacists of ASU systems, were sensitized on the concept of pharmaco-vigilance and how to report ADR through training programs, across the country.

### 6.2 Important Research Outcomes

During the past decades, several Ayurvedic medicines have been investigated with respect to physico-chemical standardization, pharmacological effects, safety and efficacy, product development, cultivation of medicinal plants and manufacturing practices. Similar to conventional medicine, Ayurvedic medicine sector has also been bonneted from advances in science and technology. These advances facilitated the understanding of diseases, development of better pharmaceutical products and the implementation of diagnostic techniques. In vitro and in vivo studies also have now confirmed the pharmacological properties of many Ayurvedic medicines.

For example, *Śatāvari* (*Asparagus racemosus*) root used in Ayurveda as a galactogogue was studied in experimental animals and reported to contain *Shatavarin* having a specific pharmacological action. *Picrorrhiza kurroa* has been reported to possess *Picrocytes* as active principles. *Butea frondosa*, which is used in Ayurvedic preparations as an anthelmintic, has yielded an active principle called *palaconin*. Guggulosterone from *Guggulu* resin has been isolated. The resin is used extensively in Ayurveda for the treatment of inflammation of joints, obesity, lipid disorders, etc., on the basis of the description of *Medoroga* (lipid disorder). The researchers conducted at ICMR, CSIR provided significant leads on efficacy of AYUSH

## Chapter 6: Research and Development

drugs/therapies viz. *Pippali* as Bioavailability- enhancer, *Vijayasāra* for diabetes, *Kṣārasūtra* for ano-rectal disorders. Below mentioned are some select research publications which form evidence for certain Ayurvedic medicines and therapies:

### A. Metabolic Disorders

- ◎ **Terminalia chebula in diabetes mellitus** - Gandhipuram Periasamy Senthilkumar, Sorimuthu Pillai Subramanian. Biochemical studies on the effect of Terminalia chebula on the levels of glycoproteins in streptozotocin-induced experimental diabetes in rats. J. Appl. Biomed.2008; 6: 105–115.
- ◎ **Anti-hyperglycemic and Anti-dyslipidemic activity of *Dioscorea bulbifera*** - Ahmad Z et. al .Anti-hyperglycemic and Anti-dyslipidemic activity of aqueous extract of *Dioscorea bulbifera* (Tubers). Diabetologia croatica. 2009; 38-3.
- ◎ **Anti-hyperglycemic and anti-oxidant effect of *Berberis aristata*** - Kakkar PJ. Ethenopharmacol Anti-hyperglycemic and anti-oxidant effect of *Berberis aristata* root extract and its role in regulating carbohydrate metabolism in diabetic rats, Singh. J. Vol. 123 (1):22-26, 2009.
- ◎ ***Cuminum cyminum* in diabetes** - Dhandapani S, Subramanian VR, Rajagopal S, Namasivayam N. Pharmacol Res Hypolipidemic effect of *Cuminum cyminum* L. on alloxan-induced diabetic rats. 2002 Sep; 46(3):251.
- ◎ ***Curcuma longa* in diabetes** - *Curcuma longa* (turmeric), Monograph, Altern Med Rev. 2001 Sep;6 Suppl:S62-6.PMID:11591174.
- ◎ **Antidiabetic** Akhtar MS, Qureshi AQ, & Iqbal J. evaluation of *Mucuna pruriens* Linn. seeds, The Journal of the Pakistan Medical Association.1990; 40(7):147-50.
- ◎ **Anti-hyperlipidemic activity of *Terminalia chebula* & cow's urine-** Dipa A. Israni1, Kirti V. Patel, Tejal R. Gandhi.Anti-hyperlipidemic activity of aqueous extract of *Terminalia chebula* & gaumutra in high cholesterol diet fed rats,.pharma science monitor an international journal of pharmaceutical sciences. 2010;Vol-1: Issue-1.
- ◎ ***Commiphora wightii* in lipid disorders** - Clinical and Experimental Trial of Guggulu. Central Council for Research in Ayurveda and Siddha. Janakpuri, New Delhi. 1989.

## B. Neurological Disorders

- ◎ *Brāhmaī ghṛta* as medhya (brain tonic and anticonvulsant) - Achliya GS, Wadodkar SG, Dorl AK. Evaluation of CNS activity of Bramhi Ghrita. Indian J. Pharmacol. 1 | 2005 February; Vol 37 Issue 1: 33-36.
- ◎ Anti-convulsant activity of *Pañcagavya Ghṛta* - Koneru Anupama. Anticonvulsant activity of Panchagavya Ghrutham- A polyherbal Ayurvedic formulation. Journal of Pharmacy Research. 2009; Vol 2: No 5.
- ◎ *Bacopa monnieri* in memory impairment - Hota SK, Barhwal K, Baitharu I, Prasad D, Singh SB, Ilavazhagan G. *Bacopa monnieri* -leaf extract ameliorates hypobaric hypoxia induced spatial memory impairment. Neurobiology of Disease. 2009.
- ◎ Role of the Ayurvedic Drug Brahmi (*Bacopa monnieri*) in the management of Senile Dementia. *Pharmacopsychiatry* (1990), 3, 47-52.
- ◎ *Bacopa monnieri* in epilepsy – Khan R, KrishnakumarA. Paulose CS. Decreased glutamate receptor binding and NMDA R1 gene expression in hippocampus of pilocarpine-induced epileptic rats. Neuroprotective role of *Bacopa monnieri* extract. Epilepsy & Behavior 2008;12:54-60.
- ◎ Pañcakarma (nasya) in migraine- Srikanth N. Aryavaidyan. A clinical study on the role of nasya karma and ghrita pana in the management of ardhavabhedaka vis-a-vis migrainous headache. 2001 April; Vol XIV: pp 166-171.
- ◎ Pañcakarma for Hemiplegia - Management of Hemiplegia by Pañcakarma therapy, Central Council for Research in Ayurveda and Siddha. Janakpuri, New Delhi-1990

## C. Joint Disorders

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**Fig. 16- Marica (*Piper nigrum*)**

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**Fig. 17- Citraka (*Plumbago zelanica*)**

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### **6.3 Commonly used Medicinal Plants**

A number of medicinal plants used in Ayurveda have been studied and these evidences have corroborated the therapeutic indications described in Ayurveda.



**Fig. 18- *Arjuna***  
**(*Terminalia arjuna* W&A.)**

**Uses -** Hypertension, ischaemic heart disease



**Fig. 19- *Aśvagandhā***  
**(*Withania somnifera* Dunal)**

**Uses-** Neurasthenia, as aphrodisiac, antistress, rejuvenator



**Fig. 20- *Harītakī***  
**(*Terminalia chebula* Retz.)**

**Uses-** Constipation, oedema, obesity



**Fig. 21- *Āmalakī***  
**(*Emblica officinalis* Gaertn.)**

**Uses -** Anaemia, hepatitis, haemorrhagic disorders, acid peptic diseases, as immuno modulator



**Fig. 22- *Ārdraka***  
**(*Zingiber officinale* Roxb.)**

**Uses -** Gastro-intestinal disorders, bronchial asthma



**Fig. 23- *Gudūci***  
**(*Tinospora cordifolia* Willd. Miers.)**

**Uses -** Fever, hepatitis, gout, as immuno modulator



**Fig. 24- *Satāvari***  
**(*Asparagus racemosus* Willd.)**



**Fig. 25- *Nimba***  
**(*Azadirachta indica* A.Juss)**

**Uses** - Insufficient lactation, leucorrhoea, peptic ulcer

**Uses** - Urticaria, skin diseases, gastritis, hemorrhoids, as antiseptic and anti viral



**Fig. 26- *Hingu***  
**(*Ferula foetida* Regel.)**



**Fig. 27- *Saptacakra***  
**(*Salacia oblonga* Wall.)**

**Uses** - Dyspepsia, abdominal colic, toothache

**Uses** - Diabetes mellitus, dyslipidaemia, obesity



Fig. 28- *Sallaki*  
(*Boswellia serrata* Roxb.ex Coleb.)



Fig. 29- *Siriṣa*  
(*Albizia lebbeck* Bent)

**Uses** - Arthritis, inflammatory conditions, colitis

**Uses** - Anti-allergic, antidote for various poisoing, useful in bronchial asthma, bronchitis and skin disorders



Fig. 30- *Katuki*  
(*Picrorhiza kurroa* Royle ex Benth.)

**Uses** - Liver disorders, dyslipidaemia, diabetes mellitus



Fig. 31- *Tagara*  
(*Valeriana wallichii* DC)

**Uses** - Hypertension, insomnia, as hypnotic, sedative, nervine tonic etc.



**Fig. 32- *Vārāhīkanda***  
**(*Dioscorea bulbifera* Linn.)**

**Uses** - Debility, emaciation



**Fig. 33- *Śaṅkhapuṣpi***  
**(*Convolvulus pluricaulis* Choisy)**

**Uses** - Memory & sleep disorders, epilepsy



**Fig. 34- *Varuṇa***  
**(*Crataeva nurvula* Buch-Ham.)**

**Uses** - Urinary disorders, prostatic hypertrophy, urolithiasis



**Fig. 35- *Dāruharidrā***  
**(*Berberis aristata* DC)**

**Uses** - Liver disorders, dysentery, diabetes mellitus



**Fig. 36- *Kapikacchu*  
(*Mucuna prurita* Hook.)**



**Fig. 37- *Bākuci*  
(*Psoralea corylifolia* Linn.)**

**Uses -** Neurasthenia, Parkinsonism, as aphrodisiac, antistress and rejuvenator

**Uses -** Skin disorders, leucoderma



**Fig. 38 *Kālamegha* (*Andrographis paniculata* (Burm. f.) Wall. ex Nees)**

**Uses -** Fever , liver disorders,



**Fig. 39- *Bhūmyāmalaki* (*Phyllanthus amarus* Schum & Thonn.)**

**Uses -** Liver disorders, hepatitis-B



Fig. 40- *Brāhma*

(*Bacopa monnieri* (Linn.) Wettst.)

**Uses** - Memory & sleep disorders, epilepsy



Fig. 41- *Haridrā*

(*Curcuma longa* Linn.)

**Uses** - Bronchial asthma, diabetes mellitus, allergic conditions, skin diseases, as wound healing



Fig. 42- *Sigru*

(*Moringa oleifera* Lam.)

**Uses** - Abscess, septic conditions, wound, piles, inflammation, neuritis, joint diseases



Fig. 43- *Yastimadhu*

(*Glycyrrhiza glabra* Linn.)

**Uses** - Cough, hyperacidity, haemorrhage, wound, peptic-ulcer, debility



**Fig. 44- *Bilva***  
**(*Aegle marmelos* Corr.)**

**Uses** - Dysentry, diarrhea, diabetes mellitus



**Fig. 45- *Mandukaparni***  
**(*Centella asiatica* (Linn) Urban.)**

**Uses** - Memory & sleep disorders, epilepsy



**Fig. 46- *Mesaśringī***  
**(*Gymnema sylvestre* R.Br.)**

**Uses** - Diabetes mellitus



**Fig. 47- *Amlavetasa***  
**(*Hippophae rhamnoides* L.)**

**Uses** - Diabetes mellitus, metabolic syndrome, obesity



**Fig. 48- Aśoka**  
**(*Saraca asoca* (Rosc)DC Willd)**

**Uses** - Menstrual disorders, haemorrhagic disorder



**Fig. 49- Kumāri**  
**(*Aloe barbadensis* Mill.)**

**Uses** - Liver and skin disorders, Menstrual disorders



**Fig. 50- Nirgundi**  
**(*Vitex negundo* Linn.)**

**Uses** - Arthritis, neurological diseases



**Fig. 51- Pārijāta**  
**(*Nyctanthes arbor-tristis* Linn.)**

**Uses** - Fever, sciatica



**Fig. 52- *Eranda***  
**(*Ricinus communis* Linn.)**

**Uses** - Arthritis, neurological diseases, constipation



**Fig. 53- *Methikā***  
**(*Trigonella foenum - graecum* Linn.)**

**Uses** - Dyslipidaemia, obesity, diabetes mellitus



**Fig. 54- *Rasona***  
**(*Allium sativum* Linn.)**

**Uses** - Dyslipidaemia, obesity, inflammation



**Fig. 55- *Kuṭaja***  
**(*Holarrhena antidysenterica* (Roth) A.DC)**

**Uses** - Diarrhoea, dysentery, colitis



**Fig. 56- *Pippali***  
**(*Piper longum* Linn.)**

**Uses -** Cough, allergy, indigestion, bronchial asthma, bronchitis



**Fig. 57- *Vasā***  
**(*Adhatoda vasica* Nees)**

**Uses -** Bronchitis, bronchial asthma, epistaxis and hematemesis, dysmenorrhoea



**Fig. 58- *Punarnavā***  
**(*Boerhaavia diffusa* Linn.)**

**Uses -** Urinary disorders like UTI, , dysuria



**Fig. 59- *Tulasi***  
**(*Ocimum sanctum* Linn.)**

**Uses -** Bronchitis, skin diseases, allergy, anemia, fever, liver disorders



**Fig. 60- Dādima**  
**(*Punica granatum* Linn.)**



**Fig. 61- Kāravellaka**  
**(*Momordica charantia* Linn.)**

**Uses** - Diarrhea, dysentery, bleeding disorders

**Uses** - Diabetes mellitus, skin disease, worm infestation



**Fig. 62- Guggulu (*Commiphora wightii* (Arn.) Bhand.)**

**Uses** - Dyslipidaemia, obesity, arthritis

## **Chapter 6: Research and Development**

**Note to the readers:** The research has been carried out on various facets of basic principles, treatment of diseases and different aspects of health and diseases. The readers may take note that other important research and publications on Ayurveda exist. However, it was not possible to accommodate all of them in this abridged version and only some representative research works have been mentioned. Nevertheless material on these important issues can be found in books, journals, websites mentioned in concerned section of this document.

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## Chapter 7

### EDUCATION AND PRACTICE

#### 7.1 Education

India has a rich tradition of learning and teaching right from the antiquity and was the knowledge transferred orally from generation to generation. Ayurveda was also taught in *Gurukula* system. *Gurukula* system is an ancient Indian concept of education, wherein the participants got knowledge by residing with his teacher as part of his family and by following self discipline. The student was allowed to start independent practice after obtaining the certification from the *guru*. The *guru* also had to follow the prescribed code of conduct. The process of selecting suitable student by the teacher, and suitable teacher by the student has been described in Ayurvedic classics. The classics also describe ideal methods of learning: self-study, teaching and discussions. The knowledge at that time was also exchanged through professional gatherings, seminars and symposia.

The ancient medical education system in India was a wholesome balance between the theory and practice. The practical training had three main objectives:

- Preparation of medicine
- Examination of the patients, diagnosis of the diseases and Practice of medicine
- Practice for surgery , initially on dummies

*Gurukula*, the personalized teacher based Institutions were later developed as full fledged Institutions. Around 3<sup>rd</sup> to 6<sup>th</sup> BC there were big Universities of Indian learning like Takshashila and Nalanda who were imparting education in different streams including Ayurveda. Takshashila was one of the most ancient Universities which attracted students from around the world. It had a management and academic council to take charge of all affairs. Hindu, Jain and Buddhist religions were taught along with mathematics,



Fig. 63- Institute of Medical Sciences, Banaras Hindu University, Varanasi

science, medicine, fine arts and vocational subjects. Education and boarding were free, but the demission process was rather very rigorous and only few were able to pass through the entrance tests. In medieval period the tradition of teacher to student and father to son continued in learning and practice of Ayurveda.

Presently, Ayurvedic education in India is regulated by a statutory professional body, Central Council of Indian Medicine (CCIM) established under the Indian medicine central council act, 1970 of Government of India. The central council frames and implements the curricula and syllabi in Indian systems of medicine *viz.* Ayurveda, Siddha and Unani-Tibb at under-graduate and post-graduate level.

The CCIM with the prior approval of Government of India has prescribed minimum standard requirements (MSR) for Ayurveda colleges. The MSR include norms for infrastructure, teaching & training facilities, student-bed ratio, hospital departments etc. There is another set of regulations prescribed for post graduate education in Ayurveda. PG regulations include norms for teaching facilities, student-teacher ratio and specialties for post graduation.

Presently, the various courses of Ayurveda are being conducted by different colleges under the supervision of Indian universities:

1. Bachelor of Ayurvedic Medicine and Surgery (BAMS), 5 ½ years (including one year supervised clinical training) under graduate (UG) Course- students are eligible for this course after passing intermediate with physics, chemistry and biology. The syllabus covers all aspects of Ayurveda and relevant portions of modern medicine. The students have to undergo training in both Ayurveda and Allopathic hospitals as per the schedule devised in the syllabus. At the end of course, 12 months clinical supervised training in the form of Internship is imparted in hospitals.



**Fig. 64- National Institute of Ayurveda, Jaipur,**

2. Doctor of medicine - MD (Ayurveda), a 3 years' post graduate (PG) course - Person with a graduate degree in Ayurveda recognised by CCIM, is

- eligible for PG course. Presently, the PG course is imparted in 22 specialties of Ayurveda.
- 3. Ph.D. (Ayurveda) - full time doctoral research program of minimum 2 years duration conducted by various Universities is available in India. Minimum qualification for PhD course is Post Graduate degree in Ayurveda recognised by CCIM.
  - 4. PG Diploma courses in Ayurveda – Sixteen PG Diploma courses in Ayurvedic specialties like *pañcakarma*, *ksārasūtra* etc. of two years duration have been devised by CCIM and are being conducted. Minimum qualification for these Diplomas is Graduation degree in Ayurveda recognised by CCIM.
  - 5. Specialized Degrees - Courses in Pharmacy and medicinal plants such as M. Sc. (Med. Plants in Ayurveda), Ph.D. (Med. Plants), D. Pharma (Ayurveda), B. Pharma (Ayurveda) and M. Pharma (Ayurveda) are also imparted by institutions such as Gujarat Ayurved University, Jamnagar, Banaras Hindu University, Varanasi etc.
  - 6. Educational opportunities for International scholars - Government of India granting scholarships for international scholars recommended through Indian Embassies for taking up formal Ayurveda studies in Indian Institutions. Department of AYUSH has reserved



**Fig. 65 Institute of Post Graduate Teaching and Research in Ayurveda, Jamanagar, Gujarat**

some seats in premier institutions for the admission of international scholars. Students have to contact Indian embassies in their countries for obtaining scholarships. NIA, Jaipur, BHU Varanasi and Gujarat Ayurved University, (GAU) Jamnagar are also offering various short term courses for International scholars. Gujarat Ayurved University,

Jamnagar through International Centre for Ayurvedic Studies runs exclusive BAMS course in English medium for foreigners. In addition, following short courses are also devised and

conducted for persons having graduation in Ayurveda /traditional medicines, foreign modern medical degree or qualification in other allied subjects.

Name of the course	Duration
Introductory Course in Ayurveda	3 Months
Certificate course in <i>Pañcakarma</i>	7 months
Certificate course in Dietetics	7 months
Certificate course for <i>Pañcakarma</i> Technician	One year

## 7.2 Ayurvedic Medical Practice

During *Vedic* period, the priests performing religious rites and ceremonies were also practicing the system of health and were called *vaidya*. Such sage-physician-surgeons of the time were deeply devoted holy people and saw health as an integral part of spiritual life. The information about the ancient practitioners of Ayurveda is available mainly through the texts that they have written. Ashwinis were the twin physicians to both humanity and divine personalities who are credited for discovering a popular *rasāyana* called *cayavanaprāśa*. Ātreya, Agniveśa, Caraka were famous physicians. Suśruta, the ancient surgeon has elaborately mentioned management procedures for anal fistula, fractures, obstructed labour, amputation, excision of tumours, repair of hernia, couching of cataract, rhinoplasty, lobuloplasty and skin grafting in his treatise *Suśruta Saṃhitā*. The court physicians (*Rājavaidya*) were responsible for the health of the king and his family. They also ensured the quality of food for the royal family. Jīvaka was a famous physician - surgeon to lord Buddha. The practice of Ayurveda continued at individual and institutional level.

The practice in this system is being regulated through IMCC Act 1970 and the register of trained practitioners is maintained by the Boards duly established. Professionals with medical qualifications granted by Universities, in or outside India which is recognized by CCIM are allowed to register and practice in India. There are three types of Ayurvedic practitioners in India.

- Traditionally trained practitioners under the guidance as apprentices of some experts. They were registered till the new provisions of IMCC Act, 1970 came in to force.
- Institutionally qualified trained practitioners having degrees in Ayurveda.

- Specialists of Ayurveda i.e. post graduate (M.D. Ayurveda) and doctorate (Ph.D.) degree holder.

Two major groups in health care in the country are public health sector and private health sector. The public health sector consists of central government, state government and municipal & local level bodies. Health is a state responsibility, however the central government does contribute in a substantial manner through grants and centrally sponsored health programs/schemes. There are other government ministries and departments of the government such as defense, railways, police, ports and mines who have their own health services institutions for their personnel. The health care in public sector is either free of cost or involves nominal user charges.

The private health sector consists of the 'not-for-profit' and the 'for-profit' health sectors. The not-for-profit health sector includes various health services provided by non government organizations (NGO's), charitable institutions, missions, trusts, etc. Health care in the for-profit health sector consists of various types of practitioners and institutions. The Ayurvedic doctors provide their services through both these public and private health sectors.

As on 2011, the health care services are being extended to the masses through a huge network of 429246 registered Ayurveda practitioners, 2420 Ayurveda hospitals, and 15017 dispensaries. The medicines are dispensed in either dispensary attached to the clinic or the hospital by the outside pharmacies through the prescriptions. Ayurvedic procedures like *pañcakarma* and *kṣarasūtra* are also practiced in the specialty centers established at different levels.

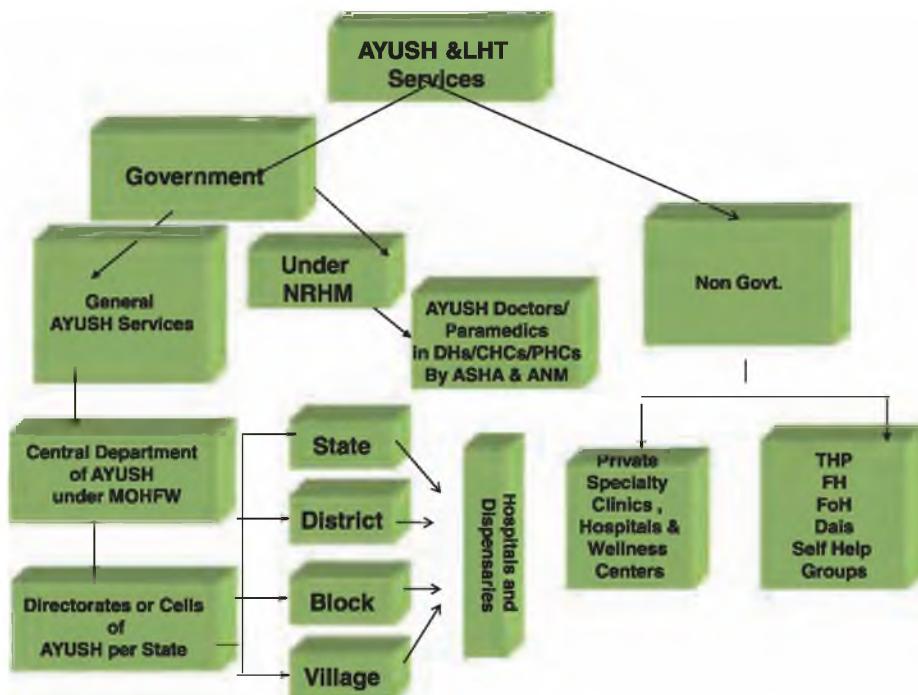
### **7.2.1 Mainstreaming of AYUSH**

The health care system in India is very unique as various indigenous systems are widely accepted and practiced parallel to the mainstream allopathic system of medicine. The AYUSH was formally institutionalized in modern India as far as education and service delivery are concerned. It was further integrated with the government health services at central government health scheme (CGHS), employees' state insurance hospitals, state level dispensaries, and other primary and tertiary setups. Banaras Hindu University, Varanasi is the first institution that conceived the idea of integrating the ancient and modern systems of medicine both at the level of education, research and professional practice. Under NRHM, AYUSH doctors are recruited and co-located at primary health centres (PHC)/ community health centres (CHC)/ district

hospitals (DH) level to provide AYUSH services so as to mainstream AYUSH and make it more accessible to the public. AYUSH doctors and staff are playing supportive or trainer roles in many national programs.

Mainstreaming of AYUSH is a policy commitment of Government of India. Some of the major policy initiatives of Government of India which recommend mainstreaming of traditional systems are:

- National Health Policy 1983
- National Health Policy 2000
- National Population Policy 2000
- National Policy on Indian Systems of Medicine and Homoeopathy (ISM&H) -2002
- National Rural Health Mission (NRHM) 2005 to 2012



**Fig. 66- AYUSH in public health**

## **Chapter 7: Education and Practice**

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**Note to the Readers:** Numerous other books of Ayurveda and related sciences are presently available. Only some of the most commonly referred and reputed publications and journals have been mentioned in this document. The websites of organizations of repute working in the field of Ayurveda also find place in this chapter.

## GLOSSARY

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*Abhyanga* - Oil massage

*Adhāraṇīya Vega* - Non-suppressible natural urges

*Agada Tantra* - Toxicology

*Agni* - Digestive and metabolic factors

*Agni mahābhūta* - Basic thermal element

*Annavaha srotas* - Digestive tract

*Anumāna* - Inference

*Anupāna* - Liquids or solids which is to be taken along with or following main drug

*Anuvāsana basti* - Therapeutic enema with medicated oils

*Arka* - Distillate

*Asātmendriyārtha samyoga* - Erroneous interaction of sensory organs with their objects

*Asātmya* - Non-congenial

*Asthi* - Bone tissue

*Asthivaha srotas* - Channels in which bone tissue is formed and transported

*Aṣṭasthāna parīksā* - Eight fold examination of the patient

*Atīndriya* - Beyond the perception of senses

*Auṣadha* - Medicament / drug

*Ācāra rasāyana* - Rejuvenatory lifestyle

*Āhāra* - Food

*Āhāraśakti* - Ingestive and digestive capacity

*Ākāśa mahābhūta* - Basic ethereal elements

*Ākṛti* - Physical feature

*Āma* - End product of improper digestion and metabolism

*Āptopadeśa* - Authoritative and documentary testimony

*Ārtava* - Menstrual fluid

*Āsava/Ariṣṭa* - Medicated fermented preparations

*Āsthāpana basti* - Therapeutic enema predominantly with medicated decoctions

*Ātmā* - Soul

*Bala* - Physical endurance/ immunity

*Bhaiṣajya Kalpanā* - Ayurvedic pharmaceutics

*Bhasma* - Incinerated / calcined material

*Bhedāvasthā* - Stage of differentiation and complications of disease

*Bhūtavidyā* - Psychiatry

*Bhūtagni* - Metabolic factors located in *pañcamahābhūta*

*Brahmacarya* - Control over materialistic pleasures

*Buddhi* – Intellect

*Cikitsā* - Treatment/ procedure of disease management

*Cūrṇa* - Powder

*Daivavyapāśraya cikitsā* - Spiritual therapy

*Dinacaryā* - Daily regimen

*Dhatvāgni* - Metabolic factors located at *dhātu*

*Dhātu* - Structural entities of the body

*Dosa* - Regulatory and functional entities of the body

*Dravya* - Drug/substance

*Dravya Guna* - Materia medica

*Drīk* - Eye/vision

*Dūṣya* - One which gets vitiated by deranged *dosa*

*Ghrīta* - Ghee/clarified butter

*Guna* - Physical/pharmacological properties/attributes

*Guti* - Pill

*Hima* - Cold infusion

*Indriya* - Sensory and motor organs

*Jala mahābhūta* - Basic aqueous elements

*Jātharāgni* - Digestive factors located in digestive tract

*Jihvā* - Tongue

*Jñānendriya* - Sensory organs or faculties

*Kalka* - Paste

*Kaṇḍarā* - Tendon

*Kapha* - One of the regulatory and functional entities which has cohesive function

*Karma* - Action

*Kaumārabhṛtya* - Paediatrics covering obstetrics and gynaecology

*Kāla* - Time

*Kāmya Rasāyana* - Rejuvenating therapies for specific purpose

*Kāyacikitsā* - Internal medicine

*Kriyākalpa* - Treatment procedures for eye

## Glossary

*Kṣāra* - Acrid substance

*Kṣārasūtra* - Medicated thread applied for ano- rectal disorders

*Kutīprāveśika rasāyana* - Rejuvenating procedure confined to indoor facility

*Kvātha* – Decoction

*Lehya/Leha* – Linctus

*Majjā* - Bone marrow

*Majjāvaha srotas* - Channels in which bone marrow is formed and transported

*Mala* - Excretory entities like urine, faeces, sweat etc.

*Manas* - Mind, psyche

*Mandāgni* - Down regulation of *agni*

*Māmsa* - Muscle tissue

*Māmsavaha srotas* - Channels in which muscle tissue is formed and transported

*Medovaha srotas* - Channels in which adipose tissue is formed and transported

*Mūtra* - Urine

*Mūtravaha srotas* - Channels in which urine is formed and excreted

*Naimittika rasāyana* - Disease specific *rasāyana*

*Nādī* - Pulse

*Nidāna* - Cause of disease/ diagnosis of disease

*Nidāna pañcaka* - Five fold approaches of diagnosis

*Nidāna parivarjana* - Avoidance of causative factors

*Nirāgni sveda* - Induction of sweating without using fire

*Nirūha basti* - See *āsthāpana basti*

*Ojas* - Quintessence of all *dhātu* responsible for composite bio-strength

*Pañcakarma* - Five fold cleansing measures to eliminate morbid *dosa*

*Pañcamahābhūta* - Five basic elements

*Pariṇāma (Kāla pariṇāma)* - Environmental causes of disease

*Parpatī* - Medicinal flakes

*Pathya* - Compatible dietary and behavioral practices

*Pādābhyāṅga* - Foot massage

*Phāṇṭa* - Hot infusion

*Pitta* - One of the regulatory and functional entities which has digestive and metabolic functions

*Prabhāva* - Specific activity of drug

*Prajñāparādha* - Intellectual irreverence

*Prakopāvasthā* - Vitiation of accumulated *dosa*

*Prakṛti* - Psycho-somatic constitution/nature

*Pramāṇa* - 1. Anthropometry/proportionate measurement, 2. Methods of perception

*Prasārāvasthā* - Spread of deranged *dosa*

*Pratyakṣa* - Direct perception

*Prāṇavaha srotas* - Channels of respiration/respiratory system

*Pr̥thvī mahābhūta* - Basic earthy/gross element

*Purīṣavaha srotas* - Channels in which faeces is formed and excreted

*Pūrvarūpa* - Prodromal signs and symptoms

*Rakta* - Blood

*Raktamokṣaṇa* - Bloodletting

*Raktavaha srotas* - Channels through which blood is formed and transported

*Rasa* - 1. Taste, 2. Mercury

*Rasa dhātu* - Nutrient fluids

*Rasaśāstra* - Ayurvedic iatro-chemistry/pharmaceutical science related to metals and minerals

*Rasavaha srotas* - Channels in which nutrient fluid is formed and transported

*Rasāyana* - Therapeutic procedure to replenish and rejuvenate structural entities of the body

*Rājasika/rajas* - Psychological attribute related to passion/desire/attachment

*Roga parīkṣā* - Diagnosis of disease

*Rogī parīkṣā* - Clinical examination

*Rūpa* - Signs and symptoms / Manifestation of disease

*Rtu* - Season

*Rtucaryā* - Seasonal regimen

*Sadavṛtta* - Code of conduct

*Samāgni* - Balanced state of *agni*

*Samprāpti* - Pathogenesis

*Samhanana* - Compactness of the body

*Samhitā* - Compendium

*Samsarjana* - Restorative regimen after *pañcakarma*

*Samśamana* - Palliative therapy

*Samśodhana* - Bio-cleansing therapy

*Sañcaya* - Accumulation of *dosa* in their respective places

## Glossary

*Sattva* - Mental status/mind/psychological attribute related to purity

*Sattvāvajaya cikitsā* - Psycho-behavioral therapy

*Sāgni sveda* - Induction of sweating by using heat generated through fire

*Sāra* - Optimal quality of *dhātu*

*Sātmya* - Compatibility

*Snāyu* - Ligament

*Snehana* - Internal or external administration of oils or fats

*Sparśa* - Touch

*Srotas* - Channels of transportation in the body

*Stanya* - Breast milk

*Sthānasamśraya* - Localization of vitiated *doṣa*

*Svarasa* - Expressed juice

*Svasthavṛtta* - Lifestyle advocacy for maintenance of health

*Svedana* - Induction of sweating

*Svedavaha srotas* - Channels in which sweat is formed and transported

*Śabda* - Voice/sound

*Śalya tantra* - Branch of Ayurveda dealing with surgery

*Śamana* - Palliative treatment

*Śālākya tantra* - Branch of Ayurveda dealing with diseases of eye, ear, nose, throat, mouth and head

*Śirā* - Blood vessels and nerves

*Śirovirecana/Nasya* - Procedure by which drug (oil, liquids, fumes or powders etc.) is administered through the nasal route/ nasal instillations

*Śodhana* - 1. Therapeutic purification of drugs, 2. Bio-cleansing therapy

*Śukra dhātu*- Reproductive elements

*Śukravaha srotas* - Channels in which reproductive tissue is formed and transported

*Śadrasa* - Six tastes

*Śatkriyākāla* - Six stages of pathogenesis

*Taila* - oil

*Tāmasika/tamas* - Psychological attribute related to inertia/ignorance

*Tīkṣṇāgni* - Hyper-activity of *agni*

*Tvak* –Skin

*Udakavaha srotas* - Channels for regulation and transportation of fluids

*Udavartana* - Herbal powder massage

*Upadhātu* - Supportive bye products of *dhātu*

*Upanāha* - Poultice/application of warm medicinal paste over a specific body part

*Upaśaya* - Relieving factors

*Uttara basti* - Drug administration through urethra or vagina

*Vamana* - Therapeutic induction of vomiting/emesis

*Vasā* - Animal fat

*Vati* - Tablet

*Vaya* - Age

*Vājīkarana* - A clinical specialty of Ayurveda dealing with virility and good progeny

*Vāta* - One of the regulatory and functional entities which mainly has neurological functions

*Vātātapika rasāyana* - Rejuvenating procedure at outdoor level

*Vāyu mahābhūta*- Basic gaseous elements

*Vihāra*- Lifestyle

*Vikṛti* - Pathological state/disease

*Vipāka* - Metabolic end product

*Virecana* - Therapeutic induction of purgation

*Viruddhāhāra* - Incompatible food

*Viṣamāgni* - Deranged agni

*Viṣya* - Potency of drug

*Vyādhikṣamatva* - Strength of the body to prevent and resist the genesis and progression of disease

*Vyāyāmaśakti* - Physical strength/endurance

*Yukti* - Reasoning

*Yuktivyapāśraya cikitsā* - Rational treatment





**Department of AYUSH  
Ministry of Health & Family Welfare  
Government of India  
New Delhi  
[www.indianmedicine.nic.in](http://www.indianmedicine.nic.in)**