

## **CONCEPT OF BUDDHI, MANA AND MEMORY PROCESSES IN AYURVEDA**

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Received: 02-11-2013; Revised: 29-03-2014; Accepted: 31-03-2014

### **Abstract**

The memory is the process in which information is encoded, stored, and retrieved. Encoding allows information that is from the outside world to reach our senses in the form of chemical and physical stimuli. The thinking and intellectual power of brain has an unlimited measureless capacity. Buddhi (intellectual power of brain) is a powerful entity which retains the specific knowledge or the essence of the texts gained by reading, listening or repeating it. It does not only retain the knowledge but time by time whenever needed it has the ability to recall the same. In Ayurveda memory is more related with Buddhi (intellect) and Mana (mind). According to Charaka Manas (mind) is a separate sense organ and it has many functions, Charaka also mentions mind as the Shada-indriya (sixth senses). Retention of cognition takes place under the area of Medha (power of retention of knowledge / storage device). Whenever there are any stimuli the previously stored experiences come in mind and recollection happens with the help of Smriti (memory or recall). In modern science the memory and its processes is still undefined. The Ayurvedic philosophy of Mana (mind), Buddhi (intellect), Atma (sole) definitely plays an important role in the processes of cognition and memory.

**Key words:** Buddhi (intellect); Mana (mind); Smriti (memories); Memory processes.

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### *Cite This Article*

Chetan Gulhane, Anup Thakar. Concept of Buddhi, Mana and Memory processes in Ayurveda. *Ayurpharm Int J Ayur Alli Sci.* 2014;3(4):121-127.

## INTRODUCTION

Memory in animals probably evolved as a mechanism to retain information gathered by sense organs. In all vertebrates and most invertebrates, the brain is the centre of the nervous system. It allows them to collect information (sensory system), act on that information (motor system) and store the result for future reference (memory), thus effectively making life possible. It is a hugely complex organ, with an estimated 100 billion neurons passing signals to each other via as many as 1,000 trillion synaptic connections.<sup>[1]</sup> It continuously receives and analyzes sensory information, responding by controlling all bodily actions and functions. It is also the centre of higher-order thinking, learning and memory, and gives us the power to think, plan, speak, imagine, dream, reason and experience emotions.<sup>[2]</sup> In more physiological or neurological terms, memory is, at its simplest, a set of encoded neural connections in the brain.<sup>[3]</sup> It is the re-creation or reconstruction of past experiences by the synchronous firing of neurons that were involved in the original experience. Our memories are not stored in our brains like books on library shelves, but are actually on-the-fly reconstructions from elements scattered throughout various areas of our brains.

In Ayurvedic science the concept of Smriti (memory) is more related with Buddhi (intellect), Mana (mind), and Medha (power of retention of knowledge). While describing the list of Atmaja Bhavas (factor associated with soul), Acharya Charaka has clearly mentioned Dharanam (retention), Dhrti (resolution), Buddhi (intellect), Smriti (memory).<sup>[4]</sup> Sushruta has clearly included Gnyana-Vignyan (science of knowledge) in the Atmaja Bhava too (factor associated with soul).<sup>[5]</sup> Here commentator Gangadhara, while explaining the word Dharana (retention), says It is that which is retained for a long time by Manas (mind). Thus Medha (power of

retention of knowledge) is the Bhava (factor) of Atma (soul) which is manifested during gestation.<sup>[6]</sup> Mana (mind) plays an importance role in the process of retention of knowledge and it also coordinates the external environment with the brain through the different Gyanendriyas (sense organs).<sup>[7]</sup>

## Types of memory

### 1. Sensory Memory

Sensory memory is the shortest-term element of memory. It is the ability to retain impressions of sensory information after the original stimuli have ended. It acts as a kind of buffer for stimuli received through the five senses of sight, hearing, smell, taste and touch, which are retained accurately. Sensory memory is an ultra-short-term memory and decays or degrades very quickly, typically in the region of 200 - 500 milliseconds (1/5 - 1/2 second) after the perception of an item, and certainly less than a second.

### 2. Short term Memory

Short-term memory acts as a kind of scratch-pad for temporary recall of the information which is being processed at any point in time, and has been referred to as the brain's Post-it note. It can be thought of as the ability to remember and process information at the same time. It holds a small amount of information (typically around 7 items or even less) in mind in an active, readily-available state for a short period of time (typically from 10 to 15 seconds, or sometimes up to a minute).

The term working memory is often used interchangeably with short-term memory; the central executive part of the prefrontal cortex at the front of the brain appears to play a fundamental role in short-term and working memory.

### **3. Long term Memory**

Long-term memory is, obviously enough, intended for storage of information over a long period of time. Despite our everyday impressions of forgetting, it seems likely that long-term memory actually decays very little over time, and can store a seemingly unlimited amount of information almost indefinitely. Short-term memories can become long-term memory through the process of consolidation, involving rehearsal and meaningful association.<sup>[8]</sup>

Long-term memory can be divided as procedural (implicit) and declarative (explicit) memory. Procedural memory is defined as information we possess, but cannot describe verbally. It refers to skilled performance, such as typing, riding a bicycle and playing a musical instrument. Historically, this type of memory was referred to as motor skills and involved study of how motor performance is learned. Declarative memory represents all knowledge that can be consciously accessed and expressed symbolically through speech or writing. It is believed that the incoming information is first held in sensory memory. By attention, the information will then be passed to working memory for processing.<sup>[9]</sup>

#### **Memory - Theories and processes**

Underlying memory improvement are a few basic concepts. In this article brief detail about theories of memory and some of the basic ideas to understand how certain techniques were improve the memory power. <sup>[10]</sup>

#### **1. Attention and election**

The first process of memory is attention. There is much more information in your environment than you can process at any one time. Thus, you must make choices (conscious and unconscious) regarding the stimuli to which you will attend.

### **2. Encoding**

Encoding is the crucial first step to create a new memory. It allows the perceived item of interest to be converted into a construct that can be stored within the brain, and then recalled later from short-term or long-term memory. Encoding is a biological event beginning with perception through the senses. The perceived sensations are decoded in the various sensory areas of the cortex, and then combined in the brain's hippocampus into one single experience. The hippocampus is then responsible for analyzing these inputs and ultimately deciding if they will be committed to long-term memory. There are three or four main types of encoding.

#### **Acoustic encoding**

Acoustic encoding is the processing and encoding of sound, words and other auditory input for storage and later retrieval.

#### **Visual encoding**

Visual encoding is the process of encoding images and visual sensory information. Visual sensory information is temporarily stored within the iconic memory before being encoded into long-term storage.

#### **Tactile encoding**

Tactile encoding is the encoding of how something feels, normally through the sense of touch.

Semantic encoding is the process of encoding sensory input that has particular meaning or can be applied to a particular context, rather than deriving from a particular sense. You may be able to remember information best if you use techniques (while retrieving the information) that are related to the way you encoded it.

### 3. Memory Consolidation / Storage

Consolidation is the processes of stabilizing a memory trace after the initial acquisition. It may perhaps be thought of part of the process of encoding or of storage. Storage is the process of holding information in your memory. A distinction is often made between short-term and long-term memory. It is usually considered to consist of two specific processes, synaptic consolidation (which occurs within the first few hours after learning or encoding) and system consolidation (where hippocampus-dependent memories become independent of the hippocampus over a period of weeks to years). Neurologically, the process of consolidation utilizes a phenomenon called long-term potentiating.

### 4. Memory Recall / Retrieval

Recall or retrieval of memory refers to the subsequent re-accessing of events or information from the past, which have been previously encoded and stored in the brain. In common parlance, it is known as remembering. During recall, the brain "replays" a pattern of neural activity that was originally generated in response to a particular event, echoing the brain's perception of the real event.

Attention → Encoding → Storage → Retrieval

Here are the steps of memory discussed thus far. First, you select the information to which you will attend. You then code the information for storage (where it can be practiced and processed more deeply). Later, when needed, information is retrieved by using a search strategy that parallels how the information was coded and stored.

### Ayurvedic concept Mana and Buddhi

Mana (mind) is must for the perception of subject or knowledge and in the absence of which no knowledge or perception occurs. The

objects which are perceived through the Indriyas (senses) are termed as Arthas (objects). Each Indriya (senses) has specific objects to perceive, not the else. In the same way Manas (mind) as being an independent Indriya (senses), it also has its own Manarthas (Objects of mind) which are of two types

#### 1. Indriya Sapeksha Karma

The functions performed with the conjugation and co-operation of Indriyas (senses) are Indriya Sapeksha Karma.

#### 2. Indriya Nirpeksha Karma

This includes such functions which are obtained only with the conjugation of Atma (soul) and Manas (mind). Indriyas (senses) have no role to perform it. Smriti (memories), Samadhi (deep absorption), Dharana (concentration), Yoga etc. are some examples of the Indriya Nirpeksha Karma.

Acharya Charaka has described five Vishayas of Manas (subjects of mind). Chintya (things requiring thought), Vicharya (consideration), Uhya (hypothesis), Dhyeya (attention), Samkalpa (determination) or whatever can be known by means of the Manas (Indriya nirapeksha), are regarded as its objects. (Table 1)<sup>[11]</sup>

### DISCUSSION

Memory is related to but distinct from learning, which is the process by which we acquire knowledge from the world and modify our subsequent behaviour. During learning process neurons that fire together to produce a particular experience are altered so that they have a tendency to fire together again. A neuron is an electrically excitable cell that processes and transmits information by electro-chemical signalling. Memories form when a pattern is repeated frequently, or in

**Table 1: Objects of Manas**

Objects	Nature of work
Chintya	This indicates internal perception. The thinking pattern, to think or to have an idea regarding any subject about to do or not to do with purposeful or purposeless prospective is called Chintya.
Vichara	It is Critical analysis based on observations or logical reasoning and logical discarding.
Uhya	Speculation and find out probabilities or Repeated thinking about desired issues.
Dhyeya	Attachment towards attaining knowledge means to concentrate or to pay complete attention on a particular subject.
Samkalpa	It includes doing various activities necessary to achieve a goal.

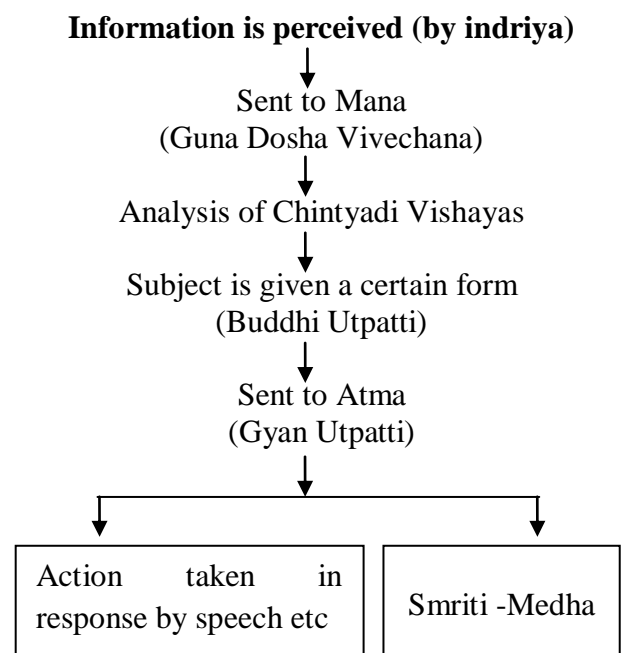
circumstances that encourage it to be encoded. This is because each time a group of neurons fires together the tendency to do so again is increased. Once the neighbour has been triggered to fire a chemical change takes place on its surface which leaves it more sensitive to stimulation from that same neighbour. This process is called long-term potentiation (LTP).<sup>[12]</sup>

Maharshi Charaka has mentioned eight causative factors of Smriti.<sup>[13]</sup> These eight are the reasons for recollection or the causative factors that revives the things which seem to be forgotten, back in the memory. In Ayurveda Budhhi (intellect), Medha (power of retention of knowledge) and Smriti (memories) are essential steps of memory process. The process of recollection takes place properly only and only after the Budhhi (intellect), Medha (power of retention of knowledge) and Smriti (memories) unites. So in this sense they are undifferentiated.

Almost similar process of memory is conducted by human brain. For the cognition sense objects conjoins with senses and senses with Manas (mind). Buddhi Vyapara (discrimination) follows just after it. Buddhi (intellect) works on it by reasoning and logic and reacts accordingly. If there is no action to be taken then it gains knowledge and gets stored for further use. Retention of cognition takes place under the area of Medha (storage device). In Ayurvedic classics the word 'Medha' has been used mainly in 2 ways viz.

Grahana shakti (grasping power) and Dharana shakti (retention power). When any stimulant comes, those stored experience comes in mind recollection happens with the help of Smriti (memories). Thus, in humans also if the knowledge or experiences are not encoded and retained properly then all the efforts of recalling would be in vain. So, Smriti (memories) needs systematic interpretation and retention. In this way Smriti (memories) is produced when encoding, retention and recollection of the experiences unites. In which Buddhi (intellect) helps in encoding, Medha (power of retention of knowledge) in retention and Smriti (memories) facilitate recollection.

**Functioning of Medha**



Medha (power of retention of knowledge) is the faculty of Buddhi (intellect) and Buddhi (intellect) is the Guna (property) of Atma (soul). It manifests with the combination of Atma (soul) and Manas (mind). So, Medha (power of retention of knowledge) can be said to be an inherent ability. In each individual, production of knowledge starts with the perception of the subject. Indriya (senses) perceives the subject and carry the information from the environment to the Manas(mind). Received information is given a certain form as it passes through the Chintana (things requiring thought), Vicharya (consideration), Uhya (hypothesis) etc. and is then sent to Atma (soul). After the knowledge is known by Atma (soul) it is stored in Medha (power of retention of knowledge), it transmigrates in another body along with Atma (soul) for many births.<sup>[14]</sup>

In short encoding is must in Smriti (memories), only those subject could be recalled which has been encoded before. In the same way if retained knowledge is not recollected it is of no use. After this description, it can be traced out that though Buddhi (intellect), Medha (power of retention of knowledge) and Smriti (memories) are having different meanings and functions they cannot work independently. But they work together and seem similar most of the times. Above discussion shows that Medha (power of retention of knowledge) is a broad term which comprises of the mental faculties like Buddhi (intellect) and Smriti (memories) also, which is again interrelated with each other and accordingly the Medha (power of retention of knowledge) can be subdivided into the following faculties.

- 1) Viveka Shakti (power of discrimination)
- 2) Grahana Shakti (power of grasping)
- 3) Dharana śakti (power of retention)
- 4) Smarana Shakti (power of recollection)

The functions of Manas can be arranged under following sequence –

### **Cognitive Processes (Gyanapradhana Vyapara)**

Cognition means to perceive. Manas send impulses and inspiration to the cognitive senses which facilitates them for the perception of objects.

### **Conative Processes (Chestapradhana Vyapara)**

Manas stimulates the Karmendriya to perform their functions.

### **Affective Processes (Bhavanapradhana Vyapara)**

Various emotions and feelings are the manifestation of Manas only.

In the Ayurveda classics Medha (power of retention of knowledge) is a faculty of Buddhi (intellect) or is a specific psychic ability which is responsible for encoding and retaining a large amount of knowledge.

## **CONCLUSION**

Mana (mind) is the most important Indriya (senses) in the processes of memory. Buddhi (intellect), Dhriti (retention) and Smriti (memories) are the words used as the synonyms of Medha (power of retention of knowledge). Acharya Charaka has mentioned to examine the Medha (power of retention of knowledge) by inference of Grahana Shakti (grasping). The subject is critically analyzed by reasoning and logic and then is understood by Dhi (retention power). This whole process of memory can be taken as Smriti-Vyapara that can be considered as grasping, retaining and recalling. These are the various stages of the Memory process.

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Source of Support: Nil

Conflict of Interest: None Declared