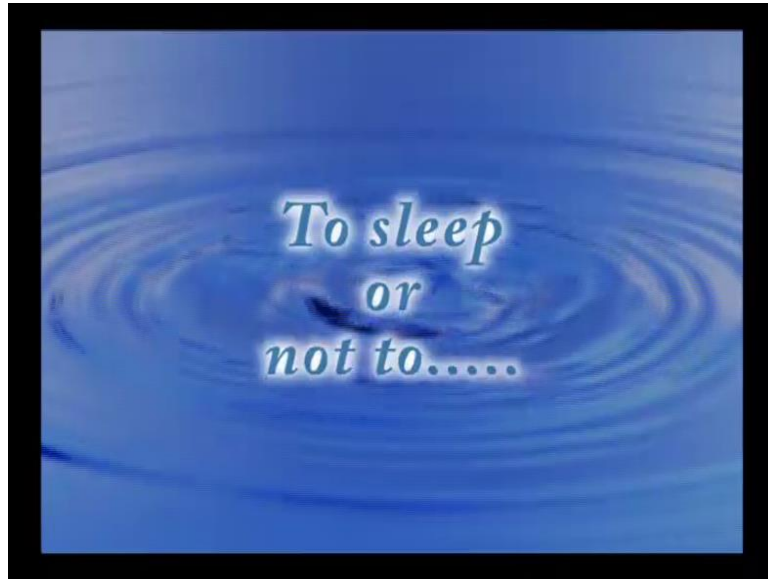


**Selected Topics in Psychology  
Health and Well-being  
Prof. Alok Bajpai  
Department of Humanities and Social Sciences  
Indian Institute of Technology, Kanpur**

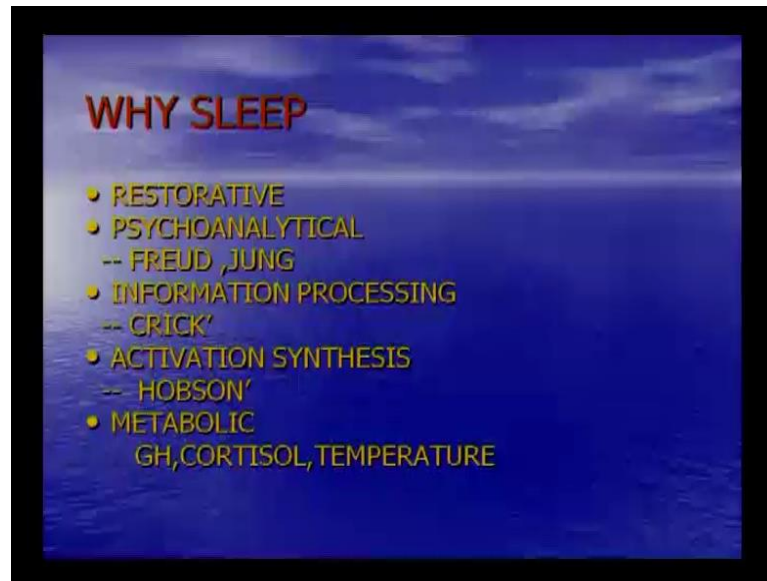
**To Sleep or Not**

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Good morning, I stole this phrase from Mister Shakespeare and altered it; if you have read hamlet to be or not to be. So, just put it like to sleep or not to and I have a reason for it is not so, random because sleep is.

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Sleep is one of the essential processes of all living beings. Everybody sleeps although the way they sleep, the time they sleep, the place they sleep is all different and reptiles also sleep, birds sleep, monkey sleep, mammals sleep everybody sleeps. It is such an essential part of life the other essential part is hunger and thirst and sex. These four basic human processes are the need for survival and they all control from one small organ in the head, what we call hypothalamus in the area surrounding it. But it creates a different connotation in different situation like for example, and is also the commonest complaint of people when they fall sick whether it is mentally illness or physically illness.

Sleep is the first thing to get disrupted; you have a pain, you do not sleep well. You have a pain in the form of exam next day; you still do not sleep and mothers when the kids are in class ninth and tenth. The commonest complain, obvious they come to me is that they sleep. The tenth exam guys sleeping fourteen hours; all mothers complains and when there is a board exam we all sleep too much it is a sort of panic attack to a parents. So, it is like it is an essential thing, but still it worries and people you sleep in various forms.

So, it is important we should know about it; like we should know about mind whatever we know. So, what is the function of sleep if it is so essential why did nature create. Why sleep at all? Because the other ends is the people says that if you sleep a lot you lose; there is a saying in Hindi. But there are some people who want to sleep because lot of discoveries has been done actually in sleep; lot of great ideas comes in sleep. So, it is

both hands. So, let us look at it why it is necessary because sleep is something, which has evolved with nature on this planet earth. We do not know about the other planets and the living beings there what we know of the living beings here, they all sleep and that is a physical regular activity. So, it must be inherent inimical to our life.

Why sleep? So, lots of theories has come in first was the original simplest theory was that you get tired you sleep you wake up fresh. So, there was theory which was restorative there is a restorative function of the sleep; it will restore your energy which you have deplete in the day time. Then, there was a man call Mister Segment Freud and Kal Yang, they brought out a brilliant theory. They started looking the whole thing from the angle of dream and as I said whatever in the simplest language, what I can tell you is that whatever you repress and suppress during the day time in your head, there is a phase of sleep and all that comes in the form of dreams.

So, for them it was like a release mechanism you cannot give suppressing and repressing your brain till eternity. So, brain also releases it. So, brains convert whatever you have possessed in the unconscious mind converts into dreams. This theory actually later on again came into this is the latest understanding. Do you see the name called Crick? Have you heard of him Francis Crick? Francis Crick after discovering DNA lost interest in DNA he switched to electro physiology and he started working on dreams. So, Francis Crick and there is a man called Hopson and Howard; they brought out us theory questions are current understanding that sleep is important for one restoration and rest.

Obviously, because you go into a deep sleep and you can be replete energy, but it is more for information processing whatever goes into your head throughout the day whether consciously or unconsciously and subliminally. You pay your attention your attention mechanism wants it or lot of information going in. Even while we are sitting in this room you have a looking at me and hearing about me; what I am talking, but lot of thing which are going into your head; even this light is influence in your head.

It must be altering some electro chemical activity in the brain, touches doing it all this par throw of information, which goes within a day it has to be processed otherwise your computer will shut down someday. So, what happen are the phases in sleep where all these information is activated? So, the processes activation and synthesis they activate in the form of dreams and in the form of other things activities that happen in the night and

the brain cells eliminate what is not necessary. What is necessary, what fits into the system and the past memory that is saved? So, whatever we learn in the day time you all must have experienced this.

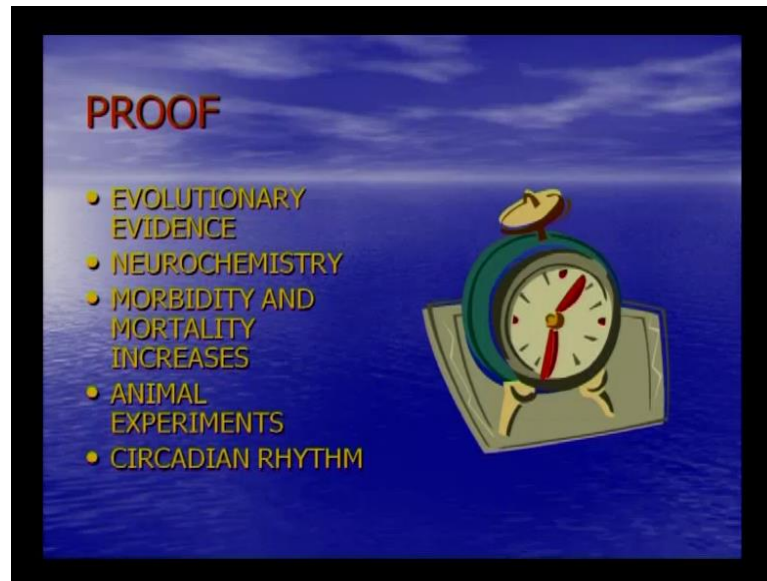
If you do not sleep just before your exams and read too much it feel sort of burn out just 1 or 2 days before exam. It is because the brain is not getting time to process it and that is why it is always told that if you have an exam sleep well and then go. Because brain will get time to process all that and categorized the content of the information into the right slots in the head; otherwise it will all be haywire it will be too much to handle. So, brain activates eliminates and synthesizes that is one very important function with the sleep.

In fact, whatever you mug up in the day time do not think that you have already mugged up; it has to be consolidated in the night. So, if you make people not to sleep first complain they start is that lack of attention, they cannot recall; they are forgetting and there is one big sign in psychiatry also lot of people they thing is I am unable to sleep and I am not able to concentrate all that is related you are not able to concentrate is related to your lack of sleep or disturbed sleep. Metabolic obviously, is one of the reasons that nature has evolved.

We all would not have grown up if there was no sleep because one of the important hormone called growth hormone is secreted in sleep; you are there is a hormone call crustal, which is which make you fight all the illnesses and all the that is also that is also link to the sleep and more. So, the temperature of your body the temperature cycle is link to sleep. There are certain phases in sleep when the temperature is the highest like when you are going off to sleep your body temperature is the highest the core body temperature and as nights falls it is the lowest in the morning and that is the time when the cordage level are higher.

So, it is all very very fine tune and it gets disrupted by our life styles, by our food, illnesses so on and so forth by our thoughts, but nature has fine-tuned. It is if somebody is left in a situation with there no disturbances actually theoretically body should not fall in it may age and die we do not fall ill. So, there is nothing to fall ill what is perfectly matched and their feed-back systems, which actually do it to sleep has a definite role in your survival; it is not just by the way that you have to sleep to gain your energy.

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What is a proof; what is a proof that you should have proof when we say all these you should have proof; one is evolutionary evidence dolphin sleeps with one half of the brain sleeping; the other half is awake and when it switches other half sleeps one half keeps awake. Cats, when they sleep their eyes are roving; the proof is neurochemistry when we record the some chemicals in the blood they keep altering throughout the night and these are essentially brain chemicals, who they grayer and get metabolized if you do not allow people to sleep; how long they can survive four days, five days, six months.

But it has been shown that people, who sleep more than ten hours and people who sleep less than four hours are more prone to having illnesses bodily illnesses, diabetes, hypertension, heart attacks; there is a link with heart attack the most of the heart attacks happens in the morning and some of them has sleep disturbance in the night. So, all this stuff is a proof that sleep is essential animal experiments. Obviously, you keep a rat alive and not allowed the rat to sleep after few days its starts the running haywire without any logic, circadian rhythm.

You know what circadian rhythm is no you all of study physics is there time is there something called time, where Julian Barber says there is no time; you know Julian barber Julian Barber is says that there is no evidence of time. Time is a clock, but clock is a contraption made by human beings everything is going on the nature. So, could there be time sleeps says there is time actually; time is not the time which we use seconds and

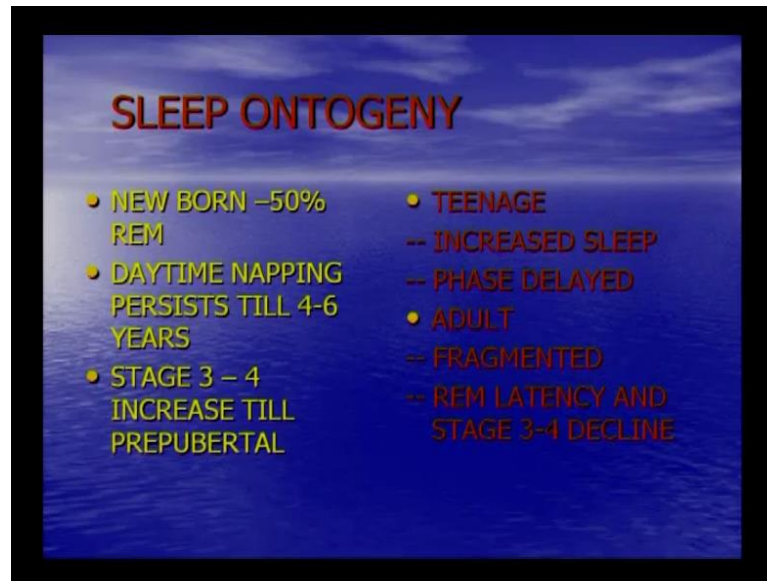
minutes and all that. But sleep we have to measure it through this because we do not have any other tool to measure. So, we wanted to find out whether there is rhythm in the nature we know, one year revolution twenty four hours rotation we know all this.

So, there is there a rhythm in the human body when there was no electricity what was happening it was all link to sun light. There is sun rise again there is no sun rise when we rotate and come in front of sun. We get up work through the day there is a sun set you sleep whole body was link to that, but in the free flowing experiment it was done then man was put with food and everything in a room, which was built of lead and sound proofing and everything and lower downs about twenty feet or something and all air condition and everything and sound proofing was such that there was there would be no peak fluctuation of electricity. There would be no traffic vibration reaching their thrum.

So, this man was insolated in that chamber no clock nothing; there was a uniform light uniform sound and it was left there. So, the natural rhythm of body came out with twenty five hours actually. There is a natural rhythm of waking up and sleeping and all that its runs to twenty five hours, but we have twenty four hours. So, anyway nobody try to change it to twenty five hours that would have mental lot of problems in the world. So, it is all right to be twenty four hours you free with them twenty five hours and your world rhythm is twenty four hours.

The other proof is that normally eight hours after getting up from the bed we feel pressure of sleep, which is for twenty minutes or thirty minutes, which is natural. All of our sleep and waking is queued to light, what we call environmental queues that givers. So, people want the sleep in the afternoon which is fine, but life style will leave you if you do not sleep so, it is slightly untied nature.

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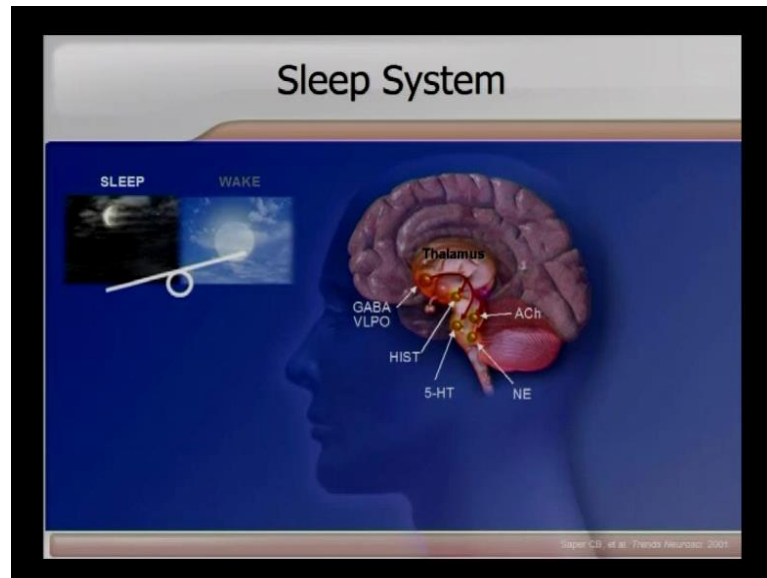
This is how sleep develops in us and new born sleeps for how many hours eighteen twenty whatever; they wake up just for milk and all that cry and, but when you record I will tell you just read this word call R E M. New born fifty percent of their sleep is dream sleep, I we do not know what they dream. Because we do not have any way of recording it by the time they starts speaking the dream sleep has decreased and they have forgotten everything.

So, knowing the dream of the first tear of life is still big challenge, which we face we really do not know how to someday we would born to listen to that you never know you never know that like people at least Hindu mythology believes that you have born with your past what they call. So, you know your past life you do not know even if they tell us their past life we cannot go and check unless that the theory of retro causality in quanta physics comes true; retro causality is possible when go back. Day time napping persists till four to six it stage three to four is a deep sleep, which increases till pre-pubertal, but teenagers have the specific problem.

Actually even brothers get angry about they do not realize that teenagers right from twelve thirteen to roughly around seventeen eighteen, they require more sleep than adults. If adult requires eight hours that teenagers require at least eleven hours, but eleven hours sleep can take away the happiness of family; because that will be board

exams or your school and all and no parents can tolerate this, but they do not know the biology so, excuse them.

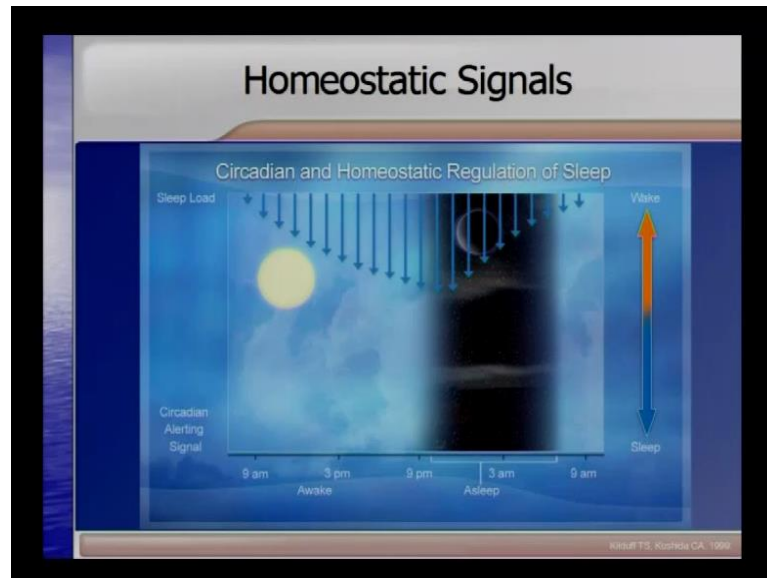
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So, normally this is how sleep develops this is what I told you see this this thick thalamus. These all chemicals GABA, histamine firehouse serotonin; these four five six chemicals the interplay of these chemicals makes you sleep. There is a certain chemical like 5-HT it is called serotonin plane in simple language. Serotonin, this is a very high level when you are going off to sleep; as you sleep serotonin levels falls the other chemical GABA increases. So, this complex interplay I will just I will come back to the slide once; I show you what normal sleep cycle is.



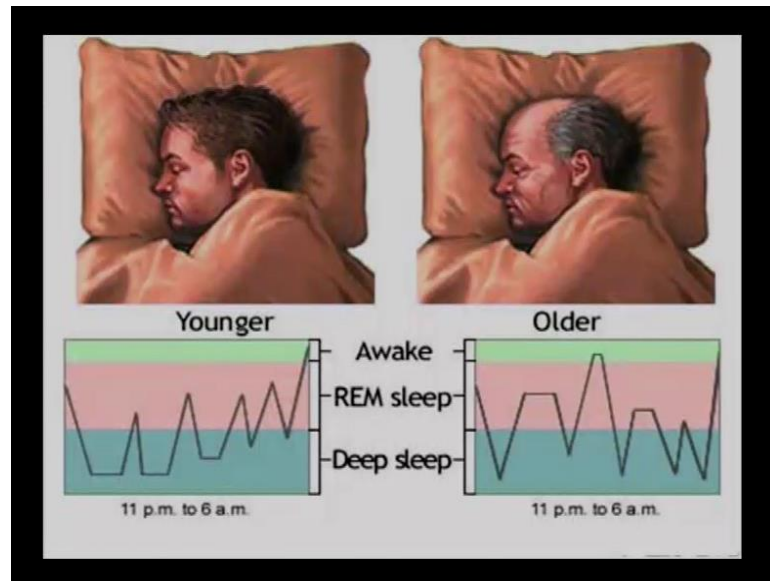
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So, this is like. What is the function of brain basic function? Have you heard this word called homeostatic? What is it? Gaining balance, brain has to gain balance if it is going too up too much have it will bring it down whatever a process if it is going down it will bring up. So, all this signals like you see this circadian rhythm is there, free flowing cycles in twenty four hours and brain controls this this is how it controls 9 AM 3 PM.

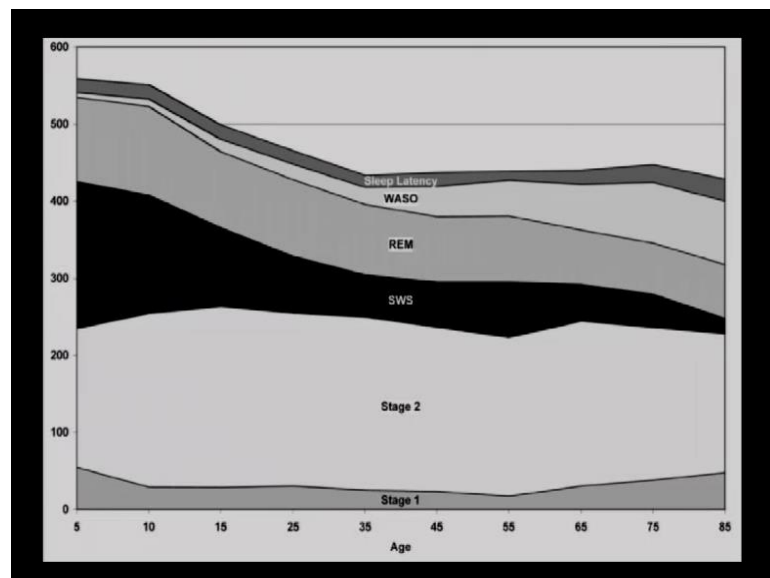
They light all these things information about lights information, about your hormones information, about temperature information, about your food status information, about your glucose level, your natural running rhythm brain balances into creating a cycle of wake and sleep. This all can be over written by your thought this all can be over written by your emotion, if there is no problem you may actually sleep well and all there is a problem you may lose your sleep. So, thought can again override the whole thing.

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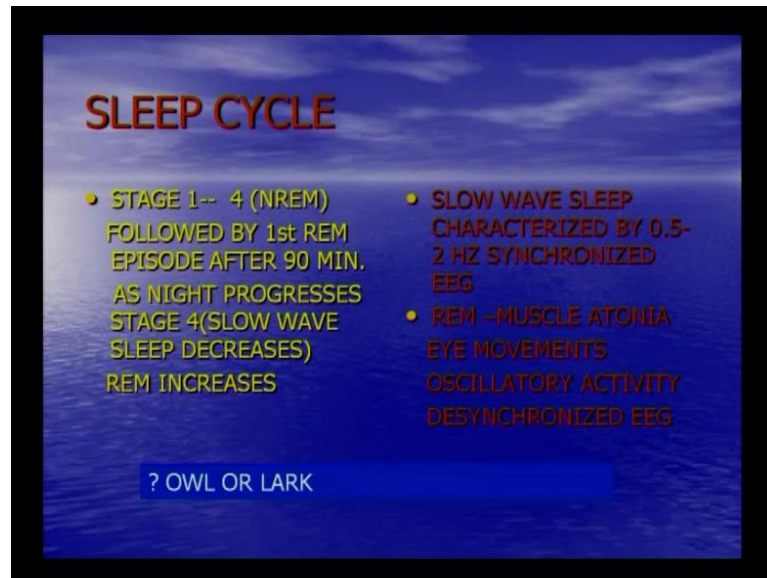
We all know as you grow old what happens you can lose sleep at their every small thing you lose sleep in love, you lose sleep in exams, you lose sleep in death, you lose sleep in when you are too happy, when you are too sad and you grow old your sleep hours decrease what I call it is a cotta decreases. So, if you have a cotta of fires and if you naps off for two hours in a day done you will only get three hours, what to do young people sleeps more.

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These are the stages of sleep. Let me see there is another slide.

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Just see this previous slide and then I will tell you read this words REM, SWS, stage 2, stage 1. I am just telling you the normal sleep cycle. There are people who come to me and tell me that they dream a lot is it normal, dreaming is normal. It is like a movie watching every night watch your own cinema; the only trick is that you cannot remember most of it sometimes. In fact, lot of great discoveries have come out during sleep only, like there was this there was this guy who discovered a chemical called histamine in the brain. He was trying to find out how the nerves the brain cells communicate with each other. Electrically, they had seen they had seen the frog's nerves they used to induce electricity the leg used to jump that may electrically if we know.

What happens they are different neurons; how are they connected to each other because there is a gap between two. Last time, we saw it hundred million neurons with hundred million connections and all that. This guy was so tired that he was sleeping in the night; he saw like the two tubes and at the end of the one tube there was a drop, which came from nowhere and it went to the tube. He woke up that is what happens in the nerves electrical signals comes till the end of this neuron the electrical signal converts into a chemical signal, one chemically secreted which goes to the top of the other neuron and this chemical signal turns into electrical signal in that simple very intelligent.

So, you can create a space and between these two chemicals work rest of it is electricity. Now, this chemical disturbance chemical fall the level of chemical in the brain the level

of chemical between two neurons determines whether you are healthy whether you are ill whether you want to sleep whether you want to eat. So, we are just robots are we controlled by electrical and chemical signals. In fact, we are because; however, hard you may think and; however, strong you may think unless you train your mind really to control these chemicals which we do not know right now.

So, it was certain chemical like serotonin, I am just giving you very very basic example like suppose in a certain area of brain between this set of neurons and this set of neurons should be say  $x$  number of serotonin molecules and it decreases to say  $x$  minus 10;  $x$  minus 10 can create anger;  $x$  minus 10 can make you angry  $x$  minus 100 can make you feel suicidal, really that this happens in a certain area. Suppose, you make  $x$  plus 100 you may suddenly without eating you may start feeling very full. So, all this drama is continuous going on in the brain this is how it happens serotonin falls there is a stile colon increases and you switch from one phase of sleep to another.

All mathematically done very well control very well control nature, I think is the biggest mathematician and nature knows where to play the trick how much to control. So, what it happen when going after sleep you go into stage one, which is a lighter stage of sleep and you go to stage two even further lighter then you go to stage three and four; stage three and four is deep sleep. So, people actually complain that I have not slept well for very long are the people who have not gone into stage three and four for very long, that is a real restorative. You are real, your body is relax your respiration is working at a slow process your mind is silent; your mind is not into a lot of activities your brain is slow down you can and then after ninety minutes the first dream period triggers off.

What we call a dream period is REM rapid eye movement, you see this word call REM this is rapid eye movement. So, we got this rapid eye movement and then we call the rest of the stages non-rapid eye movement and then you dream for twenty minutes. Then, again you go back to stage two, three, four then again you dream for twenty five minutes; then again you go to stage two, three, four; then you dream for thirty minutes as the night increases, the dreaming period increases. The deep sleep of stage three four comes down that is why most people when they get up in the morning are actually dreaming; the longest dream period happens towards the morning.

Deep sleep happens in the first half of the night and dreams happens later on and as you grow in the night then dreams becomes more elaborate and livelier. So, do people dream in the deep sleep? Why is called rapid eye movement? It is an evolutionary process I told you about the cat when the cat is sleeping the eyes are. So, when you are dreaming can you act on your dreams? Why? Nature, any when you are dreaming can you act on your dreams; what you seen can you do it the actions no now when you are sleeping every night and you watching a dream can you act on those dreams. Regulate you can, but lot of training what I am saying that suppose I am dreaming that I am dancing with whatever Kareena Kapoor. Let us not there anyways can I dance at that time.

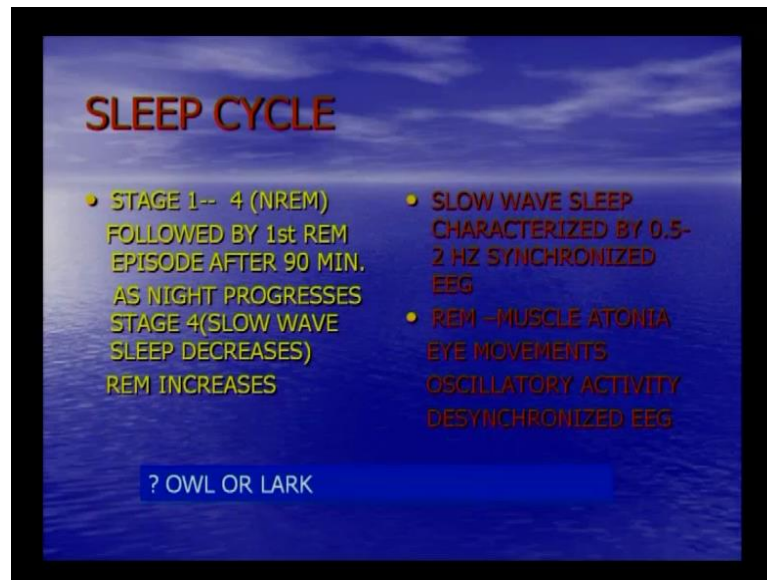
Now, if you act on a dreams it is a disorder it is a disorder this is what I love is this see there is a beauty it should be mystified as a whole thing if you start acting out at your dream you will hurt yourself and others. So, what the mind does is it paralyzes your body, your hands, legs everything is paralyze; the only muscles which are working one is this breathing operators. So, that you breath and do not die and second is an eye movement, which we call rapid eye movement both eyes are moving your eye your eye lids are close, but your eyes are moving and you are breathing you do not act ordinatorium. If you start acting ordinatorium become then becomes illness there are certain medicines, which we give for other things.

There was medicine can disrupt this crematorium levels and those people act out on their dream and they actually hurt, but why has nature done this? What is the point if eyes are not moving rest of the thing this also should stop? What do you do when you watch a movie? Your eyes move and the movies are going on your head at that time. Your eyes are moving you are dreaming there is a visual dream going on your head. But this again is an evolutionary thing when people used to sleep in jungles, there were lot of predators and you had to save yourself from them. So, all these scanning and the lighter stage used to help them scan the environment that evolutionary trade has come down to us.

We are still scanning there been security of getting predated is still there in us whether if we have built a houses or castles or whatever nature knows that it is not going to work actually does not work when it happens when it happens it does not work. So, that scanning may be some day it will be very useful for us; this is one evolutionary thing. The second dream, as I told you are important for information processing we also dream in the deep sleep. Have you heard of something called thought dreams? Is it difference

between the dream of deep sleep and the sleep of REM period? REM period is visual dreams how many of you see colored dreams or dreams black and white color full colors it was always so.

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I do not know because of plethora of colors, which we see these days bright and the artificial colors, which have been created, may be they altering the whole grey scale to colored possible. But there are dreams in the deep sleep they are non-visual; they are verbal dreams. People, who write scripts in their dream and sometimes they are just words it is rare it all depends on what is your orientation of pressure on your head. So, you can have your thought dream global dream in deep sleep and so, as I said it keeps going up and down slow wave sleep characterized by 0.5 to 2 hertz synchronized EEG.

EEG is the recording of the brain electroencephalography like you have electrocardiography; you have a electroencephalography. Brain, normally as I said muscle Antonia eye movement desynchronized EEG; if you do an EEG of the brain normal in our wakes state will you find synchronic or desynchronized way. Will you find one type of activity throughout the brain? Brain, normally has a desynchronize EEG if you to record from various parts of into go into deep and come up; you will find different activities all together; brain only gets synchronize in electrical activity only in two or three situations.

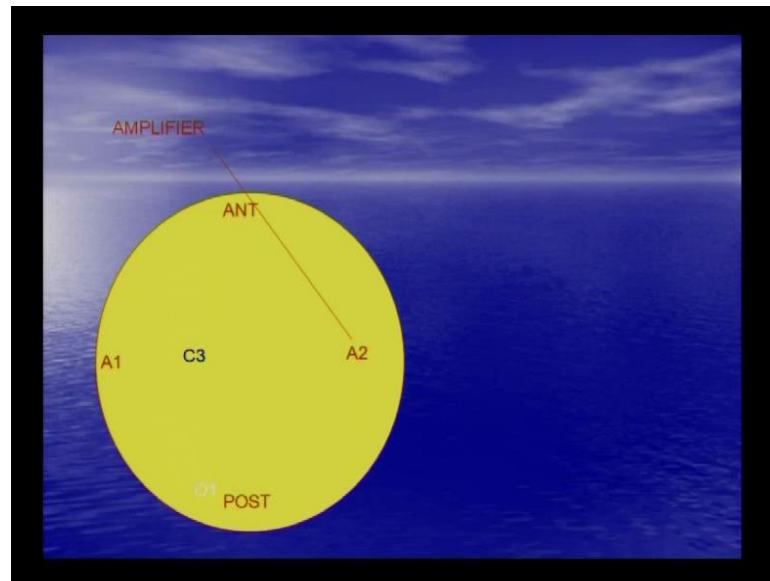
One is what we you know as appeal lapse and people have appellative fit the brain synchronizes when you are in coma or when the bodies in deep sleep. That is only time when brain synchronizes otherwise brain is running ulster shutter and you find different electrical activity. Normal activity of an awake is what we call alpha wave eight to thirteen hertz; they are the maximum on the back here is we visual animals, we are animals that is certain no argument about that are we visual animal or are we oral animals. See, how the nature evolved we bank more on eyes or more on ears; it survives through eyes what is more problem if you do stop hearing or you stop seeing. If you stop hearing it will be more problem or you stop seeing will be more problem.

But our brain still gear to visual cues, see hearing what a world first seeing or language. So, evolutionary thing is older brain a start developing from visual cortex the part of the brain and it is ear not in your eyes and the thicker layer is ear. So, there is an eight to thirteen hertz waves, which comes from here call alpha wave in a awake state in a resting stage that is good for your mind. I gave you some activity the activity increases from thirteen to twenty hertz and you sleep it comes down to four to seven and deeper zero towards. So, brain can alter all that.

So, there is a clock or generator or whatever is fitted in the head, but it keeps regulating why I am saying we are visual animals. Because if you close your eyes this electrical activity will change if you open your eyes it will change; if you close it to alpha ways will increase; if you open they will decrease. As you give stimulus to the brain the brains keeps changing still cute to eyes. Now, what happens is that because the language and all these things sounds and everything came later; although Hindu mythology says that the word came first and then rest came Om started everything. But anyway that verbal system is also very powerful, but its again cute to lot of it once suppose somebody does not see then the mind cues to all this.

So, it was always easy to hit arrow while seeing or to shoot when you see verbal is very difficult to hear the sound and shoot try that. Do not try driving with your eyes closed you want to cue to the horns and then drive done. Actually in Kanpur, you can do it Kanpur you should only drive with your eyes closed only respond to oral cues; here this is very important.

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This is how we record the brain put electrodes here and what we see I will just show you, but see this. What is this owl or lark? How many of you study better in the morning? None of you; how many of you study better in the night? For I am 48 years last 43 years I have been trying to get up in the morning and study and I gave up 20 years back since then I have never tried and I have no shame for that. People ask me to get up in the morning go for a walk; I have never done it. In fact, once I went and I got shocked actually went few steps and then I sat down and I watched people walking I was wondering.

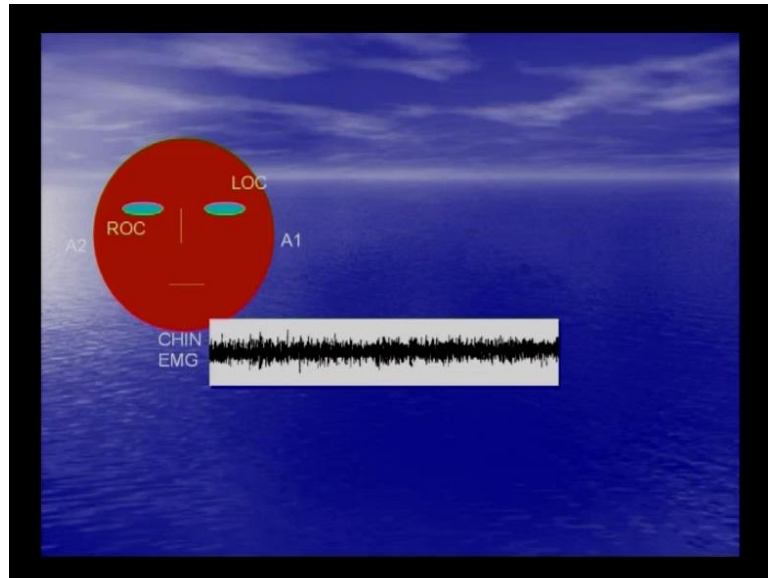
What is their problem, why do not they go and sleep? Why are they running in the morning ten kilometer, what is a point and then I stumbled when I started doing my sleep research in ninety three in man. Then, I realized that what we define in last 17 years in sleep is people have their own rhythms in the body. Some people are night owls some are morning larks. So, we are either night owls or morning larks, but it is about identifying your rhythm. But again I said this is not a very very clean categorized box of behavior they are just variations, but people can vary according to need.

But largely your core rhythm remains the same; if you are morning type person you will remain a morning type person come what may and you will disturb others if you get up. If you are night person you will keep awake even if you want to sleep, but ten o clocks



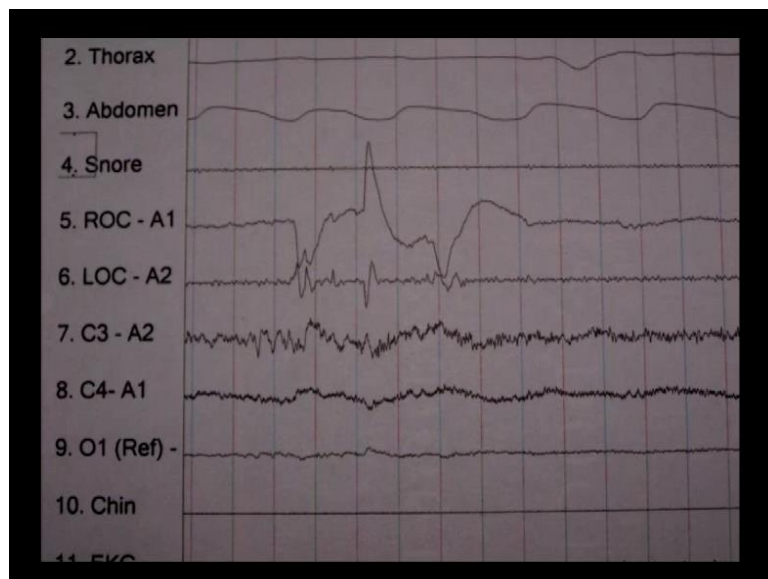
you will not get sleep. So, it is best to identify your own systems and work according to that.

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This is what we do when we record a signal from chin also because you want to identify whether it is a dream sleep or it is a non-dream sleep; muscle activity tells us it is muscles are relax.

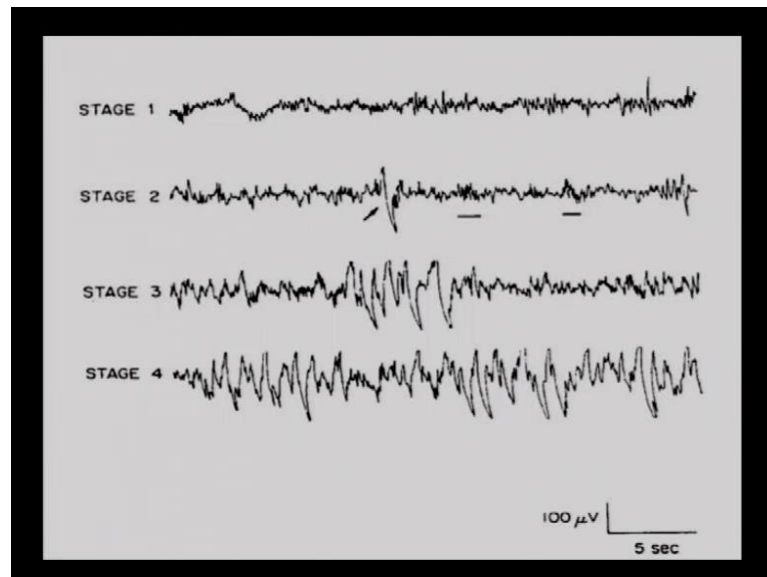
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This is a type of pattern when you do a recording of the brain while sleeping. It is all like let me explain it to you this is a chin; it tells you the muscle activity. This is occipital

here, brain waves from here these are brain waves from center. So, when you put the whole electrical activity in a pattern then you know which phase of sleep you are. Initially, it is used to be to be very difficult what we do what we call this is something called polysomnography.

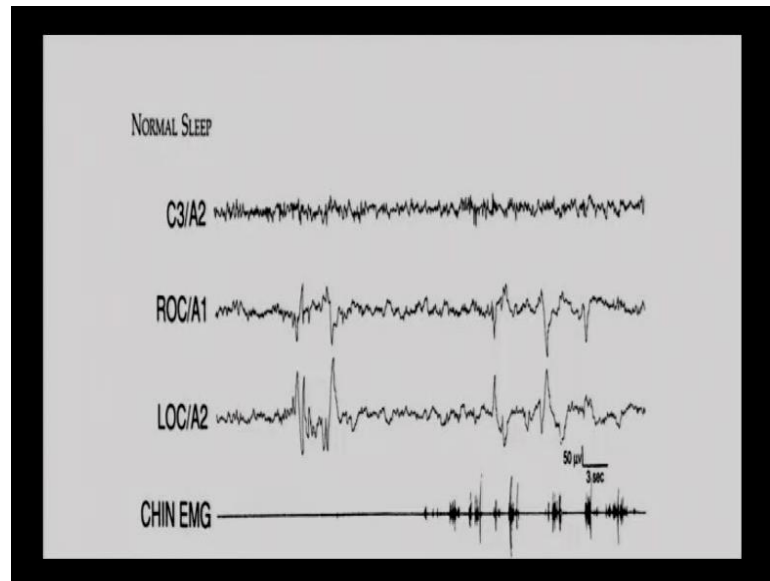
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Polysomnography: poly is multiple, somno is sleep, and graphy is record. Initially, when we used to do this we used to get records like this. Now, if I tell people who are doing sleep research now, they look at it like or they may be they hate us. What we used to do in initial years from 1960s and 1950s till I was doing we used to do this whole rims of papers of paper recording and analyze each frame like we divided the whole thing into thirty seconds frame in pox frame by frame thirty second. You were recording, whether stage 1 and stage 2 and then set back go back again and calculate how much was stage 1 and stage 2 very painful processes.

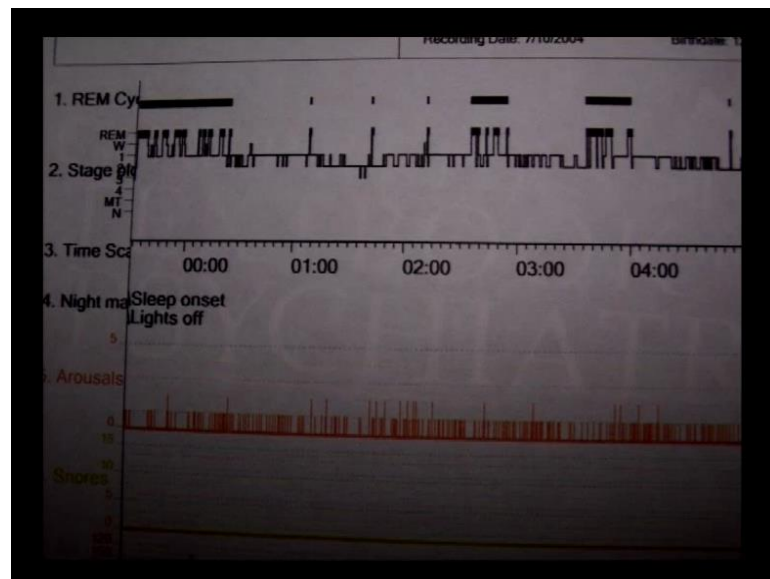
But anyway around 1998 and 2000 all these things started coming in. So, I have personally done all this paper pock reading. So, you do a recording for eight hours then give another three hours to score the data for one night. Now, it is easy now you just put it all these wires and you can measure respiration by putting a small transducer here and you can measure hand movements and all that putting some wires here. Then, you get just press the button and computer will record and press the button it will give you report also and you can charge your money happily.

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So, this is the type of stuff which we see I mean you do not have to go into detail.

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Once you have done then you have this type of record; it will exactly give your computer will give you how much of deep sleep you have how much of REM sleep; you have I will skip all this because this may not be of interest. So, what do you do?

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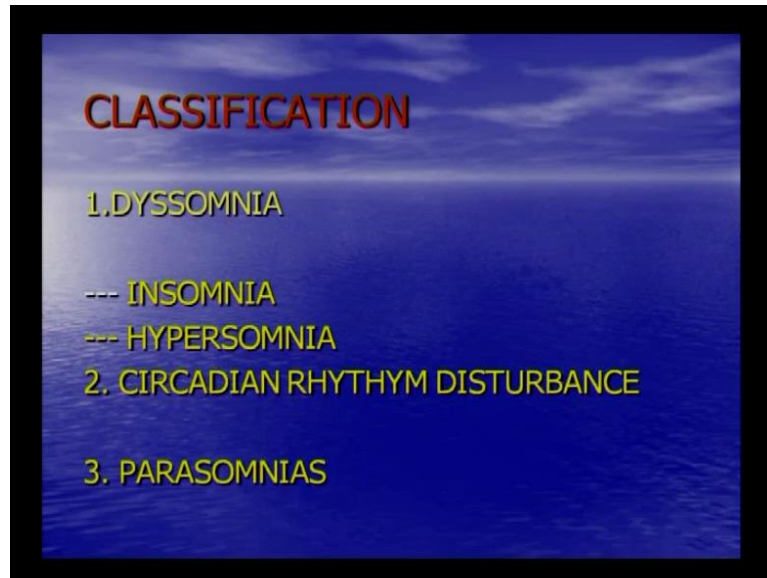
When people comes with sleep problems as doctors we have to take all this history, we have to look at complaint, we have to look at sleep schedules, we have to check the medical history, we have to check about sub sense abuse because all this sub sense abuse. But this is the most important person when you are taking a sleep history bed partner I do not say its pouch wife husband whatever it can be bed partner whatever it is. Sleep pattern has to be checked from the bed partner because this person who is having a problem may not actually realize what is happening.

Other person get disturbed by the snoring by the repeated jerking of hands and legs by when people there are lot of people, who talk too much in the sleep and they always afraid they may leak a secret. But it has never happens in fact, I know so, many people they who talk a lot and in the day time they are anxious, but I have never seen somebody some spouse or bed partner coming up that or marriages or relationship breaking on this issue that this word came out and who is this.

Why it is important, but partner is at least for one type of illness which is a very common illness; thirty percent of Americans have it; thirty percent of Indian are going to have it there lot of road accidents, which happen because of it there is lot of mobility which is happening with something called a sleep apnea. So, you have you have to check whether there is an episode of snoring forty percent of we I will just come to that illness there is

something, which everybody should know for jerking, for gasping whether there is an episode and the breath stops in the night and another there is mood changes and all that.

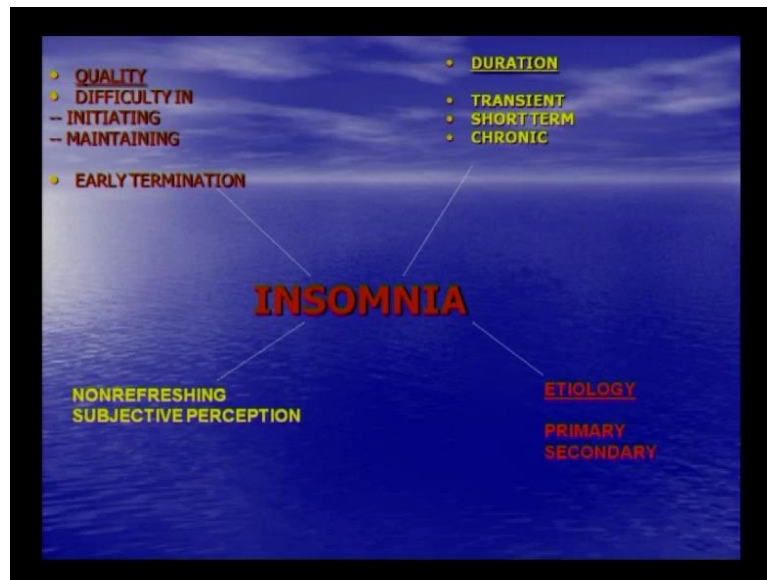
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So, let me just briefly tell you about a type of problems, which we see and any of us can suffer from all this. It is a medical thing so, it may not be of direct consequence except for doctors, but it is very important for people to recognize that there is something called sleep disorder like any other illnesses; like we are unified depression; like we are unified diabetes cancer; like we are unified people growing thin and fat. So, similarly the type of problems which people face is in very simple language either they do not sleep, which is call insomnia or they sleep too much which is called hypersomnia. The third is dipsomania you do not have a comfortable sleep because of various reasons. The fourth is what you call circadian rhythm disturbance.

This is also common for people who travel too much or work in shifts, for students lot of student suffer from circadian rhythm you have to study at night, get up in the morning, go to lecture similarly shift worker of one week you working in the night, the next week you working in the day time; when you travel across time zones from west to east pilots time zone travelling is one of the major cause for it. Parasomnia, you are sleeping, but still doing a lot of things, which you do which you should not be doing in the sleep; like talking in the sleep; walking in the sleep acting out on your dreams. So, just I will just try to briefly tell you.

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What all disturb can disturb insomnia; let us look at when people do not these are commonest complain not getting proper sleep. So, there could be problem in quality that you cannot get sleep; you sleep and get up early in the morning or the whole night you are not very comfortable. Post people will get up the commonest complain right now is that people say when you get up in the morning; we feel that we have not slept the mind has been working all the time their environmental causes for it non-refreshing.

This is the commonest complain non-refreshing is a subjective perception that I have not slept in the night duration wise this can be very transient every for two three days when you are stressed. You do not get sleep or short term from two three days to six months or it can be chronic things it on going thing where you are not getting proper sleep. The cause can be either because of it can be a primary thing like a sleep disorder in itself everything else is fine, but you are still getting a sleep disorder that is very rare that is very rare; the sleep disorder in itself is very rare.

So, it has to be secondary you either medically ill or you are having psychiatric problem or it could be environmental like for some cities in India; its hugely environmental the noise of generators and the noise of electricity going up and down, fan going up and down AC all this noise. Apart from this noise level in the society has generally gone up during the day time they got a mobile television lot of people, who keep watching television it is a noise of trouble.

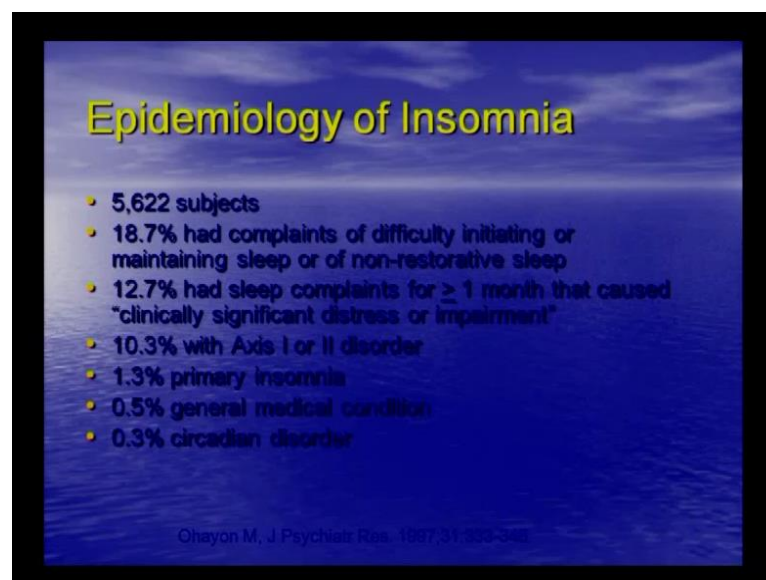


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So, it can take off your quality so one-third of population in one year suffers, one-sixth serious problem, one-twelfth is chronic; women have more than men elderly more than young.

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So, we just Indian it is a standard thing one good this is that whatever epidemiology has shown is more or less standard across the continents and all that. That is probably I do not know it is because of globalization or what the similar lifestyles you evolving in similar type of you would not that much difference between somebody living in New

York and Bombay; maybe there is a difference in nobody hunks on the road, but largely the structured is the same.

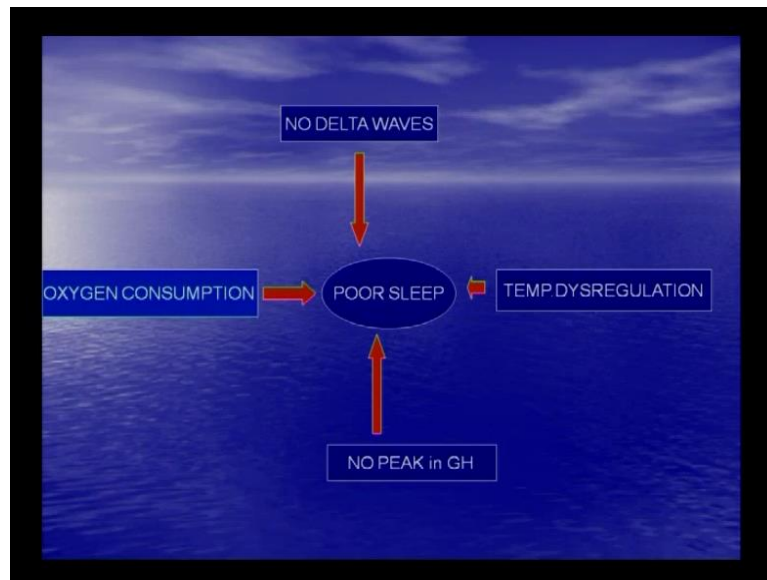
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I have cut down this. So, complaints has its as I said daytime drowsiness daytime drowsiness is directly related to not sleeping, fatigue, lack of concentration, anxiety, depressive symptoms, feeling of mind working during sleep. This is a very common sleep, this is a very common thing your stress and your mind keeps working lot of patience are depressive patients; otherwise normal people when they stress they think a lot and impetrate quality of life.



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So, poor sleep what we find is temperature dysregulation, the temperature should be lowest in the morning, but when we measure it's very high. No delta waves, delta waves just as I said zero to two, which is a deepest sleep. Deepest sleep we do not find oxygen consumption changes, there is no peak in growth hormone. In fact, there was let me give you an example there was a kid, who was all who was not growing up and all other investigations were normal, but the doctor was saying; obviously, did not know all this final detail of sleep.

So, finally, they send it to a psychiatrist and they say maybe something else is wrong; psychiatrist had some know-how of sleep. So, he checked out whether the sleep was or not and wonderfully some medicine was given to correct the sleep and within one year the whole growth had resumed just by simple manipulation of sleep because growth hormone is secreted in the deep sleep. So, there is no deep sleep growth hormone is less. That is one reason why kids who are having problems, who are restless, who are not sleeping well or fugitive, angry emotionally disordered, a lot of parents insist they do not give medicines.

But why medicines should be given is this because that is a growing phase; you can keep doing behavioral techniques for rest of your life beyond eighteen. You have all the time behavioral technique should be done, but behavioral techniques in itself is not going to do anything. So, medicine if that is a growing or learning period. So, if you can treat by

this final adjustment, but anyway I mean whoever prescribe should know why they are writing the medicine especially with children.

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### Morbidity/Co-Morbidity

- Objective cognitive/performance deficits?
- Quality of life: subjective deficits in memory, concentration, & work performance
- Psychiatric: prevalence of any psychiatric disorder is 2-3x greater in insomniacs, depression prevalence is 4x greater
- Medical: insomnia associated with multiple medical conditions, increased HD risk & impaired immune function? Increased mortality rates? -confounding factors.

Ford DE and Kamerow DA. JAMA. 1989;261:305-309;  
Mellinger GD et al. Arch Gen Psychiatry. 1989;46:1225-230;  
Kryger, Roth, Dement, eds. Principles and Practice of Sleep Medicine, 2005.

I will skip this data as I said.

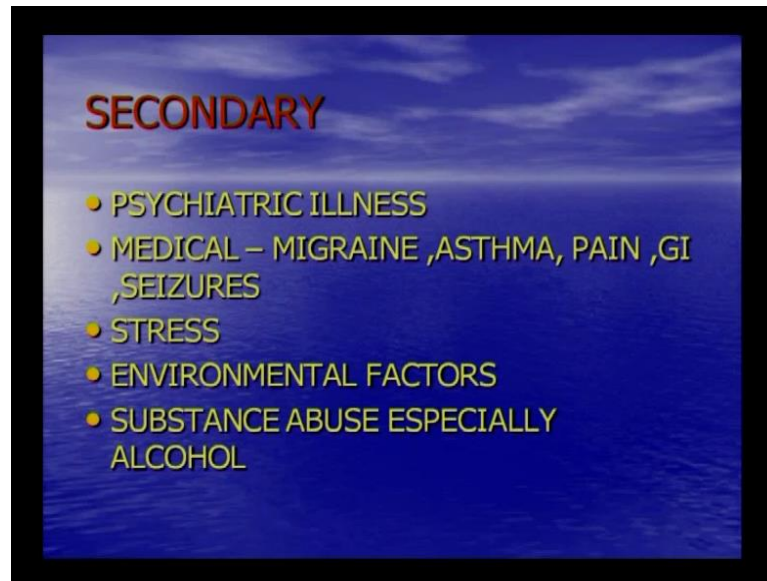
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### CAUSE

- PRIMARY INSOMNIA IS RARE
- EARLY ONSET
- ?BRAINSTEM DEFECTS
- LONG TERM TREATMENT REQUIRED
- INADEQUATE SLEEP HYGIENE

Primary insomnia is rare, early onset, brainstem defects, long term treatment required.

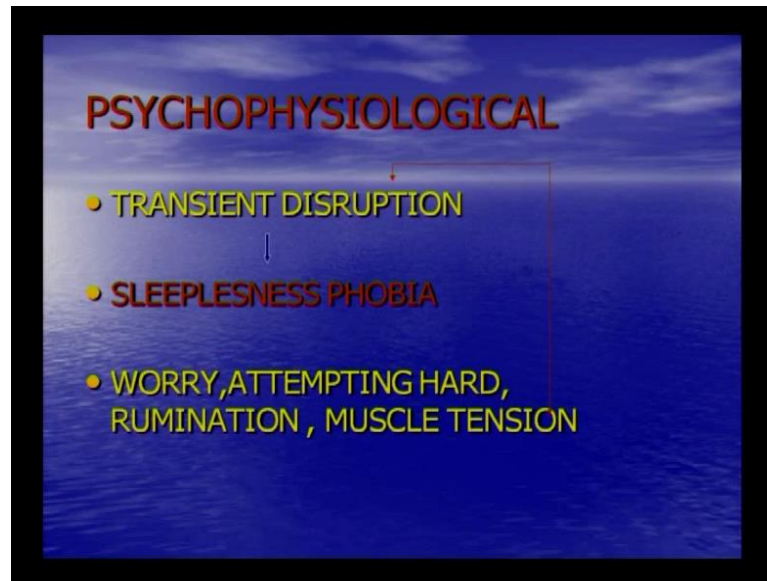
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Secondary is very important psychiatric illnesses, depression, anxiety, grief schizophrenia, medical can be migraine asthma, pain acidity. What you can acid peptic symptom, gastro intestinal symptoms seizures stress most common you have stress all the time environmental factors as we said substance abuse is going up in the society alcohol uses very short up; smoking and all that and everything alters if people think they can dream can it will not Shakespeare said it provoked at the desire take it away the performance about her call. It was talking in the sexual contacts that provoked the desire take it way the performance.

So, it will call does this people think that they can have two dreams and then sleep one or two days five days ten days they can have it, but beyond certain time alcohol destroys the sleep architecture and that is one reason when people stop alcohol they get into withdrawal syndrome. Insomnia is one of the first withdrawal symptoms that is because that whole sleep architecture is gone.

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Sleeping pills should not be taken for very long period. Psychophysiological sleeplessness phobia is this what people get into; nature somehow has done it in such a way at least that two activities, which cannot be done while you thinking one is sleeping the other is sex. Both these things cannot simultaneously go on with thought; because if you think you cannot do it and this a loop where people go into in both cases. Lot of you ask any psychiatrist who is treating people with sexual dysfunction physically they are all right in mentally they are it is all in the head.

They are watching themselves and same as with sleep try this try sleeping sometime; when you are actually not sleeping tell your mind that I want to sleep. You will never get sleep the more you try the more awoken you will get what happens. So, when people get sleep disturbance they get into this phobia. Suppose, they have to go to sleep at ten o'clock their mind start working at six o'clock in the evening. What if I do not get sleep I have to sleep what if I keep awake what will happen now they will keep fighting this?

So, when they go to bed the mind is already high tend up its worried; its attempting hard muscle stands mind stands I have to go to sleep and when your muscles stands and your mind stands sleep is a reverse process and they you try to sleep you do not get sleep again you confirm your own hypothesis. See I told you I cannot sleep nothing see I cannot sleep is self-created, but then once this start it done for three, four, five days the switch is on.

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So, anyway diagnosis is a clinical thing polysomnography finding we keep doing it every day. So, there are a people who have problem they sleep later; there is a decrease slow wave sleep increased muscle activity.

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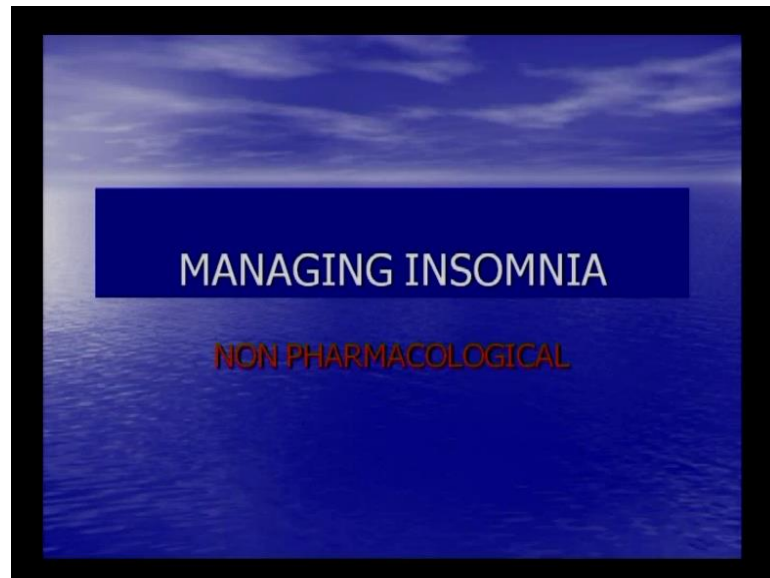


Subjective misperception is something, which when you record these people there is an adequate sleep; onset sleep architecture is normal everything is normal, but they still feel that they have not slept. So, what happens is what we call a cognitive, biological, discoordination biologically you are sleeping, but the third part of mind feels that you are



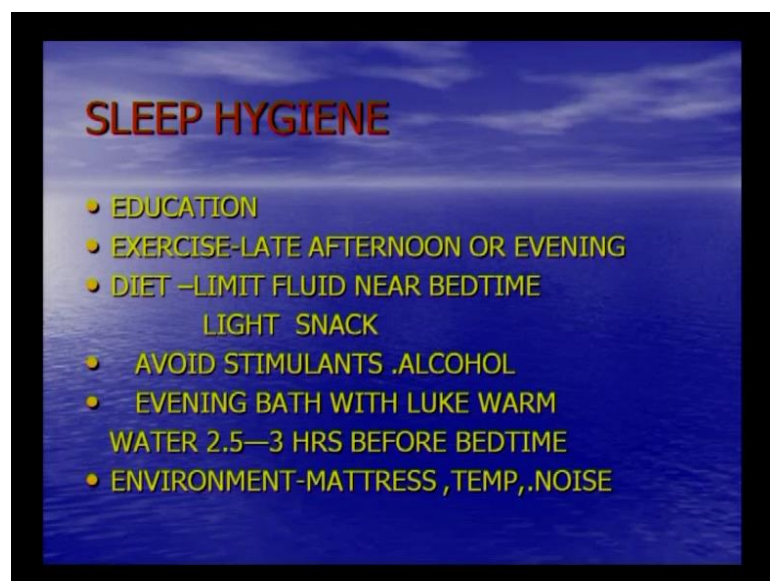
sleeping. So, when you get up in the morning it is like have been awake it can happen to all of us in periods of stress, but these people have persistent complain. So, the mind does not feel that I have slept mind can feel anything you may actually sleep for ten minutes and mind can feel that fine enough again as I said it is a day time thought which determines.

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Let me just not burden you with medication and all.

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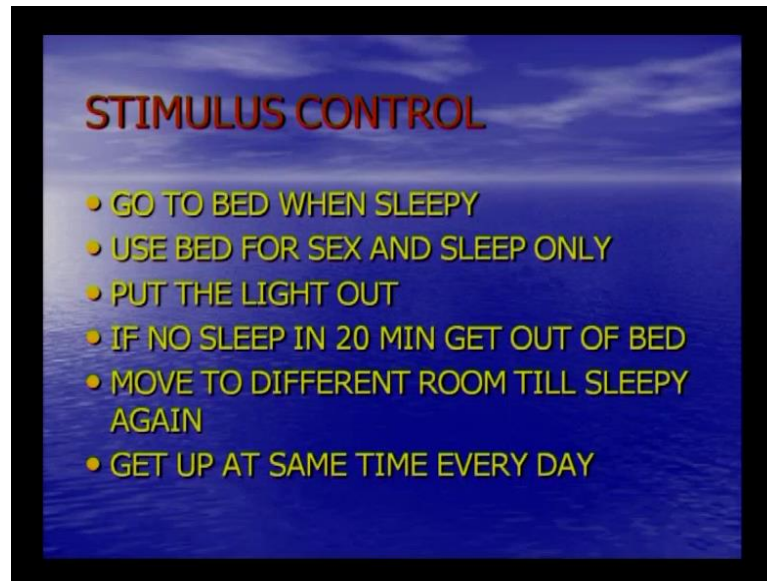
Sleep hygiene. Have you heard of this stuff? Have you heard of personal hygiene? It takes bath every day. How many of us bother about sleep taking hygiene of the mind? Education is for the people, who have sleep problems they have to be educated about sleep the process. Second is that you have to your body sleep is linked to lot of queues in the environment. So, these are suggested to which should be done on the daily basis by average people also, but any way once us sleep is disordered you have to do it as a treatment exercise late afternoon or evening is always for better for sleep than morning exercise.

So, if you have to sleep at ten o'clock you better do exercise at 6.30. No, you know it is like your body gets tired at that time and when the body has to relax it is already your sleep time. You do it in the morning then; obviously, it is you still feel one of the yoga gurus is in this country was successful businessman also. Suddenly, got the attention of this country and everybody said I said what is a benefit he says obvious sleeping well. So, I said of it tell me what is a routine he says no we have to go to Baba ji camp at 3.30 in the morning. I said what Baba Ji you get up early in the 3.30 in the morning you are learning to get sleep.

So, he used to wake up people at 3.30 make them walk for 30 till to their camp whatever. These are the people who are happily sleeping till eight o'clock in the morning. So, anyway sleep will improve simple technique. So, there is no you do not need a rocket science. Diet limit, fluid near bedtime, drink less near the bed time. Do not sleeps empty stomach lot of people who eat food at eight o'clocks and sleep at ten o'clocks and then they take breakfast till say 8.30 in the morning.

Twelve hours of empty stomach and disrupt you sleep because of the acidity. So, that British system is fine seven o'clock dinners and whatever supper or whatever you have to take at night 9.30 or 10 little bit light snack, but anyway it may suit or may not suit. But the heavy meals in the night always create problem avoid stimulants alcohol and smoking evening bath with lukewarm water 2.5 or 3 hours before bed time is a good trigger for sleep. So, people are not getting proper of sleep if they just do couple of these things and mattress and temperature noise; obviously, you cannot control all this.

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We can I think have a good mattress at least I think go bed when sleepy use bed for sex and sleep only. Lot of people when they do not get sleep they try to compensate in the day time and if you check most of them would be lying down in the bed for everything reading book, watching TV, everything. So, put the light out if no sleep in twenty minutes get out of the bed this is the most difficult part. We advise that if you do not get sleep get out of the bed sit read do anything do some light activity move to different room till sleepy again; come back to bed again you do not get sleep for twenty minutes, go back again; keep doing it till you start getting sleep twenty minutes.

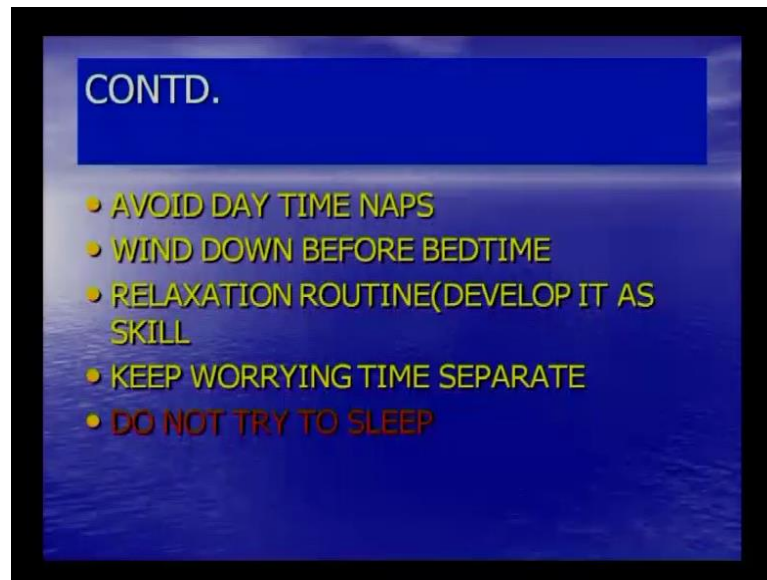
It may be seven times in a night; it may be ten times next three days, but eventually we will start sleeping what happens is that suppose people do not get sleep. They sleep at five o'clock in the morning, then they will sleep till ten; they will compensate five hours are already over. So, your whole phase of sleep is already shifted in the night; its phase advanced phase delayed rather your cycle is gone serious your cycle is gone permanently. So, you do not compensate if you get up at eight o'clock you get up at eight o'clock whether you have slept at quarter to eight does not matter.

Then, what will happen three four days later you will start falling asleep in the night in the right time. Suppose, you do not sleep and sleep from five to ten, five hours of sleep you have already taken in the process what have you done are delayed the night onset of sleep. Lot of people, who sleep in the day time for two hours they can get sleep in the



night because it is obviously, a quota suppose you have twenty percent of your quota is deep sleep you sleep in the afternoon twenty percent quota is over. So, what is left is all this jumping around in the night.

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Wind down before bedtime, now this is something which is very important keep worrying time separate. I tell people they most people complain when I go to bed I am thinking, I said why are you thinking at that time. You finish off your work sit for half an hour, take a pen and paper worry yourself to death. Then, once you are sure there is nothing more to worry, nothing more to think for that day at least; now if you want to worry you can worry endlessly, but everybody has a quota of worry. Set down your copy relaxes and wind down and go to sleep. These are skills, which has to be developed. How many of us has worry time, should be of well-defined worry time no issues.

Close your eyes, sit let everything come into your head whatever remains after ten fifteen minutes think about it find out a solution, what you are going to do tomorrow what you are not going to do sort it off. Any way you are not going to do anything in the night. No all my friends there are five hundred people in the country who are like me. Before I advise them, they do not have before and that is what I do most of the time. It is about training it is all about training you tell your mind anything; it will start doing it see I do not ask people to not think when they are involved in creative thinking; I have do not

stop myself also we are writing a script we have to think you are thinking about some theory you have to think.

But there is a difference between worry and thinking there is a huge difference worry is ruminative thinking. You observe worry sometime worry has a very typical quality and he can tell you more about worry the psychology of worry is that worry is very restrictive number one. It is like ruminative same set of thoughts get worrying you and they will not lead you anywhere like you gave an exam and your one paper is gone. What happens why you are worried about it now? Why are you worried? Anyway, its gone anyway you are out of the classroom, but you will keep worrying till the teacher calls you have been he says keep fine; you have been passed. He just tells you pass and you feels happy all your worry gone, but it is such an upset thing totally upset.

You had read a subject you some questions were asked you relied you knew or you did not know if you did not know you should come back and read it for your knowledge shake if you knew you have answered copy is not in your hand. It is in somebody hands it is with somebody else you are bothered about somebody whether he is giving you marks or not instead of doing what is in your hand. So, worry has this irritating quality, but half the human race is worrying all the time half more than half ninety percent people just worry. So, let ten percent who are slightly above it try it will work always.

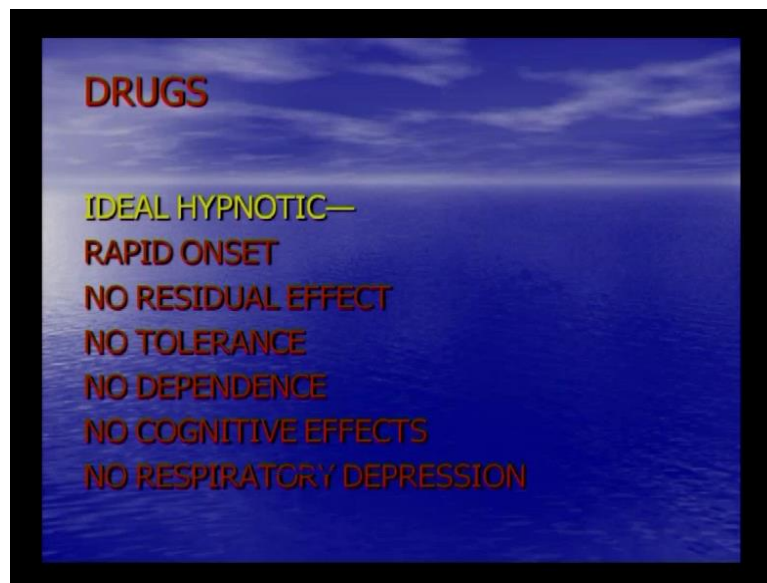
It is a fact most people see there is nothing to do you are restrictive bodily also restricted and people do not know how to travel in mind. Otherwise, they could not be KLM flight and still be in their village or where ever they are going. That is of that is trick of human mind there is focus on what you are doing right now is very difficult what you have right now is this. That is now it is it must have been in some time now people are very comfortable. One reason is they are bored they have eighteen hours flight they get bored what to do somebody tells you fly from Bombay to Sydney eighteen hours.

They say eighteen hours you cannot how much you will move how much exercise you will do. So, that is the boredom is the real thing and its see must people also cannot read throughout even if you carry books no one; what they reads I have seen it most people cannot read it movie is something, which is passive it keeps coming to it. So, it works reaction and all that. So, this type of activity, which should be done when people are not

sleeping passive which is they do not have to apply on mind keep watching, but most people get into something very active.

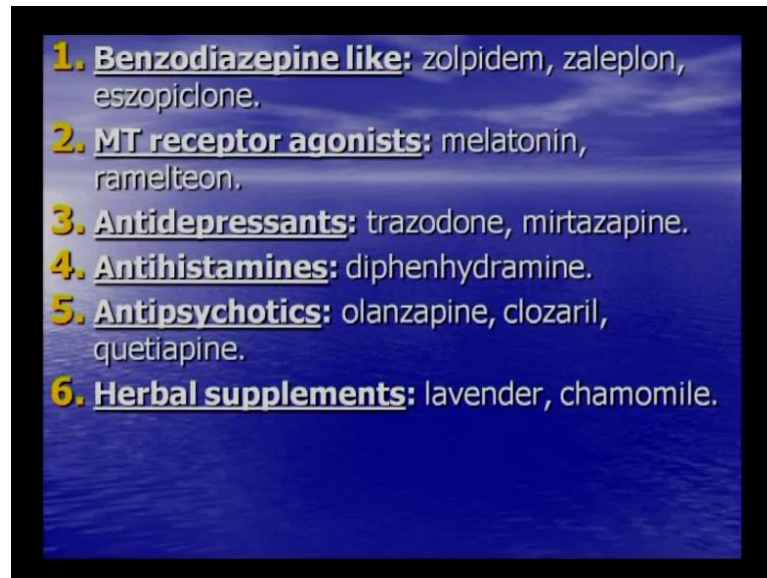
So, anyway that is our see there is nothing hard and fast about sleep whatever suits you if you do not sleep and you are happy wonderful if you sleep for three hours and you are happy wonderful if you are not sleeping and you have problem it is not wonderful its pain simple when you are working and do not try to sleep is the trick do not try to sleep.

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A drug obvious is the preview of doctors, but ideal medicines which you should have no side effect no residual effect you should have a rapid onset you should not have tolerance. Tolerance is that you take one pill today, then you have to take three pills three days later; because one is not working and no dependence when you stop medicine you should not have withdrawal effects.

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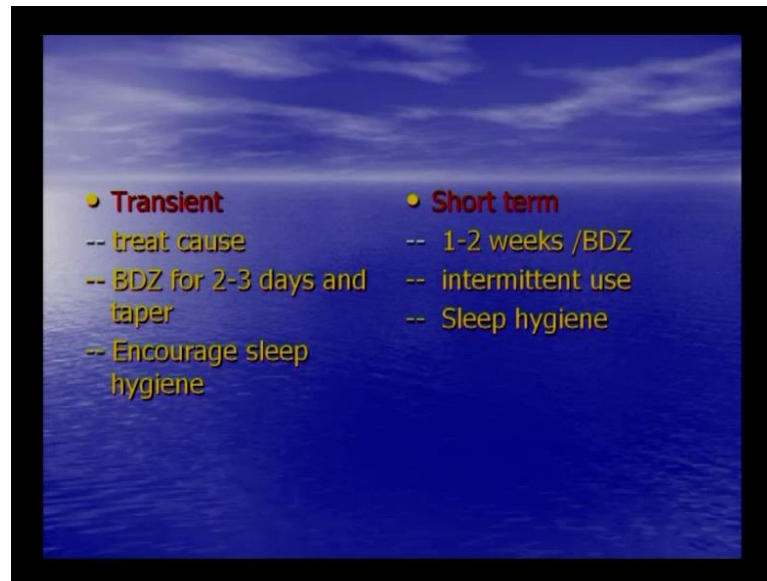
But those medicines we do not have actually right now; these are just group of medicines, I will skip these slides and tell you very interesting.

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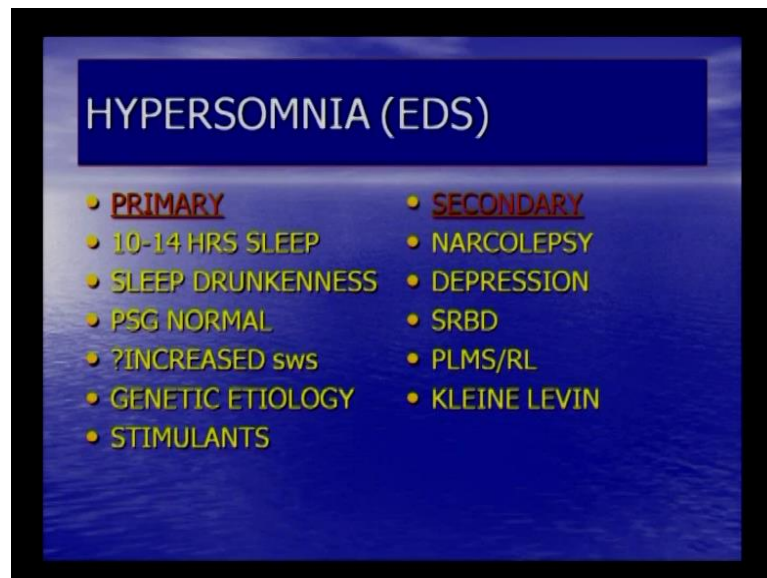
I think, these slides may not be very relevant, but these all medicines then they keep coming every now and there in the market. Sleeping pills are the most widely prescribed drugs all over the world by all physicians irrespective of their specialist. People are more addicted to sleeping pills than to air I think so.

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And W H O says that by twenty and twenty every second Indian or third Indian also take. So, I think we are moving fast.

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Hypersomnia is excessive sleep it has various very interesting illness called narcolepsy. People suddenly then doing something and they get into this episode, where they are excessively sleepy and they have to sleep. It was found in dog first and then in human beings rare, but other depression and sleep related breathing disorder there is a syndrome called sleep apnea syndrome; we wrote a paper from man client syndrome where you do

not find any cause the person goes into an episode of sleeping for days together; not getting up not eating not anything sleeps and then gets up and become shortly normal even syndrome has all this really.

They did not know whether there was an illness or not, but this syndrome definitely had a syndrome. He must he must be having what we call a obstructive sleep apnea. Sleep related breathing disorder is very common what happens is it is what we call an apnea.

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All of us in our families will have people it should be treated simple.



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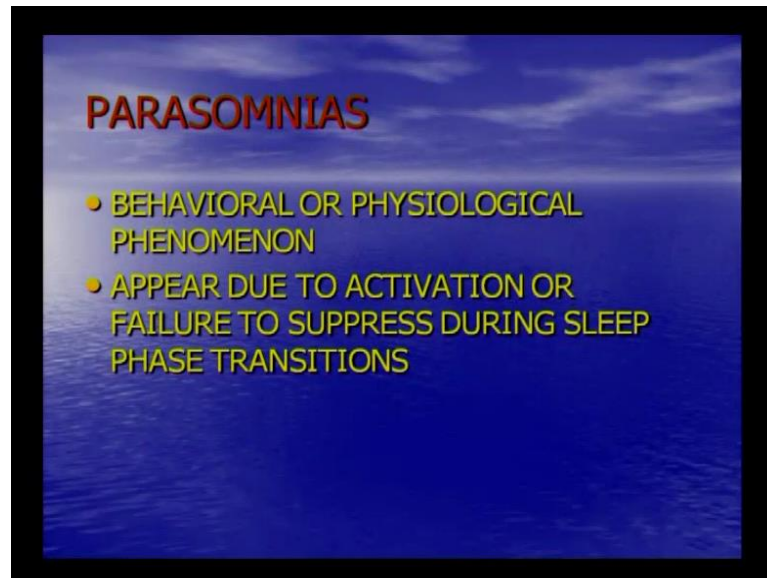
Because I will tell you why I will just keep this narcolepsy thing it we do not see it in India much although I have seen in Newman.

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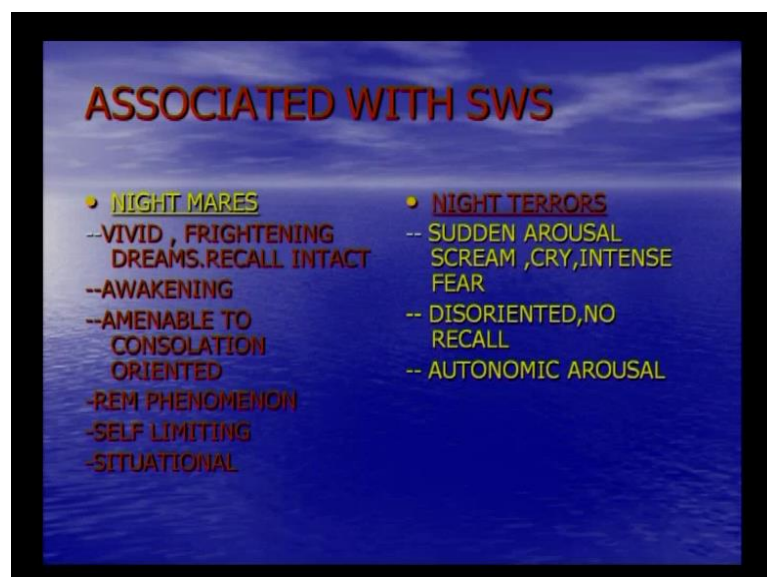
But largely ordinary doctors they do not come across all this. Ordinary means not ordinary in all that in the general setups. These are all very specialized this is mismatch between internal and oscillator and external demands like pilots like travel across time zone; hypersomnia fatigue distress delay. There is very interesting I was watching this television in one of the shops there is this character who is a ticket collector.

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So, in his house he has he does not sleep in the bed; he has made a berth which he folds in the day; night he opens on with the chain and all he sleeps and he made a window which is opening to the compound like a train window. Then only he can sleep. So, anyway Parasomnia is physiological phenomenon, which appears due to activation or failure to suppress during sleep some of these are very interesting because these are common also.

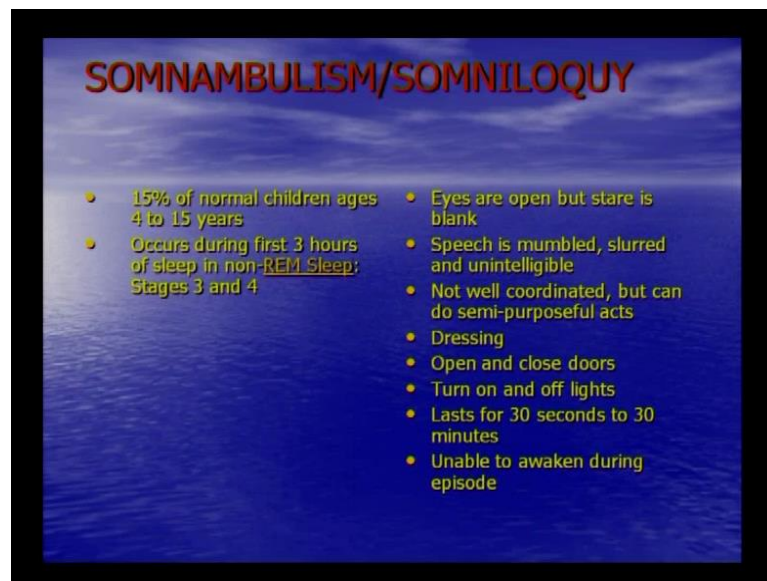
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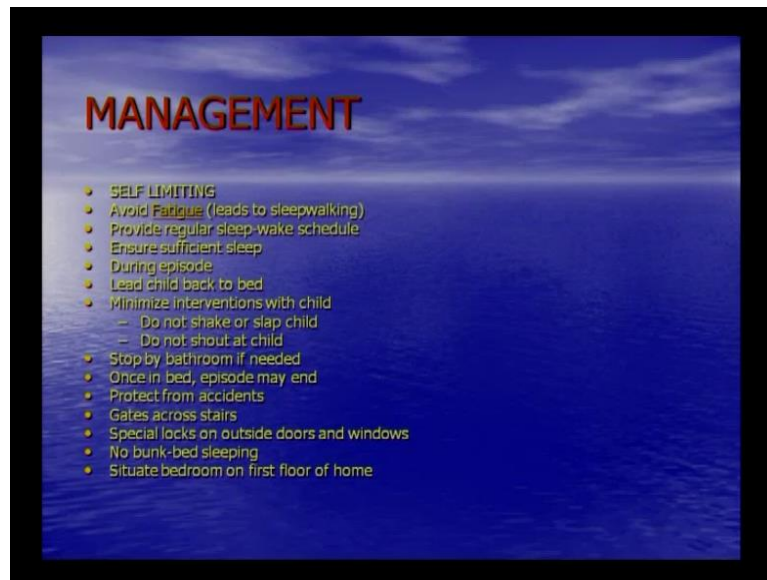
Night mares, all of us you know the English word night mare all of us had it. Kids have it they wake up suddenly in the night sweating and crying and all that. So, it could be they must be seeing a bad dream, but these are very common things when kids grow out of this versus there something called a night terror. Night terror is not associative with any dreams. So, waking up from bad dreams is different from suddenly getting situation where the child is very restless and, but nothing has to be done just consolation hold the child and things will go off.

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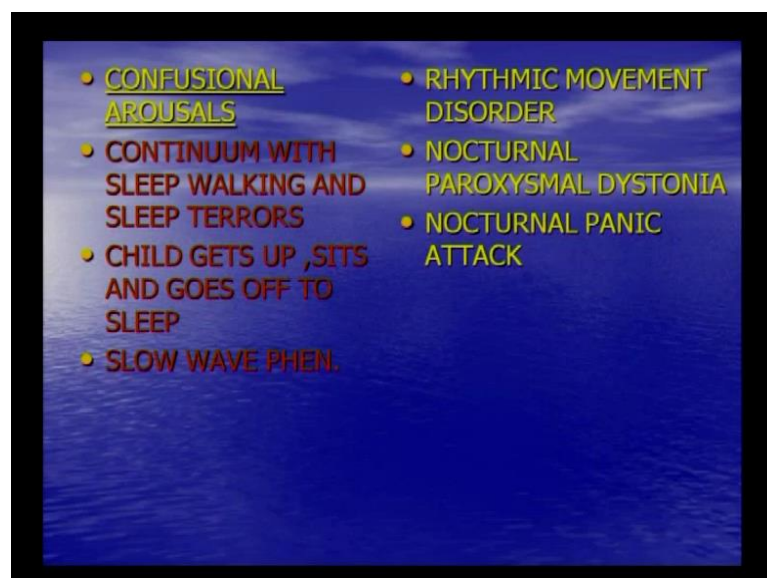
Now, taking in the night or walking in the night you have seen a lot of movies on this. One of the good one was film call Khamos by Bidhubinodchopra initial days and there was a film. So, lot of people lot of people mumble and talk and all that jokingly I tell them as forcedly wife which wife, which comes and he talks in the night I said you allow him to talk in the day time stop talking in the night. Anyway, but it is a not an illness it is a physiological variation unless it gets serious we do not really treated for kids it is very simple.

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Kids having sleep problem, they should end their play they should not go to the bed tired what the assumption is that if they are doing it and tired and goes off to bed that is not for kids whatever tiredness activity they have to do they should do it and finish it at a certain point of time from that time they should wind down slowly to more sedentary activities read or comic or drawing or whatever. So, that when they go to bed the muscles have already relaxed; it is already self-limiting avoid fatigue should be avoided and you cannot if child is having problem there is no point shouting at him. So, you have to protect that child does not hurt and do all that stuff.

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But these are all lot of people when they get up they confuse really believe me there is an entity like this. Confusion arousals when they get up they really do not really do not know which way. So, think they are happy people who get confuse when they wake up and does this fault here sleeping you are happy do not want to get back to this, but then these are all small kid beats here and there. Let us see let us skip.

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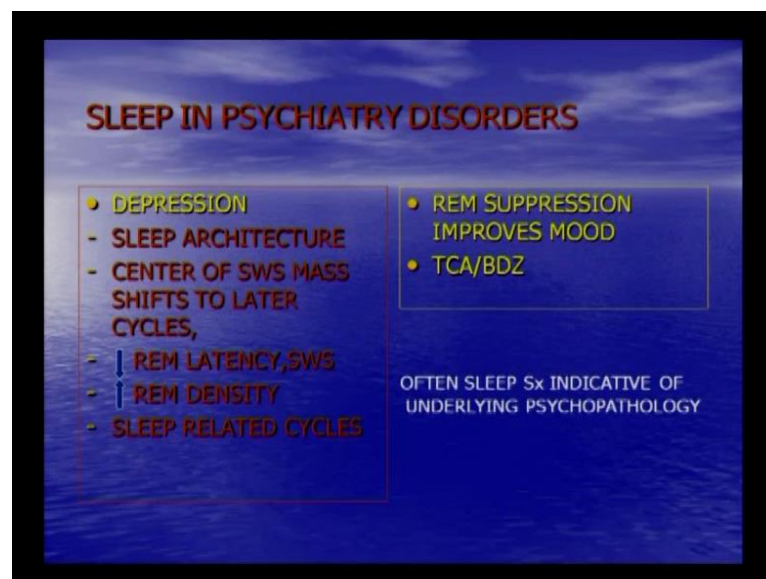
This is something there are lot of medical illnesses, which happen during sleep bruxism like people grind their trite; these are common problem, whose some kids who have knocked down analysis they pass urine in the bed in the night, which most kids have the control over bladder by five or six years of age. But during the time of stress they again start doing it human being this is this is the mind is frontal row controls everything. In extreme states of fear in extreme fear of insecurity people urinates even adults mind just loses it.

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REM behavior disorder I will just end with this; people who start acting out on their dreams normally body sterilized, but some people when they are dreaming they start acting out. So, people shout too much in the night or throwing their hands here and there always suspect that there is a possibility of because there is a risk a person can hurt himself or and this is very treatable situation so.

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Well, just skip this sleep in psychiatry disorder. Now, let me just finish it with the obstructive sleep apnea. Obstructive sleep apnea is disorder breathing during sleep when

people lay down this this pallet falls back and already the flow of air is restricted for some people the soft pallet, which is a hanging thing just goes and hits a back wall. So, there is a whole lot of problem and air coming in and out. Every time the air cannot the body the mind throws it and the minds get awaken in the process.

In the process what happens is that one remains in the lighter stage of sleep all the time, oxygen level keeps falling from ninety eight, ninety to seventy four, forty percent snorers have that and what typical is that the partner will tell that they are snoring increases in a crescendo, which is a peaks suddenly for ten second it feels that the person stop breathing. They can also shake their hand or have gags or something like that and they are multiple approach showed lights during the night hundreds and all. So, what happens is the people start feeling day term drowsiness; they have start having hypertension cardiac risk and all that.

So, if you have if you know somebody is having this problem it is very easy it is treatable by a simple machine call CPAP, continuous positive behavior pressure while you are sleeping just plug the machine put the mask on your nose sleep happily. It will take care all of this episodes of apnea and quality of life will change by hundred degrees. So, we will end this if there is anything you want to ask check anything. Circadian with them see there is no clock fitted in the head they are both cute; see the do not do not go away the word clock which we use.

So, this is a digital clock or that is an analog clock from CCM atom and all that clock which we use for our survival is different biological clock is the rhythm inside circadian rhythm is the circadian is from twenty four hours. So, there are other rhythms in the body also they may be a rhythm for a yearly rhythm, monthly rhythm menstrual cycle. So, biological clock will also control menstrual cycle there is some connection that it has to have a fourteen days and then.

So, there are lot of other things like you food digestion everything I mean it is this is not about just sleep; circadian has been set it is a frame of twenty four hours. Biologically, clock is a real rhythm circadian is twenty four hours; you can put forty eight hour rhythms look at six monthly rhythm whatever. So, that clock keeps working; obviously, there is a clock because otherwise we would not die. You should see a film end, time it watch it.