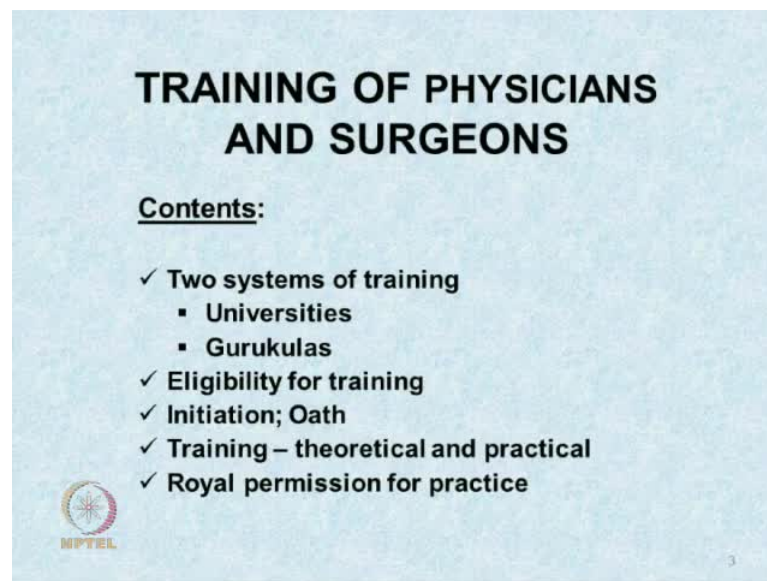


**Ayurvedic Inheritance of India**  
**Dr. M. S. Valiathan**  
**National Research Professor, Manipal University**  
**Indian Institute of Technology, Madras**

**Module - 7**  
**Lecture - 17**  
**Training of Physicians and Surgeons**  
**Selection of Students; Oath at Initiation; Process of Training**

In ayurveda the training of physicians and surgeons was much more than a teacher-student relationship, because the student was aware that he was being reborn as a physician, and the teacher was aware that he was shaping the life of a young physician. This imparts a certain amount of solemnity even sacredness to the whole process of training a young physician and surgeon. You will see this reflected throughout the process of selection of student, the initiation into medical training and every other aspect of the training of physicians and surgeons.

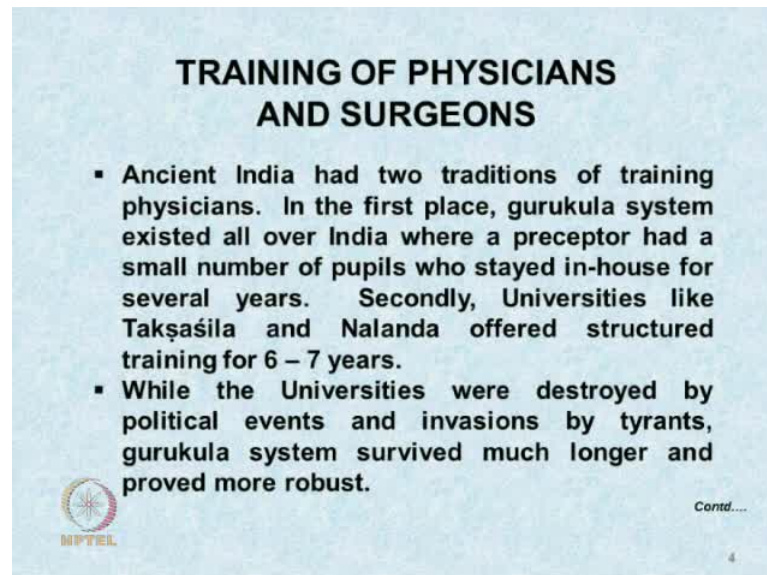
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We will be talking about essentially two systems of training which existed in ancient India. The university system based on well organized institutions and the second is large number of Gurukulas spread all over India where a teacher, a guru had a small number of disciple staying with him and going through a process of training. Then the eligibility for training, an extremely important subject, selection of candidates, the initiation into the training process, the training theoretical and practical and it is permission from the king


to start independent practice. These were different phases of the training and we will be dealing with them one by one.

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**TRAINING OF PHYSICIANS  
AND SURGEONS**

- Ancient India had two traditions of training physicians. In the first place, gurukula system existed all over India where a preceptor had a small number of pupils who stayed in-house for several years. Secondly, Universities like Takṣaśīla and Nalanda offered structured training for 6 – 7 years.
- While the Universities were destroyed by political events and invasions by tyrants, gurukula system survived much longer and proved more robust.

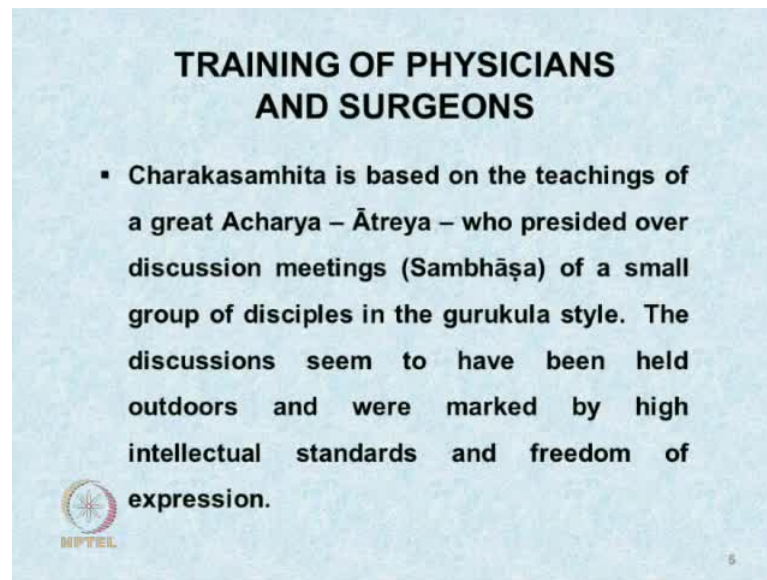
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Now we had two traditions of training; in the first place was the Gurukula which existed all over India where a preceptor had a small number of disciples and secondly there were universities specially Taksasila and Nalanda which offered structured training for 6 to 7 years. Now the universities by their very structure like Taksasila or Nalanda, they attracted a great deal of attention not only locally but also all over India neighboring regions and this attracted the attention of invaders who came to India and one of the first things they did was to destroy these great institutions.


Even today if a tyrant attacks a country and he wishes to destroy, the first thing they would do would be to destroy the universities and centers of learning. This is what happened in Taksasila, this is what happened in Nalanda many centuries later, and there are descriptions of the famous library of Nalanda burning for three months after the invader had attacked Nalanda. Fortunately the Gurukula system is much more widespread a kind of loosely structured, so they could survive these kind of murderous attacks by invaders.

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**TRAINING OF PHYSICIANS  
AND SURGEONS**

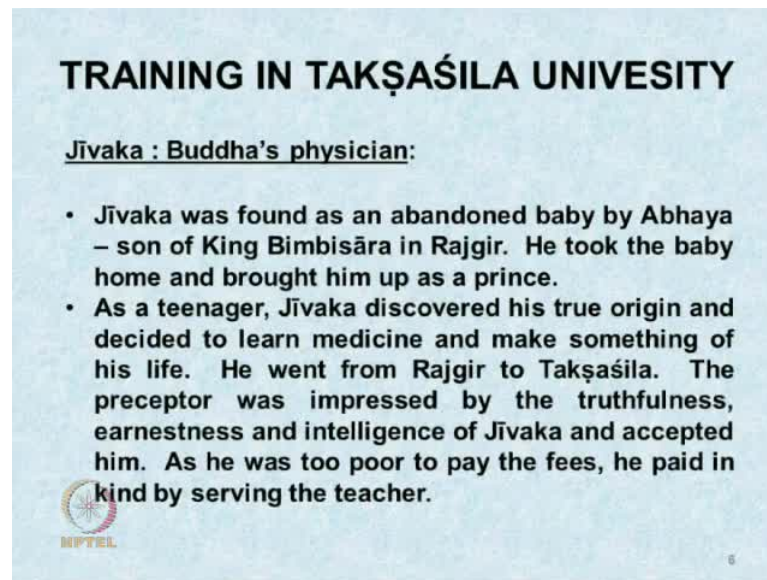
- **Charakasamhita is based on the teachings of a great Acharya – Ātreya – who presided over discussion meetings (Sambhāṣa) of a small group of disciples in the gurukula style. The discussions seem to have been held outdoors and were marked by high intellectual standards and freedom of expression.**

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And Charaka Samhita many of those chapters in Charaka Samhita you will find they are essentially a reflection of what happened in these Gurukulas. In the Charaka Samhita you would find in these discussions, Atreya is in the chair, and he has a small number of disciples sometimes 6, sometimes 10, and these were from many parts of India, from the names you can make out they came from neighboring regions of India, say, Afghanistan, etc. Now here the teacher himself, the guru would introduce a theme for discussion that day or it could be raised by one of the students, and there would be a vigorous discussion. The teachers point might be contested by the students, and finally the teacher or the guru would have a summing up at the end of the discussion.

This is how they end most of these discussions, free, vigorous, intellectually stimulating and some of those were discourses by the teacher, by the guru; that is what you see described in Charaka Samhita, and Atreya whose name figures in the Charaka; he was a teacher in probably the Taksasila university or somewhere in that area, and among his disciples was Agnivesha, one of the brightest students he had, he wrote Samhita and that is what Charaka redacted many centuries later. So, Charaka himself says at the end of every chapter, Agnivesha tanthre buda samskruthe; I am redacting the Agnivesha's tantra. Now this Agnivesha was a student of Atreya, so he is a historical figure.

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## TRAINING IN TAKṢAŚILA UNIVESITY

Jīvaka : Buddha's physician:

- Jīvaka was found as an abandoned baby by Abhaya – son of King Bimbisāra in Rajgir. He took the baby home and brought him up as a prince.
- As a teenager, Jīvaka discovered his true origin and decided to learn medicine and make something of his life. He went from Rajgir to Takṣaśila. The preceptor was impressed by the truthfulness, earnestness and intelligence of Jīvaka and accepted him. As he was too poor to pay the fees, he paid in kind by serving the teacher.

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And many of these discussions were held outdoors in the Himalayan country, very pleasant surroundings; that is where these discussions were often held. Now the best example of Taksasila university, fortunately, we have good descriptions of famous alumnus of Taksasila university that was Jivaka. He was found as an abandoned baby outside the palace of Bimbisara who was the king in Pataliputra. And Bimbisara son was Abhaya who was the prince, and one day when he was coming back to the palace in the morning, he found his baby lying on the footstep abandoned.

So, he took that baby inside the palace and brought him up as a prince, and as a teenager this prince who was a precautious child, Jivaka, that name was given by Abhaya, an unusual name, and he discovered that he was not really a prince; he was an orphan, then he decided I am not going to accept this, I will make something of myself. So, he decided to become a physician and he traveled all the way from Pataliputra to Taksasila at more than 2000 miles, and there he joined as a student, and the teacher accepted him without asking too many questions about his caste, about this that, and he never claimed that he was a prince. He said he had not enough money to pay, so he opted to serve the teacher in the university; that was an accepted practice in those days.

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### **STUDIES AT TAKṢAŚILA**

- ❖ Jīvaka's studies lasted 7 years: many stories exist about his extraordinary brilliance as a student.
- ❖ When he asked the teacher a few years later whether he was ready to practice, he asked Jīvaka to go around the township for 15 yojanas and come back with plants which had no medicinal use.

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And there he continued for 7 years as a trainee, and there are number of stories about his extraordinary performance as a student. These are all given in the Jataka tales; it is very interesting to read and when he finished his training he felt confident, he went and asked the teacher whether he was ready to practice. And the teacher told him I will give you little test, you go around this township of Taksasila 15 yojanas and come back with plants which have no medicinal value. This was the test given to Jivaka and he disappeared. After a few days he came back empty-handed, and the teacher asked him what happened? Where are the plants?

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### **STUDIES AT TAKṢAŚILA**

- ❖ After several days, Jīvaka returned empty handed and told the teacher "I could find no plant which had no medicinal use". He passed the test.
- ❖ His many surgical achievements, philanthropy, devotion to the Buddha are celebrated in Buddhist literature.

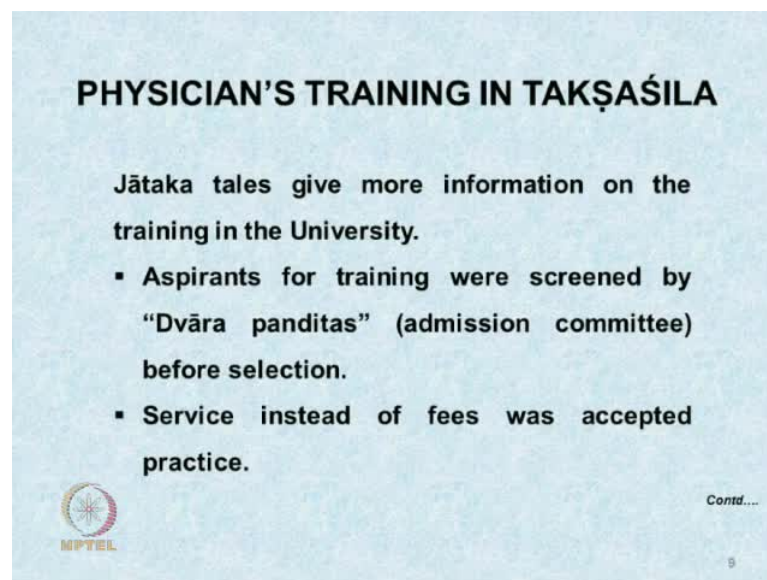


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So, Jivaka replied “I could find no plant which had no medicinal use”. He passed the test, and the teacher certified he could go, and there he came back to Pataliputra. On the way he had very great feat’s of medical achievement, treating a lady with nasya who had incurable headache. He cured her, and he got a lot of fees from that lady, presents; so, he came back loaded with gifts to Pataliputra. He gave all this to his father Abhaya, and he became the royal physician to Bimbisara. He became the physician of the Buddha, and there are number of stories about his great surgical achievements; his doing service free for the poor, charging very high fees from the rich people, and donating most of this to the Buddhist Sangha.

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**PHYSICIAN'S TRAINING IN TAKṢAŚILA**

Jātaka tales give more information on the training in the University.

- Aspirants for training were screened by “Dvāra panditas” (admission committee) before selection.
- Service instead of fees was accepted practice.

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 MPTEL


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Now from the Jataka tales we get other interesting information about the practices in this in Taksasila, and that is the aspirants for training they would come there, they had to face “Dvara panditas” something like an admission committee. They would interview the student and assess his fitness to be selected for training. He had to pass that test to become a student, and service instead of paying fees was accepted.

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### PHYSICIAN'S TRAINING IN TAKṢAŚILA

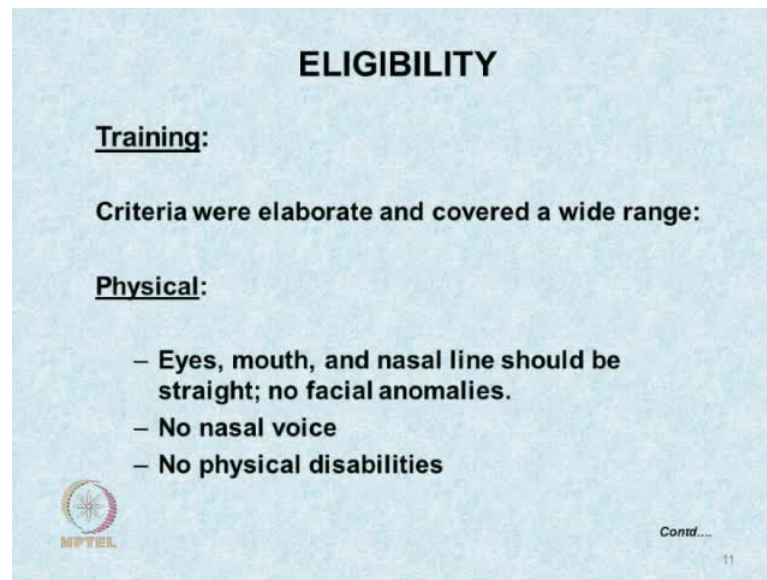
- No caste or other social restrictions on admission.
- Final examination fixed by the preceptor: a śalāka test, when the student had to explain a section of an ancient text where a śalāka had been placed to the satisfaction of a learned assembly.
- A practical test such as what was given to Jīvaka.



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And there were no caste or other social restrictions for admission, and the final examination was fixed by the preceptor or the guru and salaka test that is when a candidate who was fit for this final test, he would come before an assembly of scholars, students, teachers, and there would be a classic text kept there with a salaka or a rod on a particular page. He had to open that, and that particular subject he would have to discuss to the satisfaction of this learner assembly. If he fails that test then obviously he does not make that test. So, this was one of the tests which were prescribed, and a practical test was given specific to a student such as Jivaka had when he was asked to go around the township of Taksasila.

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**ELIGIBILITY**

**Training:**

**Criteria were elaborate and covered a wide range:**

**Physical:**

- Eyes, mouth, and nasal line should be straight; no facial anomalies.
- No nasal voice
- No physical disabilities

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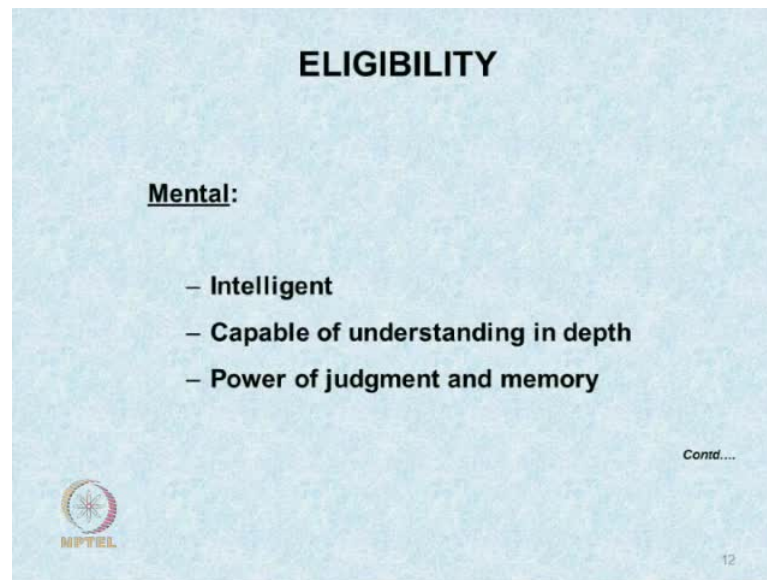
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11

Now the eligibility for training, this is applicable in the Gurukula system also. It is a very elaborate kind of eligibility criteria; physical, these are mostly for the Gurukulas where descriptions which Charaka gives. The unusual thing is in Charaka Samhita which has the longest description of training physicians. There is no reference whatsoever to the university system which obviously existed in his time, but he makes no reference to that at all. So these are the criteria prescribed in the Charaka Samhita which relate to the Gurukula system what existed there. Now the physical criteria, the eyes, mouth and nasal line should be straight. There should be no facial anomalies, no nasal voice, no physical disabilities, these were all insisted.



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**ELIGIBILITY**

**Mental:**

- Intelligent
- Capable of understanding in depth
- Power of judgment and memory

Contd....

 MPTEL

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Mental: He has to be intelligent, capable of understanding in depth, power of judgment and memory.

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**ELIGIBILITY**

**Behavioural:**

- Mild disposition
- Noble by nature
- Preference for solitude
- Freedom from arrogance, speaking ill of others, overattachment to music and dancing
- Hard working
- Possessed of compassion and obedience to teacher.

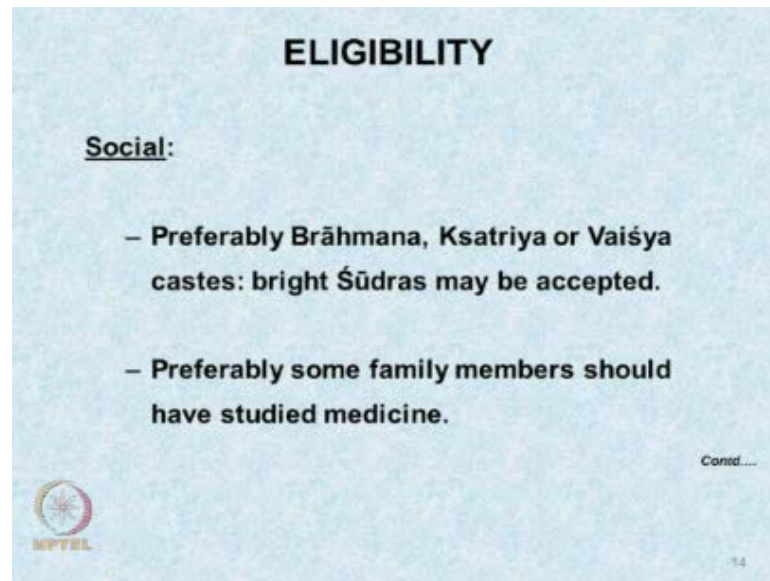
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13

Then behavioral: Mild disposition, not an aggressive nature, noble by nature, preference for solitude, freedom from arrogance, speaking ill of others, over attachment to music and dancing, hard working, possessed of compassion and obedience to the teacher; all these were considered very important in the selection of a candidate.

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**ELIGIBILITY**

**Social:**

- Preferably Brāhmana, Ksatriya or Vaiśya castes: bright Śūdras may be accepted.
- Preferably some family members should have studied medicine.

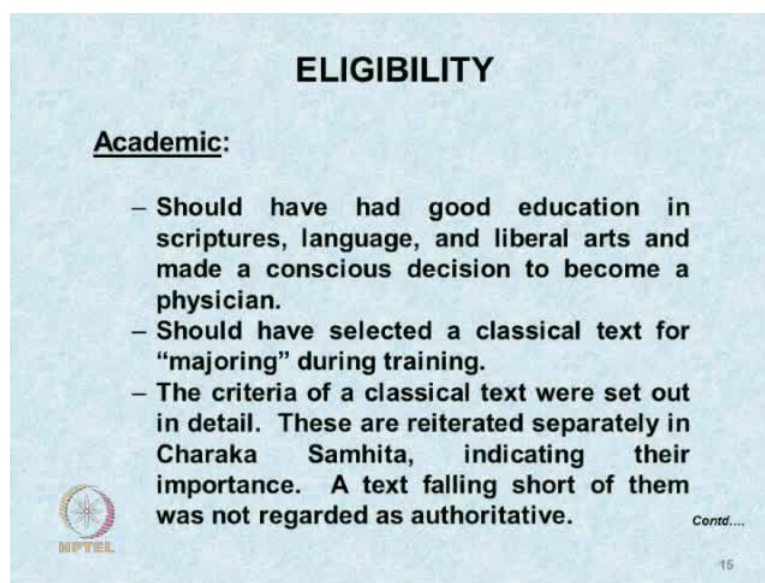
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And there are social criteria preferably Brahmins, Ksatriyas or Vaisyas, bright Sudras may be accepted. This is what Charaka Samhita says, but Sushruta Samhita which we have today was redacted in the 4th century, some 3 centuries after Charaka Samhita was redacted. Now there it becomes much more conservative; there was a regressive phenomenon in our society by the 4th century and Sushruta is much more restrictive. He does not normally permit Sudras being selected for training. If at all grudgingly a bright Sudra is selected, then he says he should be initiated but without the mantras. So, there are restrictions much more severe in Sushruta Samhita and preferably some family members should have had studies done in medicine.

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## ELIGIBILITY

**Academic:**

- Should have had good education in scriptures, language, and liberal arts and made a conscious decision to become a physician.
- Should have selected a classical text for “majoring” during training.
- The criteria of a classical text were set out in detail. These are reiterated separately in Charaka Samhita, indicating their importance. A text falling short of them was not regarded as authoritative.

Contd....

15

Now academic eligibility, he should have had a good general education in scriptures, language and liberal arts and made a conscious decision to become a physician, this is important, so that this test for aptitude. He has made a conscious decision after going through this education humanities that I want to be a physician. Now that is a very important criterion which unfortunately we do not have today that aptitude test with result. Many of them who get into the medical training program, they do not have the aptitude to be a physician with result they have a very unhappy life and they make their patients also unhappy. He should have studied a classical text for majoring during training; this is another very interesting criterion prescribed, that is the student when he comes he not only shows interest in learning medicine but he also says, “This is the text that I would like to specialize.”

Now Charaka gives in a different context what are called is classical text in Ayurveda, they should fulfill 36 criteria. There is a separate discussion on that, so those are the classical texts. Number of books is there, but for a student to select this for majoring that has to fulfill these 36 criteria. That is also important at the time of selection, and the criteria of a classical text which we will not be discussing, but if they are short of this 36 and obviously it is not a classical text that is not suitable as a majoring subject for this student.

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### **QUALIFICATIONS OF A TEACHER**

- **Profound knowledge of medical scriptures.**
- **Intelligence and great practical experience.**
- **Vast knowledge of diseases, health, and their inter-relationship with environment and time.**
- **Generous and charitable disposition.**
- **Familiarity with disciplines other than medicine.**
- **Good skill in communication.**
- **Well disposed to pupils.**



Contd....


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There are also qualifications for a teacher, profound knowledge of medical scriptures, intelligence and great practical experience, vast knowledge of diseases, health and their interrelationship with environment and time, generous and charitable disposition, familiarity with disciplines other than medicine. This is Sushruta also insists on this, so that he should not have a tunnel vision, only medicine; no knowledge of history, no knowledge of society, no knowledge of philosophy. He is a very poor teacher; so he should have familiarity with disciplines other than medicine, good skilled in communication, well disposed to pupils.

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### **QUALIFICATIONS OF A TEACHER**

➤ **Pupils in Gurukulas generally served in the house hold by doing cooking, doing house keeping, collecting fire wood, etc., in lieu of paying fees. This seems to have been permitted even in the Universities i.e.. service in lieu of fees.**

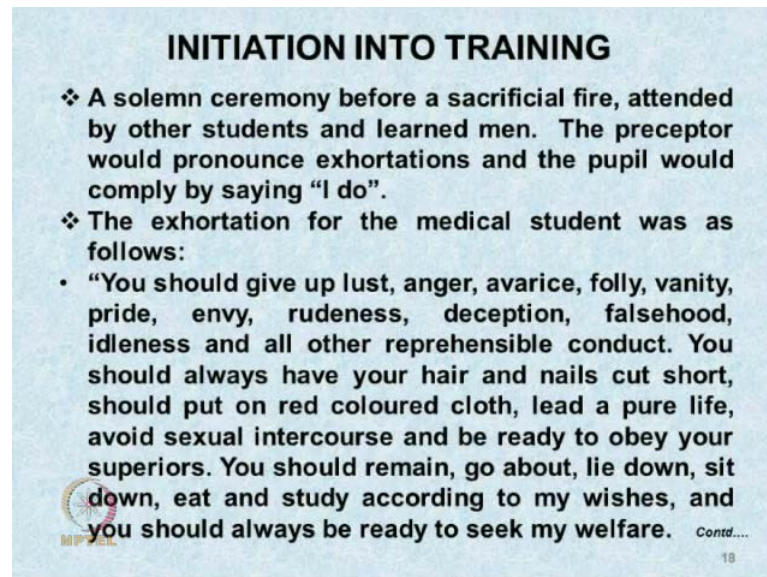


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And pupils in the Gurukulas in the Gurukula system, they lived in the house of the guru. And they did cooking, doing housekeeping, collecting firewood, all these kind of services the students rendered in view of paying fees, and this seems to have been permitted in the universities as well.

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**INITIATION INTO TRAINING**

- ❖ A solemn ceremony before a sacrificial fire, attended by other students and learned men. The preceptor would pronounce exhortations and the pupil would comply by saying “I do”.
- ❖ The exhortation for the medical student was as follows:
  - “You should give up lust, anger, avarice, folly, vanity, pride, envy, rudeness, deception, falsehood, idleness and all other reprehensible conduct. You should always have your hair and nails cut short, should put on red coloured cloth, lead a pure life, avoid sexual intercourse and be ready to obey your superiors. You should remain, go about, lie down, sit down, eat and study according to my wishes, and you should always be ready to seek my welfare. Contd....

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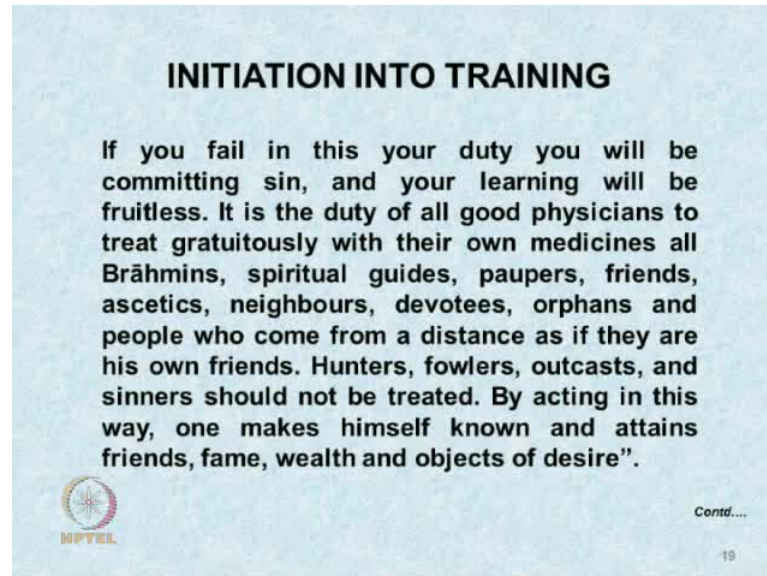
Now this is a long quote, I hesitated whether I should put it here but I decided I would, because this is not only the oath that a student takes at the time of initiation, but really tells you the ideals of a physician or of a physicians life, how he should live, how he should conduct himself, all about medical ethics in India you will find in this quotation. Now, the initiation in the Charakas time was a very solemn affair, it was a ceremony with fire as witness, the guru would be there, and a large number of other physicians senior physicians, students they would all be assembled there. It is a sacred ceremony, and the guru would say these commands, and student had to sit there. He has to say, “I do”, “I do”, in the presence of all these witnesses. So, it was a solemn promise that he was making an oath which influenced him and influenced all others who were listening to him.

So, that is where this becomes important and I will read out with you; “You should give up lust, anger, avarice, folly, vanity, pride, envy, rudeness, deception, falsehood, idleness and all other reprehensible conduct. You should always have your hair and nails cut short, should put on red colored cloth, lead a pure life, avoid sexual intercourse and be




ready to obey your superiors. You should remain, go about, lie down, sit down, eat and study according to my wishes, and you should always be ready to seek my welfare.

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**INITIATION INTO TRAINING**

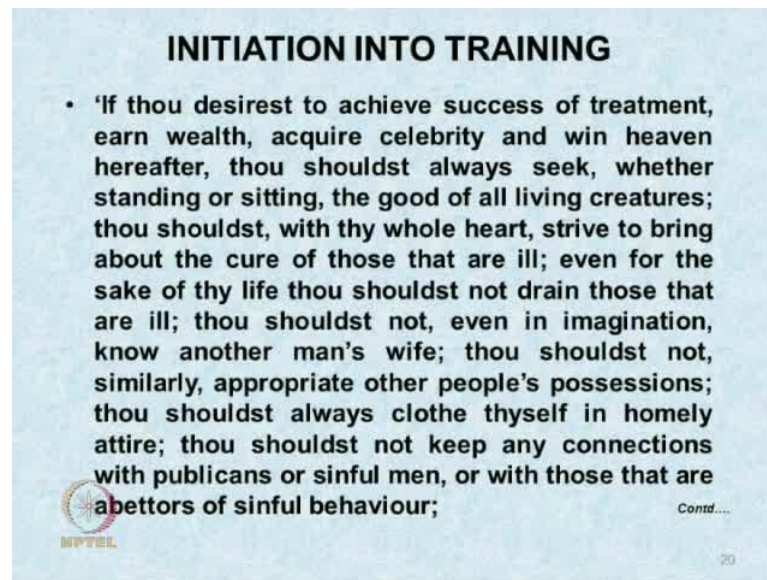
If you fail in this your duty you will be committing sin, and your learning will be fruitless. It is the duty of all good physicians to treat gratuitously with their own medicines all Brāhmins, spiritual guides, paupers, friends, ascetics, neighbours, devotees, orphans and people who come from a distance as if they are his own friends. Hunters, fowlers, outcasts, and sinners should not be treated. By acting in this way, one makes himself known and attains friends, fame, wealth and objects of desire".

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If you fail in this your duty you will be committing a sin, and your learning will be fruitless. It is the duty of all good physicians to treat gratuitously with their own medications, all Brahmins, spiritual guides, paupers, friends, ascetics, neighbors, devotees, orphans and people who come from a distance as if they are his own friends. Hunters, fowlers, outcasts, and sinners should not be treated. By acting in this way, one makes himself known and attains friends, fame, wealth and objects of desire. Does not end there, it goes on.

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**INITIATION INTO TRAINING**

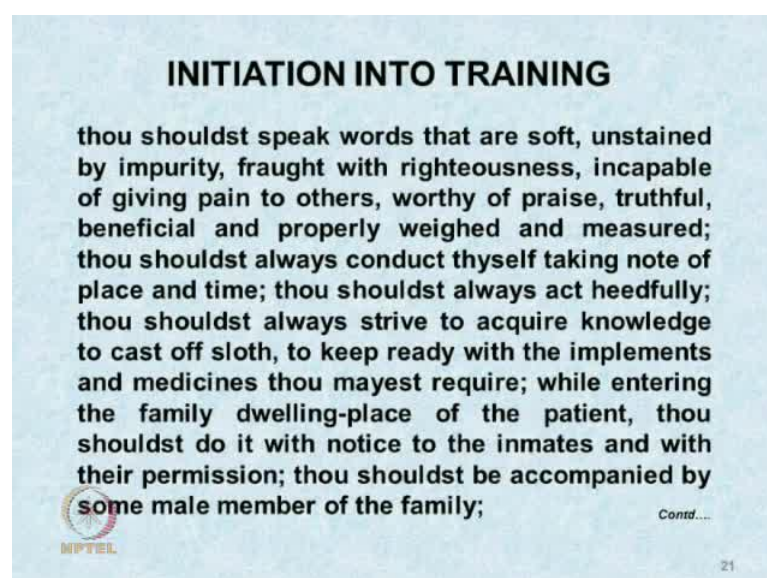
- 'If thou desirest to achieve success of treatment, earn wealth, acquire celebrity and win heaven hereafter, thou shouldst always seek, whether standing or sitting, the good of all living creatures; thou shouldst, with thy whole heart, strive to bring about the cure of those that are ill; even for the sake of thy life thou shouldst not drain those that are ill; thou shouldst not, even in imagination, know another man's wife; thou shouldst not, similarly, appropriate other people's possessions; thou shouldst always clothe thyself in homely attire; thou shouldst not keep any connections with publicans or sinful men, or with those that are abettors of sinful behaviour;

Contd....

MPTEL 20

If thou desirest to achieve success of treatment, earn wealth, acquire celebrity and win heaven hereafter, thou should always seek, whether standing or sitting, the good of all living creatures; thou shouldst, with thy whole heart, strive to bring about the cure of those that are ill; even for the sake of thy life thou should not drain those that are ill; thou should not even in imagination, no another man's wife thou should not, similarly, appropriate other people's possessions; thou should always clothe thyself in homely attire; thou should not keep any connections with publicans or sinful men, or with those that are abettors of sinful behavior;

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**INITIATION INTO TRAINING**

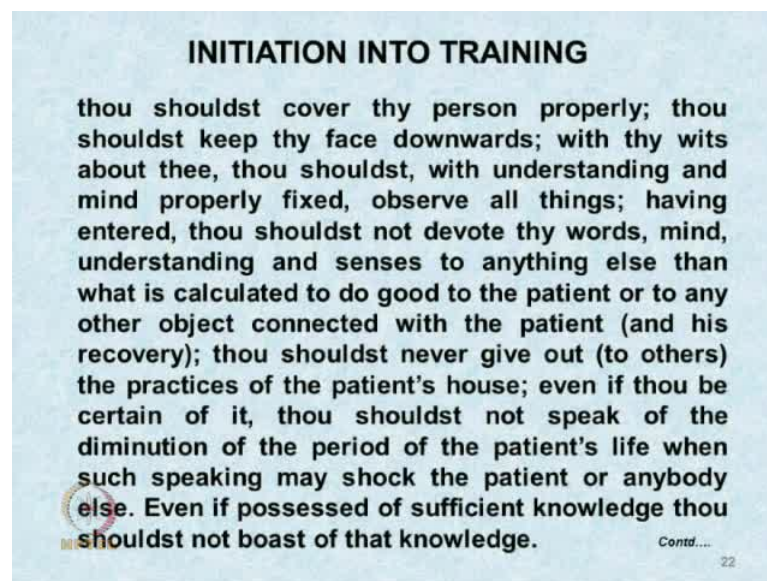
thou shouldst speak words that are soft, unstained by impurity, fraught with righteousness, incapable of giving pain to others, worthy of praise, truthful, beneficial and properly weighed and measured; thou shouldst always conduct thyself taking note of place and time; thou shouldst always act heedfully; thou shouldst always strive to acquire knowledge to cast off sloth, to keep ready with the implements and medicines thou mayest require; while entering the family dwelling-place of the patient, thou shouldst do it with notice to the inmates and with their permission; thou shouldst be accompanied by some male member of the family;

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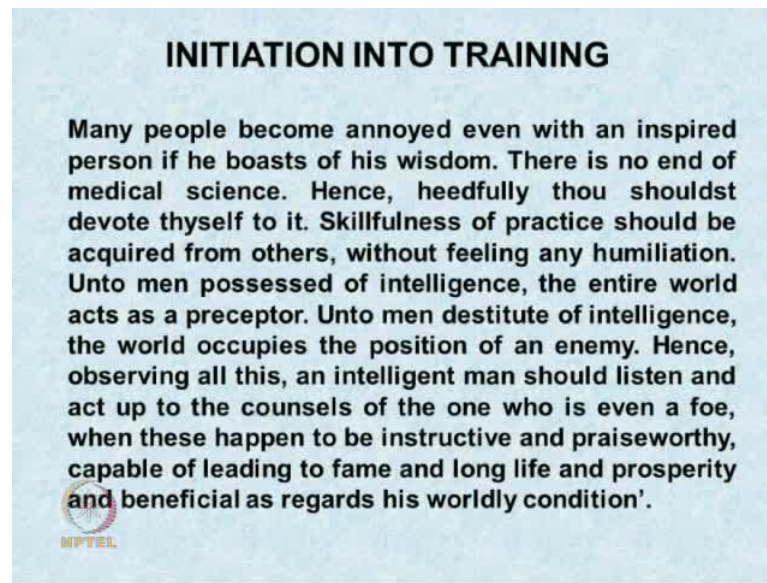
Thou should speak words that are soft, unstained by impurity, fraught with righteousness, incapable of giving pain to others, worthy of praise, truthful, beneficial and properly weighed and measured; thou should always conduct thyself taking note of place and time; thou should always act heedfully; thou should always strive to acquire knowledge to cast off sloth, to keep ready with the implements and medicines thou mayest require; while entering the family dwelling-place of the patient, thou should do it with notice to the inmates and with their permission; thou should be accompanied by some male member of the family;

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thou should cover thy person properly; thou should keep thy face downwards; with thy wits about thee, thou should with the understanding and mind properly fixed, observe all things; having entered, thou should not devote thy words, mind, understanding and senses to anything else than what is calculated to do good to the patient or to any other object connected with the patient or his recovery; thou should never give out to others the practices of the patient's house; even if thou be certain of it, thou should not speak of the diminution of the period of the patient's life when such speaking may shock the patient or anybody else. Lastly, even if possessed of sufficient knowledge thou should not boast of that knowledge.

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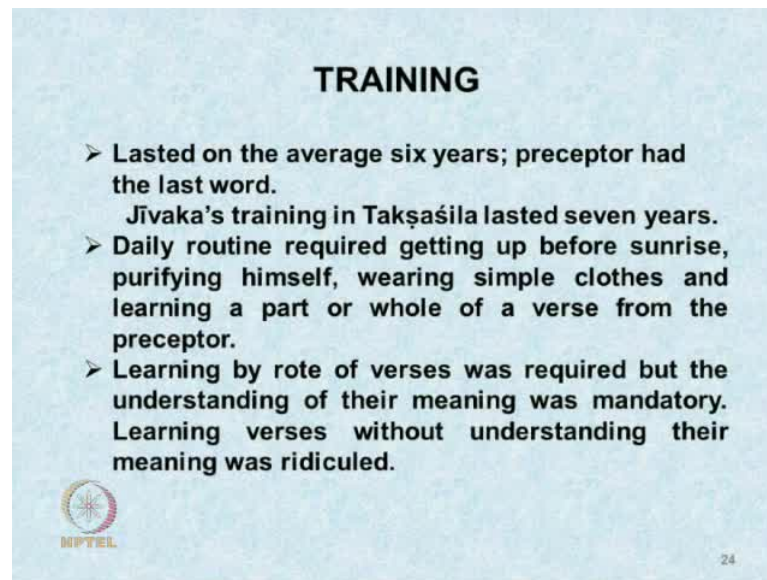


Many people become annoyed even with an inspired person if he boasts of his wisdom. There is no end of medical science. Hence, heedfully thou should devote thyself to it. Skillfulness of practice should be acquired from others, without feeling any humiliation. Unto men possessed of intelligence, the entire world acts as a preceptor. Unto men of destitute of intelligence, the world occupies the position of an enemy. Hence, observing all this, an intelligent man should listen and act up to the counsels of the one who is even a foe, when these happen to be instructive and praiseworthy, capable of leading to fame and long life and prosperity and beneficial as regards his worldly condition.”

Now this is very exhaustive the oath that the student is taking. It covers all aspects of his life or which will be vital for his throughout his professional carrier, something much more than the oath that we take now.



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## TRAINING

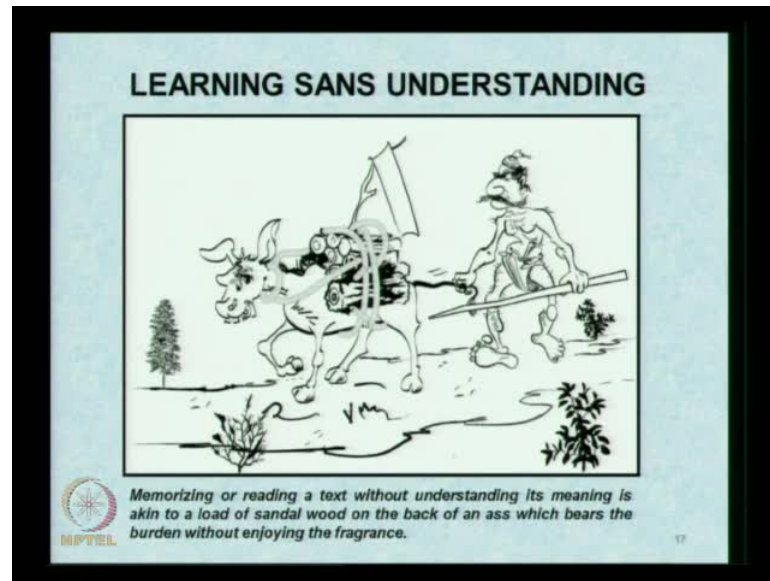
- Lasted on the average six years; preceptor had the last word.  
Jivaka's training in Takṣaśīla lasted seven years.
- Daily routine required getting up before sunrise, purifying himself, wearing simple clothes and learning a part or whole of a verse from the preceptor.
- Learning by rote of verses was required but the understanding of their meaning was mandatory. Learning verses without understanding their meaning was ridiculed.

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Now once this oath is taken he is initiated into training. The training begins and it has on the average it lasted 6 years, Jivaka's lasted 7 years and that is flexible because it is determined by the preceptor. And the daily routine required getting up before sunrise, purifying himself, wearing simple cloths and learning a part or a whole of a verse from the preceptor. It is mentioned there that a preceptor in this teaching of verses from the ancient text, he may decide to teach one line or he may decide to teach two lines or it may be one whole verse depending on how much the students were capable of understanding. And learning by rote this was very much insisted on Ashtanga Hridaya even in recent times in the 20th century, they had to learn by heart, the whole Ashtanga Hridaya. That was required, but understanding of their meaning was mandatory; it was not just learning by heart.



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In fact a cartoon here, this is what Sushruta talks about a donkey carrying sandal wood on its back. Now the donkey is bearing the burden, but it does not enjoy the fragrance of the sandalwood. So, a student who is learning by rote without understanding the meaning was likened to a donkey which you see in this cartoon.

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**THEORETICAL TRAINING**

- ✓ Principal method was discussions as exemplified in Charaka Samhita. Discourses also employed.
- ✓ During discussions, the participants would sometimes disagree, but reach a consensus during the Chairman's summing up.
- ✓ Pupils learned from informal discussions as they shared life in the Gurukula.

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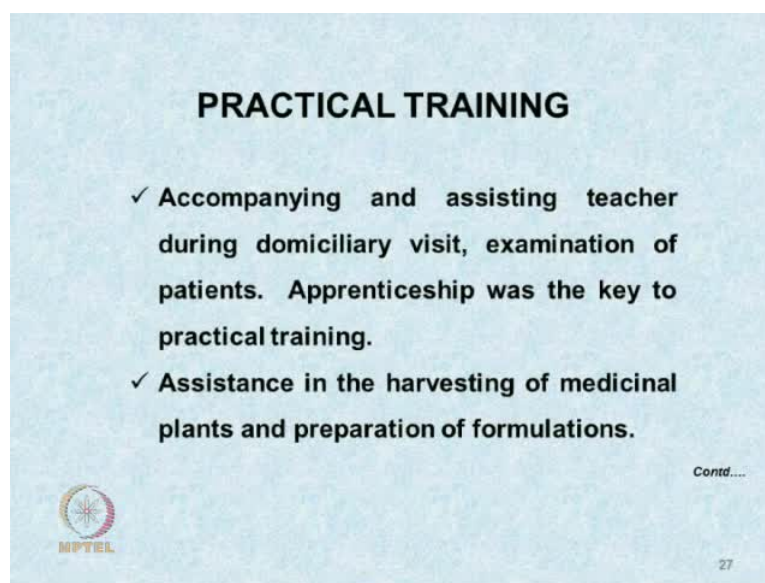
Now the principle method of a theoretical training was by discussions or Sambhasha as Charaka talks about. There are also discourses by the guru, because there are many chapters they look like discourses of the guru. But many of them are Sambhashas

discussions with Guru in the chair and the disciples sitting around and discussing a particular topic. So, that was recommended as the best form of a theoretical training. And the pupils learned from informal discussions among themselves, because they are sharing the same place where they were staying together.

And there is an ancient Sanskrit verse about training, acharya paadham atha they, sishya paadham sume dhaya, paadham sub bharmacharya ksho, paadham kaalak krumayanatho. What it says is a quart, paadham is a quarter, a quarter the student learns from the teacher from the guru, another quarter he learns by his own effort, sume dhaya. And the third quarter is what you see here that he is learning from the informal discussions when they stay together like they stay in a hostel nowadays. Lots of informal discussions among classmates and that is where they learn, clarify many points, they understand much better; that is also part of learning and the last quarter is time is the teacher

Time is not only a healer, it is also a teacher. It is something which is not easily measurable like managing a particular patient, managing a crisis; if you have done that the first time you are doing it and after several such experiences in treating, managing a crisis, your whole approach to that management changes. It is not easily measurable, but it is time which is doing that teaching, nothing else can do that, a teacher cannot do it. You cannot simply sit at night and work hard and gain that; no, it is not possible. It is time which teaches and that is kaalak krumayanatho. So, here you find the students learning through informal discussions in the Gurukula over a period of 6 years.

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## PRACTICAL TRAINING

- ✓ Accompanying and assisting teacher during domiciliary visit, examination of patients. Apprenticeship was the key to practical training.
- ✓ Assistance in the harvesting of medicinal plants and preparation of formulations.

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Practical training in physician's life that was accompanying and assisting the teacher in all that he was doing; you saw in that oath, you shall always do what I ask you to do, you should accompany me wherever I go. So, they were always with the teacher, and the teacher was a messenger was coming with message about a patient's illness, guru would be listening to him and the students are there. If he decides to go and visit that patients home a domiciliary visit, invariably the student's one or two of them would accompany him, that was a very important training for them, how does he go? How does he talk to the patient? How does he talk to the relatives? What are the things that he observes? How does he make a decision about a particular type of treatment?

All these were invaluable experience in training. And medicinal plants collection, very important part of training, again the teacher would often go and give the directions about how to identify a particular plant? How to harvest it? All these were taught that is also part of training, so that they were fully trained in the understanding of medicinal plants by the time they finished their training.

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## PRACTICAL TRAINING


- ✓ Maintaining highest standards of professional and ethical conduct in the practice of medicine.
- ✓ Futility of theoretical or practical training in isolation was keenly noted as Suśruta called those with training in one branch alone “one winged birds”.




Contd....  
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And the ethical conduct practice of medicine which also during these years they acquire and the futility of theoretical or practical training in isolation; that is if you have only theoretical training or only practical training that is completely unacceptable. And Sushruta says it is like a “one winged birds”, you need both; so, it is not enough that you know all the theory, but you are no good in identifying medicinal plants or making medicinal formulations, you have no practical skills in doing these, then you are not a good physician. So, both these should be considered equally important in training.

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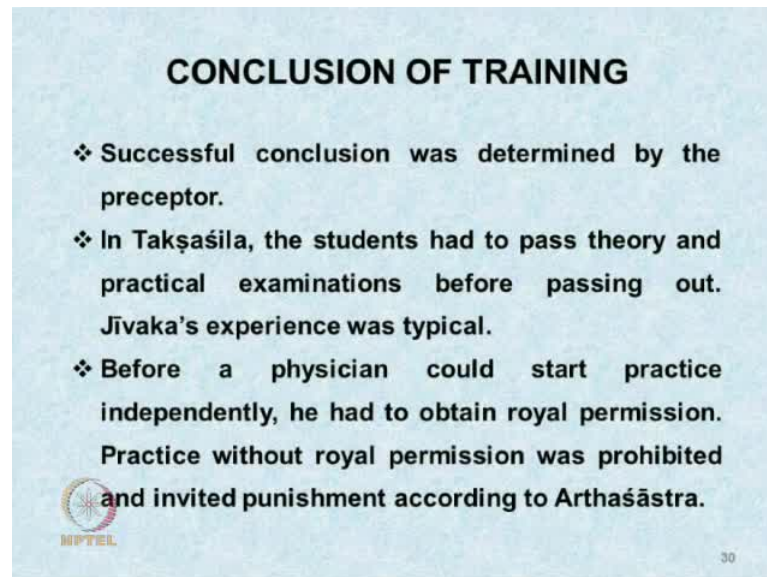
*Learning to be a physician; note the medical quartet*



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Here is a picture, the guru or a senior physician is attending on a patient, and he has that Brahmachari the student next to him, and medications are kept there. This is the Padachatustayam, the three components of medical treatment, the patient, the physician, the assistant and medications, you see all these here.

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**CONCLUSION OF TRAINING**

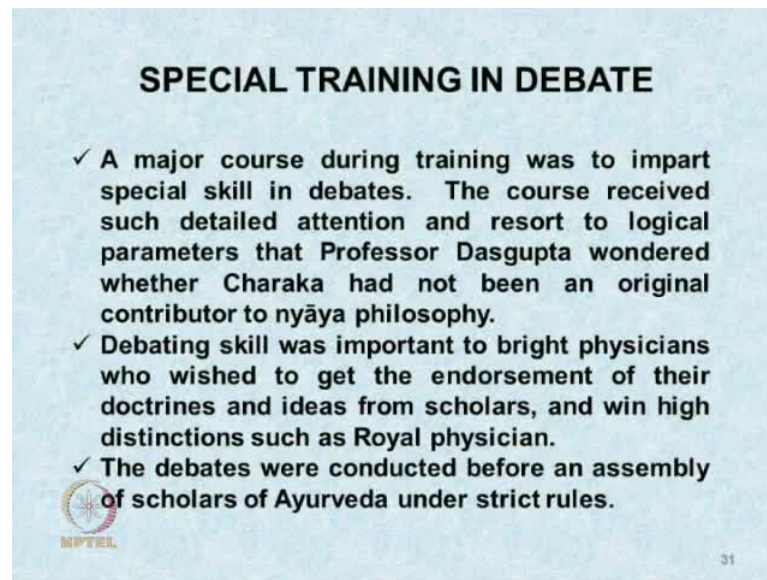
- ❖ Successful conclusion was determined by the preceptor.
- ❖ In Takṣaśīla, the students had to pass theory and practical examinations before passing out. Jīvaka's experience was typical.
- ❖ Before a physician could start practice independently, he had to obtain royal permission. Practice without royal permission was prohibited and invited punishment according to Arthaśāstra.

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Now the conclusion of training, when do you determine that the training is complete? It is not the same for everybody, some cases it may be six, may be seven, so that it is determined essentially by the preceptor when the training is complete. In Taksasila the students had to pass theory and practical examinations. That was more structured in a university it should be, and Jivaka's experience we have discussed already, whereas in a Gurukula the physician decides the guru decides whether this particular students training is complete, then he is given a certification and on the basis of which he has to get a royal permission or from the kings officer before he could start independent practice. In fact Arthasastra of Kautilya, if somebody starts a practice without this royal permission, he could be punished, severe punishment, that is also mentioned.




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**SPECIAL TRAINING IN DEBATE**

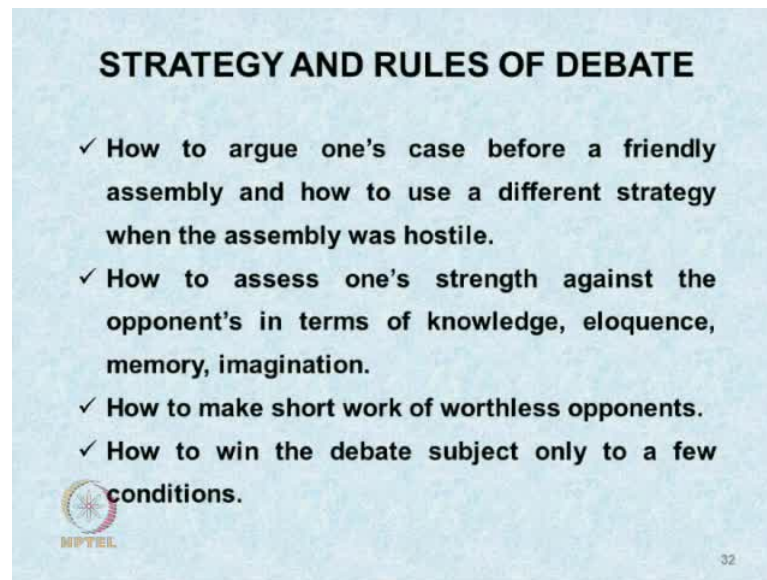
- ✓ A major course during training was to impart special skill in debates. The course received such detailed attention and resort to logical parameters that Professor Dasgupta wondered whether Charaka had not been an original contributor to nyāya philosophy.
- ✓ Debating skill was important to bright physicians who wished to get the endorsement of their doctrines and ideas from scholars, and win high distinctions such as Royal physician.
- ✓ The debates were conducted before an assembly of scholars of Ayurveda under strict rules.

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Now is that all the training? Charaka Samhita in fact talks a great deal about training in debate. This is the basic training which the physician has obtained to practice medicine, but everybody is not just interested in stopping at that, they want to do better. There may be physicians who have a new idea, a new doctrine, and they want to get it accepted by the wider, the world of scholarship, and how does he do that? He has to present this before a learned assembly, he had to argue on its basis and get it accepted, faces a lot of argumentation. So, the debating skill that is how the whole chapter devoted to debate. In fact, it is so detailed about the logical parameters of debate and so on.

Professor Dasgupta in his history of Indian philosophy, he says that the extent of detail which Charaka talks about this debate, most likely Gautama Nyaya sutras which is the basis of Nyaya philosophy. That owes his inspiration to Charaka, because Nyaya sutras were written later than the first century. So, there is a great deal of originality in the way he talks about this debate. And the debating skill was important mainly for this; that is if you want to establish your doctrine, you have an idea not everybody has it, then you need this skill not otherwise. If you simply want to be a family physician there is no need for this but for those brilliant physicians they need this or if you want to be a royal physician, a great mark of recognition, then again you would need this. And this was again conducted in an assembly, open assembly, of ayurvedic scholars with strict rules which is what that chapter is all about.

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**STRATEGY AND RULES OF DEBATE**

- ✓ How to argue one's case before a friendly assembly and how to use a different strategy when the assembly was hostile.
- ✓ How to assess one's strength against the opponent's in terms of knowledge, eloquence, memory, imagination.
- ✓ How to make short work of worthless opponents.
- ✓ How to win the debate subject only to a few conditions.

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Now he goes into just a brief summary of that, how to argue one's case before a friendly assembly. There may be an assembly, may be your own university or your own town where people are known to you and everybody is friendly, you may be presenting your case before that assembly or you may be presenting your case in a hostile assembly, may be in a different place, they are not well disposed to your own school or your own ideas. Now there the atmosphere is very different.

So, the very detailed descriptions are given how you should assess that assembly, how should you assess your strength, your knowledge, your debating skills against those of your opponent, what are the weaknesses of the opponent? All these you must carefully analyze, your ability to speak, your ability to debate, all these things to be carefully studied before you start on this. And if you find out in advance that your opponent is not a really scholarly person, how do you cut short that his presentation itself, how to intimidate him? Even these are mentioned, but then there are conditions attached to these.

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**BOTTOM-LINE FOR THE DEBATER**

- ✓ **Subject for debate should be confined to Ayurveda.**
- ✓ **Not a word should be spoken which is not well thought out, which is out of place or which is lacking in scriptural authority.**
- ✓ **Whatever is said should be backed by reason because debates based on reason “are free from ill-feeling and they advance the objectives of medicine by sharpening the intellect”.**



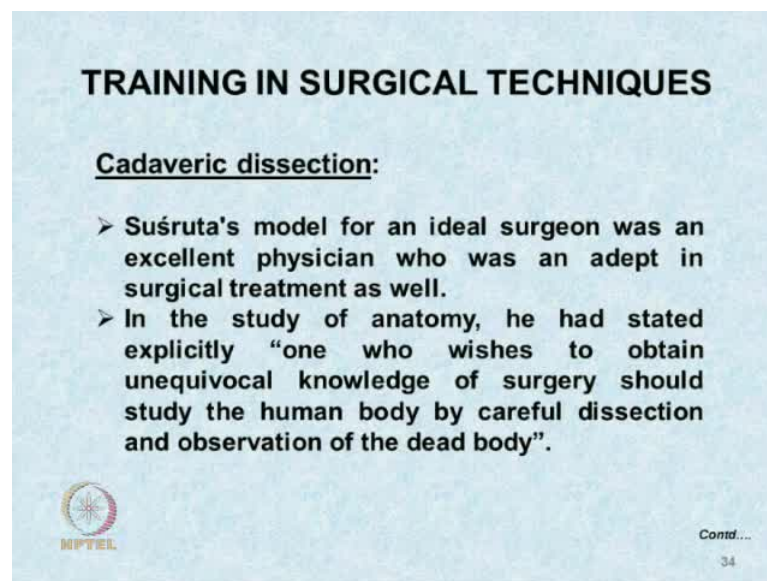
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Now when you sometimes when you read the detailed description how to deal with an opponent, you may even get the feeling where some of these methods are not very fair. When you feel like that, then you come the bottom-line for a debate, Charaka says subject for a debate should be confined to ayurveda. Not a word should be spoken which is not well thought out, which is out of place or which is lacking in scriptural authority. Whatever is said should be backed by reason because debates based on reason “are free from ill-feeling and they advance the objectives of medicine by sharpening the intellect.” Now that redeems the whole description. It is really the bottom-line of that chapter.

So, that gives you, in fact this whole tradition of presenting a case, arguing. It is a long tradition in India. There are three types of debate in India; one is Jalpa, Jalpa is you keep on attacking your opponent, may be even vilify him and then you present your case, that is Jalpa. The second is Vitanda; that you keep on attacking your opponent or your adversary, even vilify him, but do not say what your case is, you do not mention it at all, that is Vitanda. And the third is the only acceptable based on reason which Charaka talks about, that is Vada. So, Vada is the only kind of debate which is acceptable which is based on reason, there are very strict parameters how to present your case, not so much about vilifying and opposing, attacking, your adversary. So these are the three types in the Indian tradition.

So, Charaka what he talks about is essentially the debate should be Vada, not on Jalpa or Vitanda. Even nowadays you can see this. Many of the debates going on, person who talks very eloquently on the TV you will see this. Many of them are Vitanda, he is only attacking the other person, but he does not really present any alternative how to solve this particular problem that will be singularly absent. So you can see it even today, but this was recognized even in those days.


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**TRAINING IN SURGICAL TECHNIQUES**

**Cadaveric dissection:**

- Suśruta's model for an ideal surgeon was an excellent physician who was an adept in surgical treatment as well.
- In the study of anatomy, he had stated explicitly "one who wishes to obtain unequivocal knowledge of surgery should study the human body by careful dissection and observation of the dead body".

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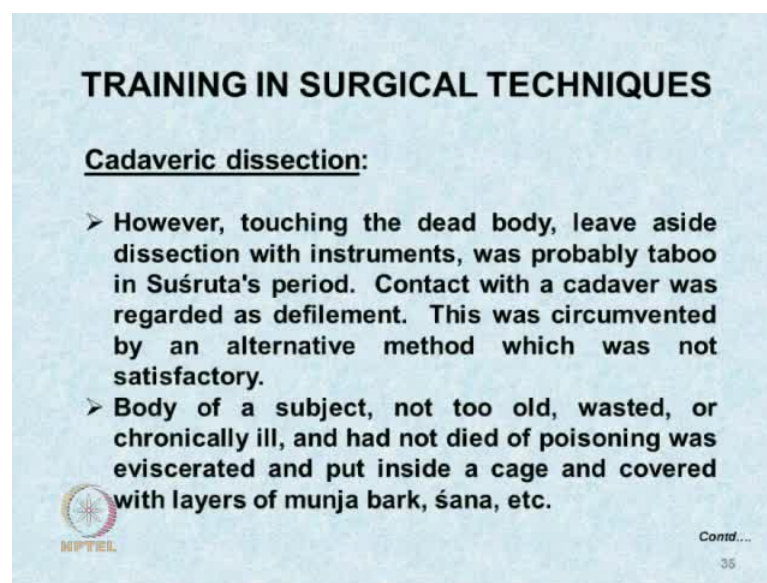
Now training in surgical techniques, again once the basic training of a physician is over, then only the Dhanvantari tradition starts because the insistence of Sushruta, to be a good surgeon, you have got to be a good physician first. Yesterday we talked about this, if you want to treat a surgical condition which has got dosha perturbation involved, you should be able to treat that dosha perturbation and then surgery or dosha perturbation may have to be treated following surgery. So, surgery becomes an incident in the management of a dosha perturbation. Now if that kind of care has to be given, obviously the surgeon has to have profound understanding of medicine. So, it is very clear from the context, that only a physician who has had the basic training could get into surgical training.

Not everybody needs to do this, only those who wish to follow the Dhanvantari tradition would need to undergo this. Now the very first thing in the surgical training, Sushruta talks about, the ideal surgeon is an excellent physician and the study of anatomy, he emphasized it so much, one who wishes to obtain unequivocal knowledge of surgery

should study the human body by careful dissection and observation of the dead body. This is a statement which is a quote from Sushruta Samhita, but unfortunately the times in which he lived or when the book was written anyway or redacted, touching the dead body leave aside dissection with instruments; this was taboo in Sushrutas period.

Now contact with a Cadaver, was regarded as defilement. This was circumvented by an alternative method which was not very satisfactory. There is a great pity in our old surgical tradition.


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**TRAINING IN SURGICAL TECHNIQUES**

**Cadaveric dissection:**

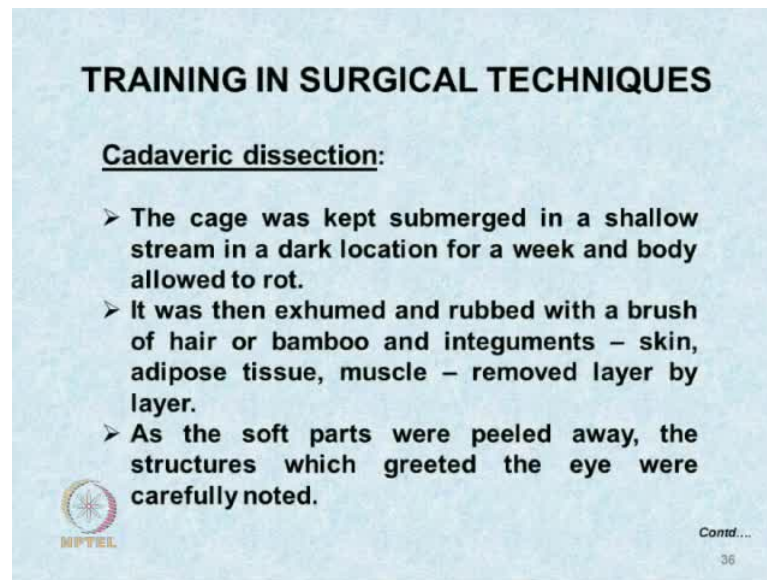
- However, touching the dead body, leave aside dissection with instruments, was probably taboo in Suśruta's period. Contact with a cadaver was regarded as defilement. This was circumvented by an alternative method which was not satisfactory.
- Body of a subject, not too old, wasted, or chronically ill, and had not died of poisoning was eviscerated and put inside a cage and covered with layers of munja bark, śana, etc.

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Now what was the method avoiding or circumventing this cutting the dead body? That was the body of a subject, not too old, wasted or chronically ill, had not died of poisoning; it was eviscerated and put inside a cage and covered with layers of munja grass.




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**TRAINING IN SURGICAL TECHNIQUES**

**Cadaveric dissection:**

- The cage was kept submerged in a shallow stream in a dark location for a week and body allowed to rot.
- It was then exhumed and rubbed with a brush of hair or bamboo and integuments – skin, adipose tissue, muscle – removed layer by layer.
- As the soft parts were peeled away, the structures which greeted the eye were carefully noted.

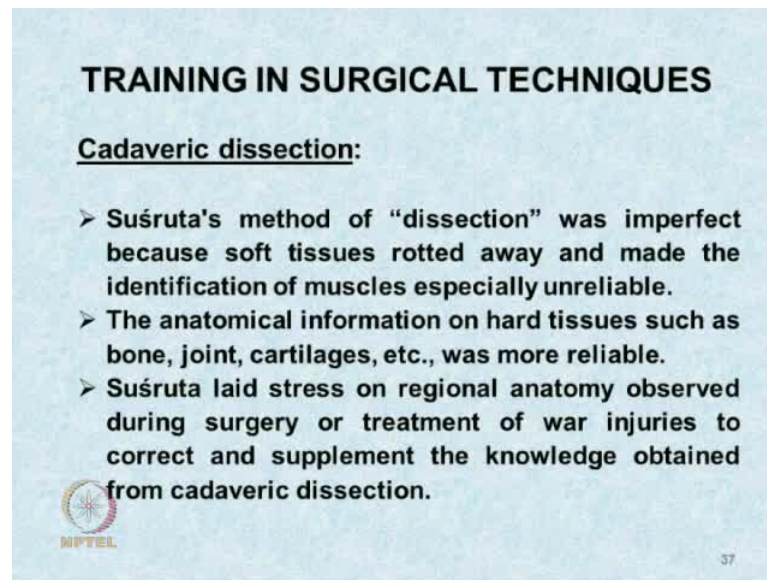
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Now this cage was kept submerged in a shallow stream in dark place so that not too many people would see it. It would not attract any attention. For a week or so, by that time the body would have rotted completely, and then it was exhumed and rubbed with brush of hair or sharp edges of leaves layer by layer. That is how dissection was done, to avoid this, the taboo of cutting the dead body. Now when you do this, you will find new layers exposing the skin is scraped off, then you have some subcutaneous tissue, you scrape it off, because it is rotted, you can scrape it off.

Then you find the adipose tissue, like that muscle and slowly you come to the bone the skeleton. So, this was the method which was practiced a very tedious and highly unsatisfactory way of doing dissection and the soft parts peeled away, you see the bone, cartilage and so on. And obviously in the earlier lectures we have seen looking at the anatomy, the description of the number of bones, number of muscles for example, these are all closely inaccurate because you cannot get correct information.


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**TRAINING IN SURGICAL TECHNIQUES**

**Cadaveric dissection:**

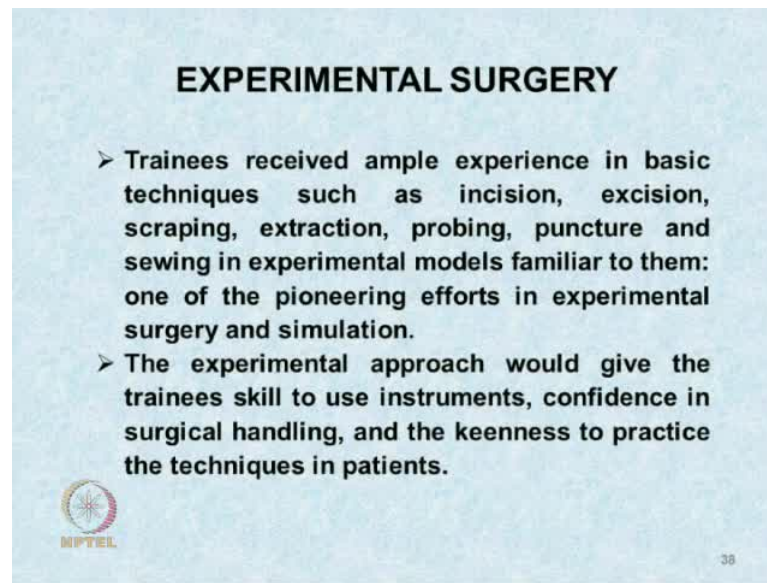
- Suśruta's method of "dissection" was imperfect because soft tissues rotted away and made the identification of muscles especially unreliable.
- The anatomical information on hard tissues such as bone, joint, cartilages, etc., was more reliable.
- Suśruta laid stress on regional anatomy observed during surgery or treatment of war injuries to correct and supplement the knowledge obtained from cadaveric dissection.

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Now the deficiency of this approach was probably known to them, and there was some fair idea about the skeleton, even then there are mistakes but that could be because of definitions. For example, teeth all the hard tissues, cartilages they were all considered as bone or protuberance in a particular bone, like the femur, there is a trochanter which is not a separate bone, but it is considered as a separate bone. That could be a definition problem, but even otherwise the accuracy was lacking even in the skeletal anatomy. But soft tissues totally unreliable and the only ways you could supplement this information for a surgeon, for example, operating on the axilla or the leg or anywhere or dealing with a wound which we have discussed earlier, you have to have very good knowledge of anatomy, presence of blood vessels.


This they gained it by the regional anatomy during operations or a person coming with a wound. Yesterday we talked about the cuts, the ear being cut off or the leg being cut; that kinds of accidents major accidents, you see the blood vessel, you see the nerve, you see the tendon; all these were very carefully observed. So, the regional anatomy seen observed during treatment of a wound or during an operation, these were very priced information, and they were used to supplement the inadequate knowledge they gained by dissection.

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**EXPERIMENTAL SURGERY**

- Trainees received ample experience in basic techniques such as incision, excision, scraping, extraction, probing, puncture and sewing in experimental models familiar to them: one of the pioneering efforts in experimental surgery and simulation.
- The experimental approach would give the trainees skill to use instruments, confidence in surgical handling, and the keenness to practice the techniques in patients.

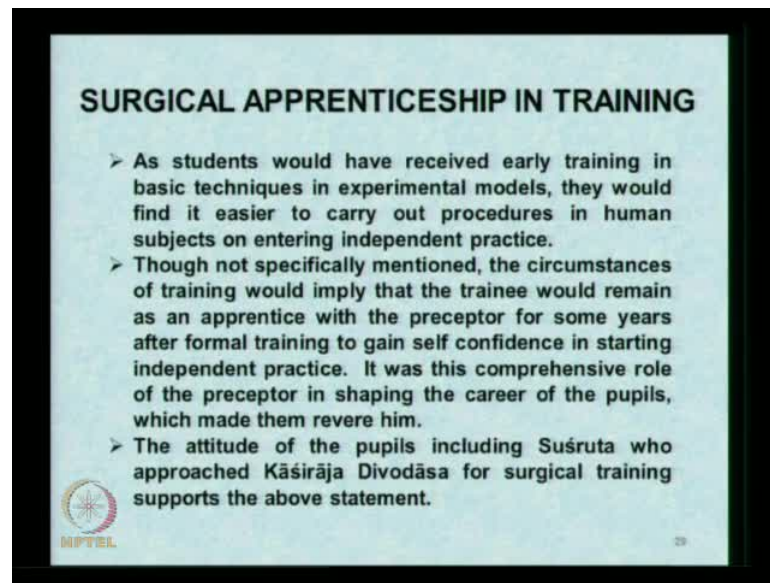
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Now experimental surgery, this is the learning anatomy in the course of surgical training, and then the learning the basic techniques of surgery, we have already seen the basic techniques like incision, excision, scraping, extraction, probing, puncture, sewing, all these things you have seen the models which were used on ordinary common leather bag or a fruit and so on. They were used as experimental models to train these young surgeons in use of surgical techniques, how to handle a knife, how to do excision, how to do scraping. All these were taught many times, so that they were familiar with the use of knife, various other instruments and a good hand a surgical hand that they develop during the training.


And these were extremely useful, so by the time they came to a stage when they had to assist the guru in a particular procedure, he was already experienced in handling that instrument or giving a hand to the teacher in doing something. Suppose they had two incisions to make, he might even ask the student to make another incision if you are sufficiently trained. So, that is how the apprenticeship he was trained and the experimental training, that was very crucial, because you could not do this for the first time in a patient. So, I think the Sushrutas was probably one of the earliest to introduce models in surgical training.

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**SURGICAL APPRENTICESHIP IN TRAINING**

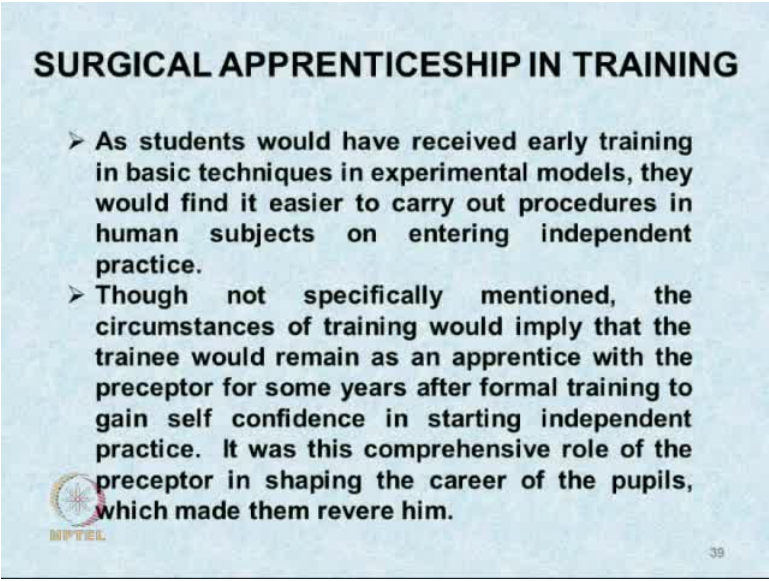
- As students would have received early training in basic techniques in experimental models, they would find it easier to carry out procedures in human subjects on entering independent practice.
- Though not specifically mentioned, the circumstances of training would imply that the trainee would remain as an apprentice with the preceptor for some years after formal training to gain self confidence in starting independent practice. It was this comprehensive role of the preceptor in shaping the career of the pupils, which made them revere him.
- The attitude of the pupils including Suśruta who approached Kāśirāja Divodāsa for surgical training supports the above statement.

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Now as the student would have trained in the early training, there are not too many other texts talking about; only Sushruta Samhita have any reference to surgical training. It is not specifically mentioned after this training of the apprenticeship, something about further training, there is no clear mention of that but it is obvious simply gone through this experimental phase of training, and he is certified he gets a royal permission but obviously he would not be ready to do independent practice. To do surgical operations on his own, that he would not have the confidence and the patients would not have confidence in him. So therefore, what is not clearly stated in the Sushruta Samhita is a further period of training when he serves with the teacher as an apprentice for a certain period of time. That is not clearly mentioned here, but obviously it must have been there; otherwise, it is not imaginable, that after you have certified straight away you go and start independent practice.

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**SURGICAL APPRENTICESHIP IN TRAINING**

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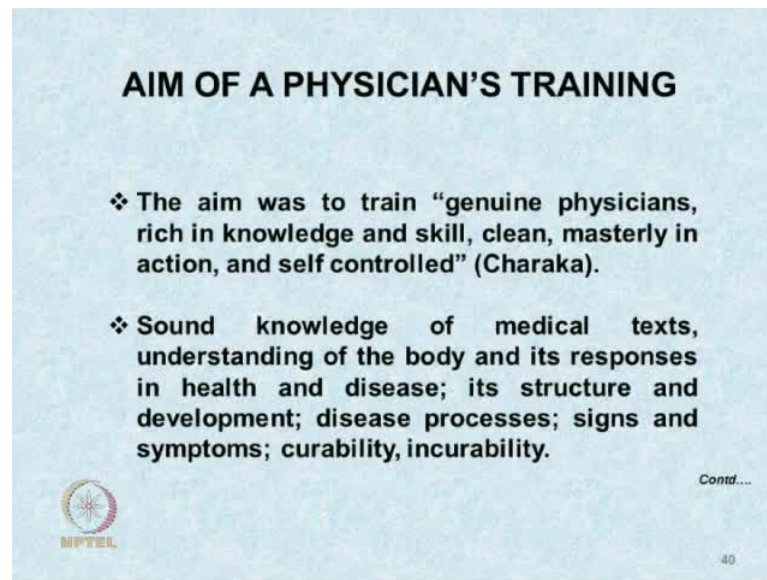
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That is where to get a royal permission to start independent practice, that is mentioned, that is probably only after this further period of training under a preceptor, he would be considered eligible to get the royal permission for independent practice. And this is also the reason why the pupil or the student he considered the guru with a great deal of reverence, because he was not just learning theory and practice from this guru. He was practically giving shape to his whole carrier. So, there is a great deal of gratitude, reverence, all combined for this guru who has given him literally a new birth.

This attitude in the beginning itself, when the students including Sushruta, they go to Divodasa to learn, I like to think that they were already trained in medicine, they were going for a special training and they go to Kashi Raja Divodasa, the great Dhanvantari tradition, an incarnation of Dhanvantari according to some schools. When they go to him and say we have to come to learn surgery, and he accepts them. Now that looks like their attitude to Divodasa is like a person who is worshipping. Now that kind of attitude comes because he is literally giving him a new life into a new profession as a surgeon, that attitude is very important.



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**AIM OF A PHYSICIAN'S TRAINING**

- ❖ The aim was to train “genuine physicians, rich in knowledge and skill, clean, masterly in action, and self controlled” (Charaka).
- ❖ Sound knowledge of medical texts, understanding of the body and its responses in health and disease; its structure and development; disease processes; signs and symptoms; curability, incurability.

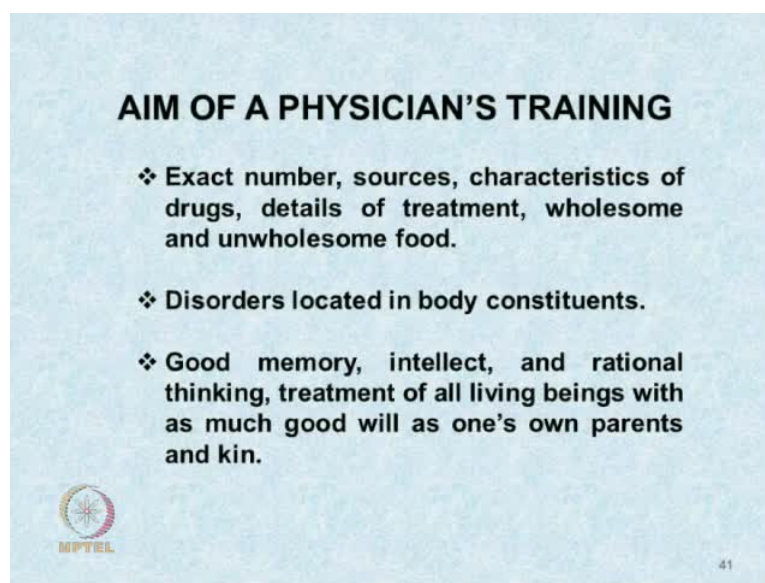
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Now the aim of a physician's training, the aim is to train genuine physicians, rich in knowledge and skill, this is Charakas, clean masterly in action and self controlled. These are all requirements of a good physician, and he goes on sound knowledge of medical text, understanding of the body, and its response in health and disease Sastha Virutha and Aathara Virutha, that is what he is talking about the structure and development of the body, disease process, we had a long discussion on this; that is from the time, cause comes in then there is a long process before it become manifest as a full disease, what happens in the body during that time. It is only Charaka who discusses this disease process. We had a long discussion on this how this process is involved; something is incubating in the body during this time, what are those processes? A physician should have understanding of this signs and symptoms, assessing curability and incurability, these are all essential for a physician's education.

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The exact number, sources, characteristics of drugs, that is the whole medicinal plants literature, identifying them, details of treatment, wholesome and unwholesome food, dietetics, another important area, disorders located in body constituents; there are seven body constituents, disorders, characteristic of each of these, good memory, intellect and rational thinking, treatment of all living beings with as much good will as one's own parents and kin.

These are the ideal characteristics of a physician according to Charaka. Now it is interesting that the training of a physician which is discussed in very great detail in Charaka, it is discussed with much less detail in Sushruta and hardly at all in Vagbhata. Vagbhata is meant for a practicing physician, he did not pay too much attention, but, there are enough in Vagbhata Samhita also that you know how this tradition of Guru-Shishya Parampara that was revered. That is the university system perished long ago, Guru-Shishya Parampara that tradition continued in India even after the twentieth century, but then the problem practical problem, P. S, Varier of Kottakkal more than 100 years ago who founded the Arya Vaidya Sala, he went through the Guru-Shishya tradition.

He himself writes and the life was so difficult by end of nineteenth century. Teacher is living in a faraway place, traveling to that place, coming back; all these difficulties became so great for Guru-Shishya type of training. He realized that this will only remain

very very limited number of people demanding Ayurvedic treatment is so great. This is so limited with so many practical problems; he knew that there has to be a different system of training. That this is also something we should; Ayurveda did not stop with Guru-Shishya. Towards the end of the nineteenth century and early twentieth century, there was a significant change in the approach to the training of physicians in Ayurveda.

And the best example that I am aware of is P. S. Varier's who has written on this subject a very traditional Ayurvedic physician, immensely proud of ayurveda, and a path setter in many ways. And one of the things he did was this; there must be a school for training. In other words larger number of students, large means not hundreds but certainly more than five or six, and there should be more than one teacher, so there a school to be started. This is what he did in Kottakkal many many years ago, then institutional training something like not as big as university of Taksasila.

So, we have once again coming back to that, today of course we have Ayurvedic colleges all over, Ayurvedic universities are there. So, we find it is interesting; we started with a great university system in India. They were not set up by governments incidentally. All these universities of Nalanda, Taksasila and so on, they were not set up by the government. They were set up essentially by public contribution by traders giving money, public contributing, public contributing some villages, the revenue from that would support this university like Nalanda. So, king might give but essentially they were not government institutions; there was no control by the king on anything that university was doing.

That was the tradition from Buddha's time, then universities were destroyed, that was the phase we went through, then the Gurukula system that is what kept it going through all the foreign invasions. Every institution was destroyed. These Gurukulas could not be destroyed, they were spread all over small small places, they kept it alive, and now we are again towards the end of the 19th century, 20th century, we once again see the shift towards universities coming up again. Large institutions, large number of teachers, large number of students, so necessarily the teaching techniques would change, approach would change, so we have once again the cycle is coming back to the university system. There are hardly any Gurukula systems I know there is some but very few, so that are an interesting cyclical change that ayurvedic education is facing in India today.