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Classification of Morbidity (Nosology) - Understanding and interpretations from *Ayurveda* and Biomedicine

Review article

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Abstract

The term Nosology refers to the science of classification of disease. Developments in area represent heterogeneous process spanning across long timelines and geographical areas. *Descriptions of Classification of disease are well documented in Ayurveda* codified texts and presents compact classification methodology from the very division of medical specialties in to 8 types (*Ashtangas*) which include *kayacikitsa* (general medicine), *Shalya* (surgery), *Shalakya* (ear, nose, throat, dental and diseases of head), *Balaroga* (Pediatrics), etc., The same is followed for the categorization of diseases too. Apart from this the basis of understanding diseases is pathophysiological (*dosha-dhatu-mala*) and the analysis is based up on *Triskandha* (three arms) 1. *Hetu* (cause), 2. *Linga* (presentation) and 3. *Aushadha* (suitable regimen). This is a distinct feature which carves out a niche for *Ayurveda* in terms of Nosological advantage. Greeco roman medicine started documenting classification of diseases from 16th century The events showcase a transition from Magical remedies to Biographical approach and finally to the Nosological approach which has finally lead to the development of International classification of Disease (ICD). Currently ICD-9 is is implemented and it is now heading for a major revision with ICD-10. This is going to be Operational from the year 2014 and likely to be followed by another major revision ICD-11 (to include standard terminology of some of the alternative medical systems like Chinese and Korean medicine.). An attempt is made in this article to document the chronicle of developments which has led to current International Classification of Diseases (ICD).

Keywords: Diseases classification, Nosological approach, interpretations of Ayurveda, Biomedicine, ICD-10

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Definition:

The term Nosology refers to the science of description and classification of disease. Disease is an abnormal condition affecting the body of an organism. In humans, "Disease" is often used more broadly to refer to any condition that causes pain, dysfunction, distress, social problems, and/or death to the person afflicted or similar problems for those in contact with the person.(1)

Medical coding can be defined as the process of assigning numeric or a combination of numeric and alpha values to all types of medical services (diagnoses, medical procedures, surgery, drugs and other treatments). (2)

Development of Nosography (preparatory phase of nosology) across various medical disciplines of the world is a very heterogeneous process, and includes remote time lines and diverse geographical areas. For instance we find an independent, nearly evolved nosological arrangement of diseases in *Ayurveda*, with clear distinction between disease based on etiology, involvement of tissues (*Dhatu*), channels (*Srotas*) and the region of the body. The classification has evolved to such an extent that it considers the conditions which are congenital in nature, conditions due to abnormal ovum and sperm (indicating genetic conditions), diseases due to injury (*Adhibhautika*). The method of enumeration of each disease with its subtypes, and distinction between manageable (*Sadhya*) and difficult to manage having very bad prognosis (*Asadhya*) is another proof of mature medical nosological thinking in *Ayurveda*. The hall mark of feature of Ayurveda which is its holistic approach is appreciated when it advocated the use of *Dashavidha pariksha* (ten fold diagnosis) which lays emphasis on collecting every details pertaining to the individual bring the focus on the individual biography, providing links to his/her disease. In doing so, *Ayurveda* never lost track to understand the nature, strength of nature, and finally advocates treatment taking both (biography and nosography) into consideration.

On the contrary, the western medicine especially in Greeco-roman medicine we find a transition from Magical remedies to Biographical approach and finally to the nosological approach which has finally lead to the development of current Biomedicine.

Understanding this subject is of utmost important as we are now heading for a major revision of ICD-10, which is going to be functional from the year 2014, which is followed by another major revision ICD-11, which is going to include standard terminology of some of the alternative medical systems like Chinese and Korean medicine.

An attempt is made in this to document the chronicle of developments which has led to current International Classification of Diseases (ICD) and also provides glimpses of concept of disease and attempts to provide amicable classifications from *Ayurveda*.

Approach to disease classification in Ayurveda:

"*Ayurveda*" the *Upaveda* of *Atharavana* veda has dealt in detail with the human health and disease. The very objective of this applied *Vedic* discipline is maintenance of health of the healthy and provide succor to the suffering of the ailing. The approach is far more evolved and is very much holistic in nature. Unlike then western medicine where it took almost 1500 years to make a transition from Natural History method (Hippocratic approach 4 AD) to Pathographic/Nosographic approach (Sydenham 16th Century). *Ayurveda* has the advantage of having advantage of codified texts and presents the description of tight classification methodology from the very classification of medical specialties in to 8 types (*Ashtangas*) which include the specializations like *Kayacikitsa* (general medicine), *Shalya* (surgery), *Shalakya* (ear, nose, throat, dental and diseases of head), *Balaroga* (pediatrics), etc., which obviously have followed the same spirit into categorization of diseases too. Apart from this the basis of disease understanding is Pathophysiological (*Dosha-dhatu-mala*) and the analysis based up on *Triskandha* (three arms) 1. *Hetu* (cause), 2. *Linga* (presentation) and

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3. *Aushadha* (suitable regimen). The broad scheme for therapeutic classification of diseases is as follows:

1. ***Yuktivyapashraya*:** Management of disease based on thorough pathophysiological and suitable pharmaco therapeutic approach and laid emphasis on strict adherence to nosography (depiction of disease presentation in a structured manner).

2. ***Satvavajaya*** (mental mapping and understanding persons psyche): It provides basis for biographic (detailed personal history recording and counseling) approach.

3. ***Daivavyapashraya*:** It is interesting to find out that the third dimension, magico-remedial approaches (*Daivavyapashraya- Mani*, *Mangala*, *Homa* etc.,) were reserved for managing large scale epidemics where community participation is expected and were by and large meant for evacuations or self containing quarantining systems to prevent the further spread of the epidemic.

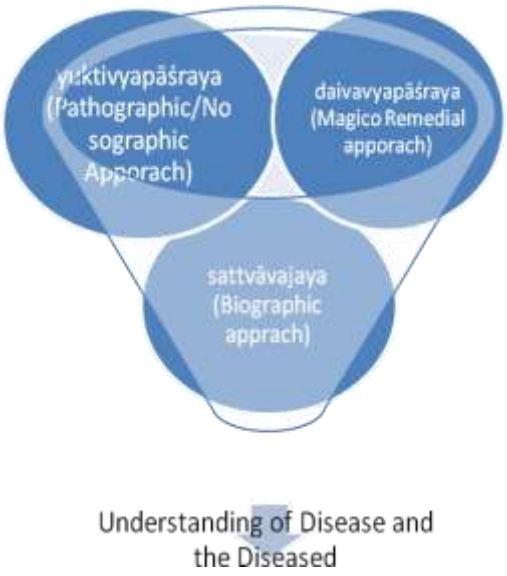

Figure No: 1

1. The *Ayurvedic* term for disease is *roga*. It has also been called *vyadhi*, *atanka*, *vikara*, *gada* and *duhka*. Every living being has three aspects, the body mind and soul. Of these three, only body and mind are the abodes of disease (*ca. su*. 1/43). (3)

Synonyms of the disease in *Sanskrit* represent a wide variety of expressions and provide the glimpse of Physiological, pathological, biographical, nosological background for the same. Some of the widely known synonyms are as follows: *Roga* (which gives pain), *Papma* (a disease caused due to sinful acts), *Jvara* (because it torments), *Vyadhi* (it brings in different kinds disorders), *Vikara* (it brings in different kinds of abnormalities it causes various kinds), *Duhkha* (it causes various kinds of sadness), *Amaya* (it is caused by *Ama*), *Yakshma* (means few symptoms together indicate a disease), *Atanka* (it makes life miserable), *Gada* (it is produced by multiple causes), *Abadha* (it causes constant physical or mental discomfort) (a. hru. *ni*. 1/1). (4)

2. Evidence of Systematic classification based on Pathology of disease is dealt in Ashtangahrudaya (*a. hru. ni.* 1/8) (5), *Madhava nidana* (*ma. ni.* 1/10-13) (6) in the *Samprapti* (the process of production of disease) discussion section. Here the texts mention about the classification of morbid conditions by number - *Sankhya*. Permutations and combinations of the disease entities involve- *Vikalpa*; primary and secondary involvement of disease process by *Pradhanya*; consideration for severity of the disease based on prodromal- severity of the disease depicted by *Bala* (strength of the disease) and disease development based on the time- *Kala*; Among these the classification of morbid conditions by number- *Sankhya* tries to enumerate possibility of a disease types and subtypes.

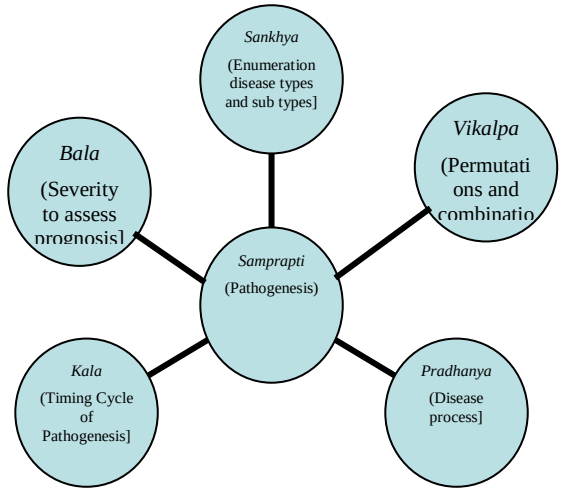

Figure No: 2

The scheme of Classification of diseases according to *Ayurveda*:

Ayurveda considers that diseases are innumerable in number, therefore they cannot be kept under a single group or category. It is difficult to adopt any single method for diseases classifications or grouping, to solve problem, diseases and disease conditions are categorized after evaluating several norms. Some of the well adopted schemes are as follows:

1. **Disease is only one:** Disease as interpreted as pain or discomfort is common to all diseases (ca.su.20/3). (7)
2. **Two types:** Based on the prognosis i.e *Sadhya*- managable, *Asadya*- difficult to manage or incurable. Based on the ease of management the *Sadhya* conditions are further classified into 1. *Sukha sadhya* (easily manageable), *Krucchra sadhya* (manageable with difficulty); the *Asadhya* ones are classified to 1. *Yapya* (conditions which need lifelong management), 2. *Pratyakhyeya*- completely unmanageable (*ca. su*. 10/9-10; 18/41). (8)
3. **Three types:** 1. *Nija* (Caused solely due to derangement of *Dosha dhatu* i.e. physiological disturbances/endogenous), 2. *Agantuja* (Caused due to external factors injuries, accidents/exogenous) 3. *Manasa* (psychological imbalance) (ca. su. 11/45; 20/7) (9); this also covers the disease category based on the vitiation of three *Doshas* (*Vata*, *Pitta* and *Kapha*) (ca. su. 20/3). (10) It provides the basis for two abodes for the disease i.e *Sharira* (Physiological disturbance physical body) and *Manasa* (mind).

Another set of classification with three divisions is as follows:

I. *Adhyatmika* (physical and psychic type, constitutional) 2. *Adhibhautika* (caused by environment) 3. *Adhidaivika* (caused by presumed supernatural agents) the same classification has been elaborated into seven categories in the later classification dealt in *Sushruta samhita*.

II. Four types: *Adhyatmika*, *Adhibhautika*, *Adhidaivika* and *Svabhavika* (by nature) is added by (*su. su*. 24/4). (11) - Which covers conditions like hunger, thirst, old age and death.

III. Based on the possible mode of management i.e medical or surgical diseases are classified in to two categories 1. *Shastrasadya* - surgically manageable 2. *Snehadikriya Sadhya*- manageable by medical means viz. by performing *Pancakarma* etc., (su.su. 24/4). (12)

IV. Seven types of disease: *Sushruta samhita* nicely sums up all the varieties of morbidity in the following seven categories which is still valid to current times (su.su. 24/4-5). (13)

1. ***Adibala pravrutta:*** Disease due to faulty sperm/ovum- indicative of genetic abnormalities.
2. ***Janmabala pravrutta:*** Indicative of congenital birth defects, due to improper prenatal/perinatal care.

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3. ***Doshabala pravrutta:*** Morbidity due to vitiated *dosha* (*Vata*, *Pitta*, *Kapha*; *Rajoguna* and *Tamoguna*)
4. ***Sanghatabala pravrutta:*** Diseases caused by exogenous factors viz., over physical excretion, stress etc.,
5. ***Kalabala pravrutta:*** Conditions due to exposure to the vagaries of weather- indicative of seasonal disorders /epidemics.
6. ***Daivabala pravrutta:*** Suffering due to divine wrath or other superhuman factors.
7. ***Svabhavabala pravrutta:*** Hunger, thirst, old age etc., which are unavoidable and are universal in nature.

Handling exceptions (*Ayurvedic* approach to handle new disease entity): (14)

Interestingly *Ayurveda* emphasizes on understanding the nature of the disease, the location of the disease and the causative factor (ca.su.18/44-47). (15) and need not bother about the name, if at all he/she is not aware of it at that time. Naming can follow the treatment, but understanding the underlying pahtophysiology is of utmost importance. *Caraka samhita* states: a physician need not be ashamed if he is unable to name a particular disease. It is not possible to always assign a name to a disease with certainty. An aggravated *dosha* may cause different ailments depending on the causative factors and the location o the disease (*ca. su.* 18/44-47). (16)

Examples of Nosological entities from *Ayurvedic* Classics:

A. Based on Absolute *Doshic* involvement:

1. 80 *Vataja nanatmaja* diseases described in *caraka sutrasthana* 20/11 (17); *Sharngangadhara purvartha* (*Sharnga. Pu.* 7/105-114) (18); *a .sam. su.* 20/15 (19); *a. hru. su. a. ra.* 12/53 (20); *ka. su.* 27/22-33 (21)
2. 40 *Pittaja nanatmaja* diseases described in *ca. su.* 20/14 (22); *Sharnga*. *pu*. 7/115-121 (23); *a. sam. su.* 20/16 (24); a. hru. su. *a. ra.* 12/53 (25); *ka. su.* 27/34-40 (26)
3. 20 *Kaphaja nanatmaja* diseases described in ca. su. 20/17 (27); *Sharnga*. pu. 7/122-124 (28); *a. sam. su.* 20/17 (29); *a. hru. su*. *a. ra.* 12/53 (30); *ka. su.* 27/41-46 (31)
4. 10 *Raktaja* diseases are described in *Sharnga*. *pu*. 7/125-126 (32); *ka. su*. 27/62-65 (33); *ca. su.* 24/11-17 (34) and *ca. su.* 28/11-13 (35) also *raktaja* diseases are found.

B. Based on Dhatu (Tissue Involvement):

The features (equating to the status of individual disease entities) of decrease of *dhatu* are described in the *Sushruta sutra* 14/10-12 (36) and *Ashtanga hrudayam sutrasthana* 11/17-20 (37); The features of increase of *dhatu* mentioned in *Sushruta sutra* 14/10-12 (38) and *Ashtanga hrudayam sutrasthana* 11/8-12 (39)

C. *Sroto dushti*: Signs of vitiation of various channels of circulations are described in the *Caraka, vimana sthana* 5/7-8. (40)

D. The eight types of **abnormal physical features** (constitutions) *Ashtanindita purusha* - which deptic the gross hormonal disturbances like hirsutism, cretinsm and gigantism etc., described in the *Caraka sutrasthana* 21/3 chapter. (41)

E. Samanyaja vikara (Conditions pertaining to General medicine (*Kayacikitsa*): This section includes diseases which generally having the tendency to affect the whole body. The number enumerated from selected *Ayurvedic* works is a follows:

- *Carakasamhita* -48 (*ca. su.* 19/3) (42)
- *Madhavanidana* -69
- *Sharngadharasamhita* -65
- *Bhavaprakasha* -71
- *Yogaratnakara* -74

Jvaradirogoddesha (43)

F. Diseases based on Body Location: *Shiroroga* (diseases of head and scalp), *Mukharoga* (oral and dental disorders), *Karnaroga* (ontological conditions), *Netraroga* (eye disorders) *Nasaroga* (diseases of nose). The comparison of number of these diseases from selected *Ayurvedic* works is as follows:

	Shiroroga (diseases of head- ICD-C76.0)	*Mukharoga* (diseases of oral cavity-ICD-Block:K00-K14)	*Karnaroga* (diseases of ear-ICD-Block:H60-H95)	*Netraroga* (diseases of eye-Block:H00-H59)	*Nasaroga* (diseases of nose:J30.0-J31.0)
Caraka	5 (*ca. ci.* 26/118) (44)	4 (*ca. ci.* 26 /119-123) (45)	4 (*ca. ci.* 26 /127-128) (46)	4 (*ca. ci.* 26/129-131) (47)	4 (*ca. ci.* 26 /104-107) (48)
Sushruta	11 (*su. u.* 25-26) (49)	65 (*su. ci.* 22) (50)	28 (*su. u.* 20) (51)	76 (*su. u.* 1/29-43) (52)	31 (*su. u.* 22,23) (53)
Vagbhata	9 (*a. hru. u.* 23) (54)	75 (*a. hru. u.* 21) (55)	25 (*a. hru. u.* 17,18) (56)	94 (*a. hru. u.* 8-16) (57)	18 (*a. hru. u.* 19) (58)
Sharangadhara	10 (*sharnga. pu.* 7/149-152) (59)	74 (*sharnga. pu.* 7/127-133) (60)	16 (*sharnga. pu.* 7/142-146) (61)	94 (*sharnga. pu.* 7/153-170) (62)	18 (*sharnga. pu.* 7/147-148) (63)
Bhavaprakasha	11 (*bha. pra. ma.* 62) (64)	67 (*bha. pra. ma.* 66) (65)	28 (*bha. pra. ma.* 64) (66)	78 (*bha. pra. ma.* 63) (67)	34 (*bha. pra. ma.* 65) (68)
Yogaratnakara	11 (*yo. ra. shiroroga*/4) (69)	67 (*yo. ra. mukha roga*/3-4) (70)	28 (*yo. ra. karnaroga*/3-5) (71)	76 (*yo. ra. netraroga*/3-4) (72)	34 (*nasaroga*/3-5) (73)

Classification of Morbidity - Biomedical Perspective:

Evolution of Nosography (The systematic description of diseases.) and Nosology in Biomedicine (Pre Hippocratic time to 18th century) (74)

Three Main phases could be distinguished in the evolution of concepts of Nosology.

1. Pre-Biographic approach:

Significant feature of primitive or magic medicine and the source of understanding the basis of disease here are completely isolated from the ailing (patient) and by largely depend up on supernatural diagnosis, prognosis and therapy. (75)

2. Biographic Approach (Natural Medicine):

"The greatest step ever made in the history of medical thought was made at the very moment when the physician or his forerunner turned to the sick himself as to the source of therapeutically endeavor. This step was made by the Greeks. It marked the birthday of natural medicine based on observation. But here two ways were open. The physician could focus his attention exclusively on the present state of the patient, his sufferings and functional deficiencies. It seems that a healing art based on the study of symptoms alone, was practiced by the school of Knidos. If, however, the physician was driven to an investigation of the genesis of the present state of his patient, he was bound to take a clinical history which is not a simple

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enumeration of events succeeding each other in the march of time, by pure chance: the clinical history springs from causal thought, it is an intelligible whole of connected phenomena succeeding each other with necessity; it still is one of the mightiest instruments of etiology. It is this rational and historical approach which distinguished Hippocratic medicine as practiced by the school of Kos. The historian Thy kidides was believed to have obtained instruction in methods of historical research from the physician Hippocrates". (76)

After reaching this stage of medical thought, the physician no longer was in need of observing movements of the stars, and other completely unrelated events to the patient and also to the disease. This though process has lead to documentation and understanding of systematic natural etiology, diagnosis and prognosis.

To achieve this, the Hippocratic school of thought has laid emphasis on very taking a detailed clinical history and investigations on the broadest scale, listing origin, age, marital state and profession of the patient. If needed, patient's psycho-physical development records from, school record, home life, work record, special interests, social activities and views on human life and nature of the patient are recorded in detail. This approach still finds its place in Homoeopathic disciple where great emphasis is made on recording Patients personal biographical account. This approach began during Hippocratic medicine and lasted till 15th century.

3. Nosography and Pathography Approach:

When patterns of disease started emerging from careful observation of history of previous illness and the present state of suffering, the focus of understanding shifted from biography to pathography. Pathography indicated the understanding of a selected phase of person's life history distinguished by his illness with all its distinguishing features enabling it to be called as so and so disease. (77)

Once such patterns were recognized and started correlating with other similar ones the new phase of medical history of the patient from a mere biographical one has metamorphosed to a case history. At this stage the physician has passed to nosography. At this juncture the diseases is recognized as an entity which can be independently traced to a persons' health condition even with having may of other details (which was a classical feature of detailed biographical approach). This approach of disease classification allowed physician to understand the underlying pathology and decide the management strategy with better predictability. From this stage onwards the nosographer started outlining scheme of classification of diseases or diagnoses. This phase has begun in early 16th century with the contribution of medical stalworts like Sydenham (England) and continues till 20th century.

Today (21 century) we see a clear turn around as it is realized now that just depending up on either of biographic or nosographic approaches cannot offer comprehensive treatment modalities. An exclusive emphasis on nosographic approach and related treatment strategies has lead to lot of misuse especially in the area of Medication. Lack of specificity with respect to individual prescriptions and prevalence of non communicable diseases have forced the researchers of medicines to add another dimension in the form of Genomics. This descipline hase been added make the medicine more personalized and brought back the biographic apporach to health in the modern medical treatment albiet with with more precision. A schematic representation of the scheme of events is depicted in Figure no. 3.

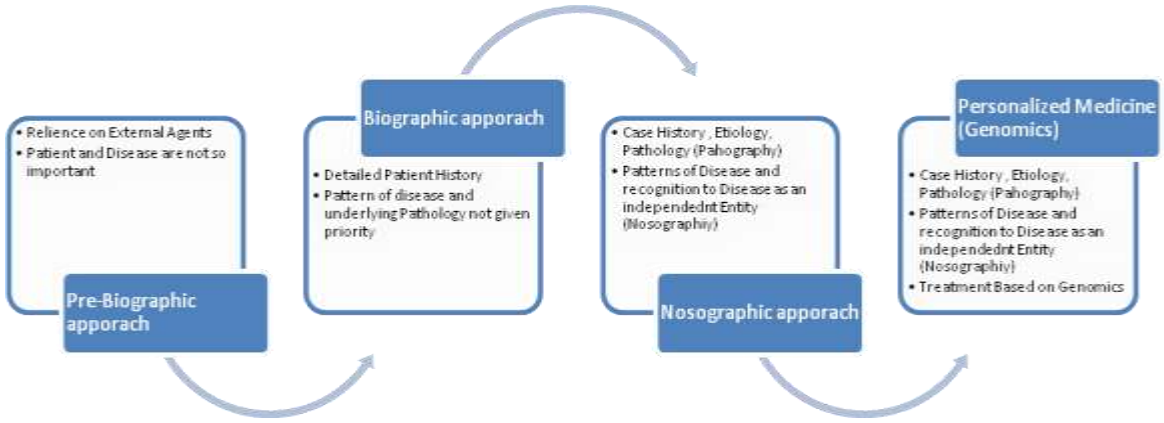

Figure no. 3

Contemporary developments in Disease Classification and Coding (19 century onwards)

The history of medical coding, or diagnostic coding, dates back to seventeenth-century Great Britain with the London Bills of Mortality. (78)

The following developments in the domain are presented in the following table no. 1

International Classification of Disease:

The International Classification of Diseases (ICD) is a system developed collaboratively between the World Health Organization (WHO) and 10 international centers so that the medical terms reported by physicians, medical examiners, and coroners on death certificates can be grouped together for statistical purposes. The purpose of the ICD and of WHO sponsorship is to promote international comparability in the collection, classification, processing, and presentation of mortality statistics. Revisions of the ICD are implemented periodically so that the classification reflects advances in medical science. Since 1900, the ICD has been modified about once every 10 years, except for the 20-year interval between the last two revisions, ICD-9 and ICD-10. Effective with deaths occurring in 1999, the United States replaced ICD-9, in use for deaths from 1979 to 1998, with ICD-10. Publications showing mortality data coded under ICD-10 will differ substantially from those under ICD-9 because of changes in coding rules, changes in category names and ICD numbers, and changes in the tabulation lists used to group mortality data. This report will briefly review the history of ICD, highlight major changes in ICD-10, and discuss the statistical impact the revision will have on mortality analysis. (79)

Table No. 1 Important Dates:

Year	Event	Details
1660	London Bills of Mortality	John Graunt (80)
1759	Genera morborum by Linneaus (1707-1778)	The life of Sir Charles Linnaeus: knight of the Swedish Order of the Polar... P.220 By Dietrich Heinrich Stoever. (81)
1763	Nosologia methodica	Sir George Knibbs, the eminent Australian statistician, credited François Bossier de Lacroix (1706-1777, also known as Sauvages, with the first

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		attempt to classify diseases systematically. (82)
1785	Synopsis nosologiae methodicae	William Cullen (1710-1790) (83)
1837	General Register Office of England and Wales	William Farr (1807-1883) First medical statistician – *General Register Office of England and Wales* - he made the best possible use of the imperfect classifications of disease available at the time, and 2 laboured to secure better classifications and international uniformity in their use. (84)
1853	first International Statistical Congress, held in Brussels	The Congress requested William Farr and Marc d'Espine, of Geneva, to prepare an internationally applicable, uniform classification of causes of death. (85)
1855	Second International Statistical Congress	Farr and d'Espine submitted two separate lists. Farr's Classification (Five Groups): epidemic diseases, constitutional (general) diseases, local diseases arranged according to anatomical site, developmental diseases, and diseases that are the direct result of violence D'Espine classification: diseases according to their nature (gouty, herpetic, haematic, etc.). The Congress adopted a compromise list of 139 Rubrics. (86)
1864	classification was revised in Paris on the basis of Farr's model	
1874, 1880, and 1886	Subsequent revisions	Note: Although this classification was never universally accepted, the general arrangement proposed by Farr, including the principle of classifying diseases by anatomical site, survived as the basis of the International List of Causes of Death. (87)
1893	Bertillon Classification	International Statistical Institute approved a standardized system for classifying deaths. List was prepared by a Paris statistician, Jacque Bertillon (1851-1922, and was called the Bertillon Classification By 1900, 26 countries had implemented the Bertillon Classification. (88)
1898		American Public Health Association, at its meeting in Ottawa, Canada, recommended the adoption of the Bertillon Classification by registrars of Canada, Mexico, and the United States of America. The Association further suggested that the classification should be revised every ten years. (89)
1899	meeting of the International Statistical Institute at Christiania	Bertillon presented a report on the progress of the classification, including the recommendations of the American Public Health Association for decennial revisions. (90)
August	first International	Delegates from 26 countries attended this

1900	Conference for the Revision of the Bertillon or International List of Causes of Death	Conference. A detailed classification of causes of death consisting of 179 groups and an abridged classification of 35 groups were adopted on 21 August 1900. The desirability of decennial revisions was recognized, and the French Government was requested to call the next meeting in 1910. In fact the next conference was held in 1909, and the Government of France called succeeding conferences in 1920, 1929, and 1938. (91)
1923		International Statistical Institute, Michel Huber, Bertillon's successor in France, recognized this lack of leadership and introduced a resolution for the International Statistical Institute to renew its stand of 1893 in regard to the International Classification of Causes of Death and to cooperate with other international organizations in preparation for subsequent revisions. (92)
1928	Study on “Expansion of Bertillon Classification”	Study sponsored by the Health Organization of the League of Nation discussed how the Bertillon Classification could be expanded to include the tracking of diseases. (93)
1928	Commission of Statistical Experts	E. Roesle, Chief of the Medical Statistical Service of the German Health Bureau and a member of the Commission of Expert Statisticians, prepared a monograph that listed the expansion in the rubrics of the 1920 International List of Causes of Death that would be required if the classification was to be used in the tabulation of statistics of morbidity. (94)
1936	A Standard Morbidity Code was prepared by the Dominion Council of Health of Canada.	other classifications The main subdivisions of this code represented the eighteen chapters of the 1929 Revision of the International List of Causes of Death, and these were subdivided into some 380 specific disease categories. (95)
October 1938	Fifth Decennial Revision Conference by the Government of France and was held in Paris.	The Conference approved three lists: a detailed list of 200 titles, an intermediate list of 87 titles and an abridged list of 44 titles. (96)
1942	Committee on Hospital Morbidity Statistics of the Medical Research Council was created in UK to *A provisional classification of diseases and injuries for use in compiling morbidity statistics.*	

1944	Provisional classifications of diseases and injuries were published in both the United Kingdom and the United States of America for use in the tabulation of morbidity statistics.	
1944.	*The Manual for coding causes of illness according to a diagnosis code for tabulating morbidity statistics*, consisting of the diagnosis code, a tabular list of inclusions, and an alphabetical index.	
1945	Committee on Joint Causes of Death under the chairmanship of Lowell J. Reed, Professor of Biostatistics at Johns Hopkins University.	Proposed single list of conditions instead of separate ones for morbidity and death.
1946	Sixth Revision of the International Lists	International Health Conference held in New York City entrusted the Interim Commission of the World Health Organization
26 to 30 April 1948	International Conference for the Sixth Revision of the International Lists of Diseases and Causes of Death.	
1948	the First World Health Assembly endorsed the report of the Sixth Revision Conference and adopted World Health Organization Regulations No. 1, prepared on the basis of the recommendations of the Conference.	*Manual of the International Statistical Classification of Diseases, Injuries, and Causes of Death;* The Manual consisted of two volumes, Volume 2 being an alphabetical index of diagnostic terms coded to the appropriate categories.
1949	The Manual of the International Classification of Diseases, Injuries and	World Health Organization (WHO) realized the idea of enacting a system for tracking mortality as well as causes of diseases on a global basis. (97)

	Causes of Death (ICD)	
February 1955	The International Conference for the Seventh Revision of the International Classification of Diseases was held in Paris under the auspices of WHO.	this revision was limited to essential changes and amendments of errors and inconsistencies
6 to 12 July 1965	The Eighth Revision Conference convened by WHO met in Geneva	During the years that the Seventh and Eighth Revisions of the ICD were in force, the use of the ICD for indexing hospital medical records increased rapidly and some countries prepared national adaptations which provided the additional detail needed for this application of the ICD.
30 September to 6 October 1975	The International Conference for the Ninth Revision of the International Classification of Diseases, convened by WHO, met in Geneva	The final proposals presented to and accepted by the Conference retained the basic structure of the ICD, although with much additional detail at the level of the four-digit subcategories, and some optional five-digit subdivisions. For the benefit of users not requiring such detail, care was taken to ensure that the categories at the three-digit level were appropriate. (dagger and asterisk system) Classifying diagnostic statements, including information about both an underlying general disease and a manifestation in a particular organ or site.
1989	Tenth Revision	
1993	ICD-10 being in use from this period	
October 1, 2013		target date for full execution of ICD-10-PCS, which is the American version of the new coding.
Road ahead	11th Revision (98)	To produce an international standard for information on TM that is ready for electronic health records and that will serve as a standard for scientific comparability and communication. Deliverables: 1. International Classification of Traditional Medicine; 2. International Standard Terminologies of Traditional Medicine; 3. A web portal that links the TM classification and TM terminologies to the WHO-FIC

Note: The Twenty-ninth World Health Assembly, noting the recommendations of the International Conference for the Ninth Revision of the International Classification of Diseases, approved the publication, for trial purposes, of supplementary classifications of Impairments and Handicaps and of Procedures in Medicine as supplements to, but not as integral parts of, the International Classification of Diseases.

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Designation Years in Effect: (99)

Table No 2: Types of medical coding: Different types of medical coding systems available are enlisted

ICD-1	1900-1909
ICD-2	1910-1920
ICD-3	1921-1929
ICD-4	1930-1938
ICD-5	1939-1948
ICD-6	1949-1957
ICD-7	1958-1967
ICDA-8 (adapted)	1968-1978
ICD-9	1979-1998
ICD-10	1999- ongoing

Table No. 3: current medical classifications in practice

Medical coding method	**Details**
Current Procedural Terminology (CPT) & Healthcare Common Procedure Coding System (HCPCS)	CPT was initially developed by the American Medical Association back in 1966. CPT codes are updated on an annual basis. HCPCS codes have two tiers of coding. The HCPCS is the coding system that is used for outpatient procedures and doctor services. The HCPCS has two levels of coding. Level I is based on the AMA's CPT system. Level II HCPCS codes are used by medical suppliers, ambulance services or medical equipment vendors.
International Classification of Diseases (ICD)	
International Classification of Diseases, Clinical Modification (ICD-9-CM)	It is the uniformed system for gathering information regarding inpatient procedures in hospitals. (100)
The International Classification of Functioning, Disability and Health (ICF). (101)	
The Diagnosis Related Groups (DRG)	An effort to gain uniformity in the area of diagnostics
The Code on Dental Procedures and Nomenclature (CDT). (102)	
Statistical Manual of Mental Disorders (DSM-IV-TR) (103)	
National Drug Codes (NDC) (104)	It has been instrumental in developing consistency and standardization of prescriptions drugs.

Developments in Ayurveda ontology:

Madhavanidana (premier book on Disease classification in *Ayurveda*) and its nosological contributions:

1. The grouping of diseases in tune with *Ashtanga ayurveda* in

Meulenbeld has postulated that "*Madhavanidana* (*Roavinishcaya*) presents the classification of disease in compliance with six of *Ashtangas* excluding *Rasayana* and *Vajikarana*" (105). The arrangement the groups are as follows:

Kayacikitsa (General medicine)	chapters 2-19, 22-37, 49-54)
Bhutavidya (Possession and altered psychology)	chapters 20-21
Shalya (Surgery)	chapters 38-38 and 55
Shalakya (Ear, Nose and Throat)	chapters 56-60
Kaumarabhrutya (Mother and Child care)	chapters 61-68
Agadatantra (Toxicology)	chapters 69

***2. Madhavanidana's* unique chapters** (106)

- *Daha* (A syndrome characterized by a burning sensation; *ma. ni.* 19 (107); ICD- F45.3)
- *Nadivrana* (Fistulas; *ma. ni.* 45 (108); ICD-K60.3-K60.5)
- *Upadamsha* (Affections of the male member; *ma. ni.* 47 (109); ICD-Bolck:A50-A64)
- *Visarpa* (Erysipelas; *ma. ni.* 52 (110); ICD-Bolck:L00-L08)
- *Asrugdara* (Menorrhagia and metrorrhagia; *ma. ni.* 61 (111); ICD-N92.4)
- *Stanaroga* (Diseases of the mammary glands; *ma. ni.* 66 (112); ICD-N60-N64-2)

3. Madhavanidana's new clusters (113).

- *Nidra* (excessive sleepiness-ICD-G47.1), *Tandra* (Drowsiness-ICD-R40.0), *Murcha* (Syncope-ICD- R55) and *Sanyasa* (Coma-17; ICD- R40.2. *ma. ni. 17*) Page no: 200
- *Anaha* (Distension of abdomen due to obstruction to passage of urine and stools- ICD- R14) is described along with *Udavarta* (Upward movement of gases- ICD- R14; *ma. ni.* 27) (114)

4. Madhavanidana's addition of new disease entities: (115)**;** *Madhavanidana* has added new diseases which were not described in earlier texts or were just mentioned sketchily. These innovations became highly influential and were almost universally acknowledge by later writers. Disorders recognized as independent entities for the first time by *Madhava* are

- *Shula* (piercing, colic-like pain-ICD-R10-10.4; *ma. ni.* 26) (116)
- *Visphota* (diseases in which vesicles or blisters appear-ICD- T14.0; *ma. ni.* 53) (117)
- *Amavata* (Often equated with rheumatoid arthritis-Block:ICD-M60-M63; *ma. ni.* 25) (118) - Note: *Harita samhita* (III.21) also described it in its own way
- *Parinamashula* (a type of *Shula* manifesting itself during the digestion of food- ICD- K26-K28) and *Annadravashula* (which may appear during the digestive process or precede or follow it- ICD- K26-K28; *ma. ni.* 26/15-22) (119)
- *Medoroga* (obesity-Block:ICD- E65-E68; ma. ni. 34) (120)
- *Sitapitta* (Urticaria-Block:ICD- L50-L54; ma. ni. 50) (121) - three disorders closely related to *Shitapitta*, *Kotha* (an exanthematous, itching eruption- Block:ICD- L50-L54;), *Utkotha* (a special form of urticaria-Block:ICD- L50-L54;) are dealt in the same chapter.
- *Amlapitta* (Corresponding to a dyspepsia accompanied by vomiting and diarrhea or spitting or blood-ICD- K31.8-K31.9; ma. ni. 51) (122); elsewhere in other *Samhitas* this was considered as a symptom, but in *Madhava nidana* it gets the status of a separate disease. In this case it seems

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that *Harita samhita* has been influenced by this section and included it and the context dealing with this section in *kashyapa samhita* appears to be the original (*ka. khi.*16). (123)

- Mashurika (smallpox, chiken pox and other infectious, eruptive fevers-ICD-B01-B05) (*ma. ni.* 54) (124)
- *Shukaradamshtraka* (suppuration lesion of the skin with burning sensation of penis-ICD-C60.9) (*ma. ni. madhu.* 55/55) (125)
- *Khuncana* (Blepharospasm- ICD-G24.5) (*ma. ni.* 59/96) (126)
- *Pakshmashata* (Madarosis/Blepharitis-ICD- H02) (*ma. ni.* 59/99) (127)
- *Yonikanda* (Tuberous swelling in the vagina-ICD- N84- N84.9) (*ma. ni.* 63) (128)

New diseases described by other texts:

***Sharngadhara Samhita:* (13 A.D)**

The description of 4 types of *Amavata* (*Sharnga. pu.* 7/41) (129) and *Snayuka krimi roga* (*Sharnga. pu.* 7/18) (130) has been recognized for the first time.

***Bhavaprakasha:* (16 A.D)**

New diseases like *Mutratisara* (*bha. pra. ma.* 69/12) (131) (excess urination-ICD- R35- R36), *Shitala* (*bha. pra. ma.* 60) (132) (small pox-ICD- B03) added and a venereal disease *Phiranga roga* (*bha. pra. ma.* 59) (133) (Syphilis-Block:ICD- A65-A69) described as a separate chapter.

Apart from *Udararoga* (Abdominal diseases-Block:ICD- R10-R19), separate chapters has been mentioned to liver and spleen diseases in the *Plihadhikara* (bha. pra. ma. 33). (134)

Separated chapters of *Vata* (*bha. pra. ma.* 24) (135), *Pitta* (*bh. ma.* 27), *Kapha* (*bha. pra. ma.* 28) diseases, *Medoroga* (obesity- Block:ICD- E65-E68)(*bha. pra. ma.* 39) (136), *Karshya roga* (Tuberculosis-Block:ICD-A15-A19) (*bha. pra. ma.* 40) (137), *Somaroga* (polyuria in women-ICD-R35) (*bha. pra. ma.* 69) (138), *Upadamsha* (chancroid-ICD-Bolck:A50-A64) (*bha. pra. ma.* 51) (139), *Snayu roga* (guinea worm infestation-ICD- B72) (*bha. pra. ma.* 57) (140) has been described.

***Yoga ratnakara:* (18 A.D)** (141)

Vyavayi shosha (consumption due to excessive coitus- Block:ICD-A15-A19), *Kuranda* (Inguinal hernia-ICD- K40) disease and its treatment also described.

Sadyovrana (suddenly caused wound-ICD-T14), *Agnidagdha cikitsa* (Burns-Block:ICD- T20-T32), *Bhagna vrana* (Fracture with ulcer formation-ICD-M86), *Yauvana pithika* (Acne vulgaris-ICD-L70.0), *Nyaccha* (Naevus/mole-ICD-I78.1) and *Vyanga* (hyper pigmentation of skin-ICD-L81.4), *Padmini kantaka* (Papilloma of skin- ICD-B97), *Mudha garbha* (Mal-presentation of the foetus- ICD- O32- O32.9)- these diseases are described in separate chapters in detail.

***Bhaishajyaratnavali*: (19 A.D)** (142)

Detail description of the diseases like *Urustambha* (Stiffness in thigh muscles-ICD- G82.1) (28 ch.), *Pramehapidaka* (Diabetic carbuncle-ICD-L02- L02.9 (38 ch.), *Vruddhi* (Hydrocele-ICD-N43- N43.3) (43 ch.), *Galaganda* (Goiter-ICD- E01-E05) (44 ch.), *Sadyovrana* suddenly caused wound-ICD-T14 (48 ch.), *Udardashitapittakotha* (Urticaria-Block:ICD- L50-L54; (55 ch.), *Visarpa* (Erysipelas-ICD- A46) (57 ch.), *Visphota* (Blister- ICD- T14.0) (58 ch.), *Masurika* (Eruption of lentil-shaped pustules-ICD- L27) (59 ch.), *Pradara* (Leukorrhoea-ICD-N89.8) (66 ch.), *Garbhini* (pregnancy-ICD- O00.0- O30.8) (68 ch.), *Sutika* (Delivered woman - O80-O84) (69 ch.), *Stana* (Disorders of breast; Block:CD- N60-N64) (70 ch.), *Bala* (disorders of infant and child- ICD-Z76.2) (71 ch.) separate chapters.

Separate chapters with treatment of *Amashayaroga* (diseases of stomach and duodenum-Block:ICD-K20-K31) (76 ch.),

Gadodvega (78 ch.), *Tandavaroga* (81 ch.), *Snayuroga* (82 ch.), *Khalitya* (Alopecia-ICD-L65.9) (83 ch.), *Khanja* (Limping-ICD-I73.9) (84 ch.), *Urastoya* (Pleural effusion-ICD- J90) (85 ch.), *Bahumutra* (Polyuria-ICD- R35) (86 ch.), *Somaroga, Mutratisara* (Polyuria in women-ICD-R35-R36) (87 ch.), *Shukrameha* (88 ch.), *Aupasargika* meha (89 ch.), *Ojomeha* (AIDS-ICD-B24) (90 ch.), *Lasikameha* (91 ch.), *Dhvajabhanga* (92 ch.), *Vrukkaroga* (renal disorders-ICD-N00-N20.0) (93 ch.), *Klomaroga* (Pancreatic disorders-Block:ICD-K80-K87) (94 ch.), *Phiranga* (Syphilis-Block:ICD-A65-A69) (95 ch.), *Snayukaroga* (Guinea worm infestation-ICD- B72) (96 ch.), *Shirshamburoga* (Hydrocephalus-ICD-G91) (98 ch.), *Mastishkavepana* (Cerebral contusion-ICD-S00) (99 ch.), *Mastishkacayapcaya* (Cerebral palsy-ICD-G80)(100 ch.), *Mastishkaroga* (brain related disorders-ICD- G80- G81) (101 ch.), *Amshughata* (Heatstroke and sunstroke-ICD-T67.0) (102 ch.), *Yoshapatantraka* (Hysteria-ICD-F44) (103 ch.), *Yonikandu* (Vaginitis-ICD-N76.1) (104 ch.), *Andadhara* roga (Pain and other conditions associated with female genital organs and menstrual cycle-ICD-N94)(105 ch.), *Apamumurshu* (106 ch.).

Interdisciplinary Adaptation of Concept of Medical Codes – An alliance between Biomedicine and Traditional medicines for better Case records.

Mainstreaming of TM – Traditional Medicine from various countries has always been a priority with World Health Organization. It has been encouraging all the efforts to bring in scientific temper and ethical practice in these systems by promoting research and development on par with Biomedicine. The latest in such effort is considering International Classification of Traditional Medicine, adaptation of ICD like classification to TM which are expected to facilitate uniform case recording and possibly implementation of Electronic Health records. As of now TCM-Traditional Chinese Medicine and Korea medicine have been benefited from these initiatives. The widely practiced Indian Systems of Medicine Ayurveda, *Siddha* and *Unani* have are now considered for standardization of terminologies. World health organization (WHO) Agreement for Performance of Work (APW) has been taken up at National Institutes of *Ayurveda, Unani and Siddha* to come up with plausible standard clinical and non clinical terminologies to pave way for further coding. (143) Apart from these Central council for Research in Ayurveda Sciences (CCRAS) has initiated two projects 1. AYUSH Research Portal 2. Integrated Clinical Decision Support System (ICDSS) which are using ICD-10 codes and corresponding diagnosis with plausible *Ayurveda/Siddha/Unani* disease names.

Conclusion:

Health is a matter of Individual, Familial and State concern. No societies can survive and exist in harmony without having a proper health care system in place. Today we have a fairly evolved health care system across the world, but the status of its implementation is very diverse. There is a huge division in terms of availability of health care infrastructure between developed, underdeveloped countries and sometimes between two places in a single country itself. Use of rational methods, harmony with respect to use of standardized medical terms is a level player to communicate the ground realities and will help bridge this gap. All the efforts to develop and implement the usage of Medical Coding irrespective of medical discipline are the need of hour. Having developed the robust systems like International Classification of Disease

(ICD) and heading for implementation of its latest 10th revision, it is time for all Indigenous systems to catch up and standardize their own terminology (ICD-11). This effort will demonstrate the strength of AYUSH systems will fetch wider acceptance and long-term sustenance.

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List of abbreviations:

Abbreviation	**Expansion**
ca. su.	*Carakasamhita sutrasthanam*
ca. ci.	*Carakasamhita cikitsasthanam*
su. su.	*Sushrutasamhita sutrasthanam*
su. ci.	*Sushrutasamhita cikitsasthanam*
su. u.	*Sushrutasamhita uttaratantram*
a. hru. su. a. ra	*Ashtamgahrudaya sutrasthana, ayurveda rasayana vakya*
a. hru. ni.	*Ashtamgahrudaya nidanasthanam*
a. hru. u.	*Ashtamgahrudaya uttarasthanam*
sharnga. pu.	*Sharngadharasamhita purva khanda*
sha. pu.	*Sharngadharasamhita madhyama khanda*
bha. pra. ma.	*Bhavaprakashaḥ madhyama khanda*
yo. ra.	*Yogaratnakara*
ma. ni.	*Madhavanidanam*
ma. ni. madhu.	*Madhavanidana, madhukosha vakya*
ka. su.	*Kashyapasamhita sutrasthanam*
ka. khi.	*Kashyapasamhita khilasthanam*
I.C.D	International Classification of Disease
Ch.	Chapter

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