Basics of Mental Health & Clinical Psychiatry
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Lecture 21
Sleep Disorders

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Hello everyone. Let us start with lecture number 21, Sleep Disorders, what are the topics which we are covering what is sleep, classification of sleep disorders, insomnia, its treatment, parasomnias, hypersomnia and narcolepsy, circadian rhythm related disorders and sleep related breathing disorders.

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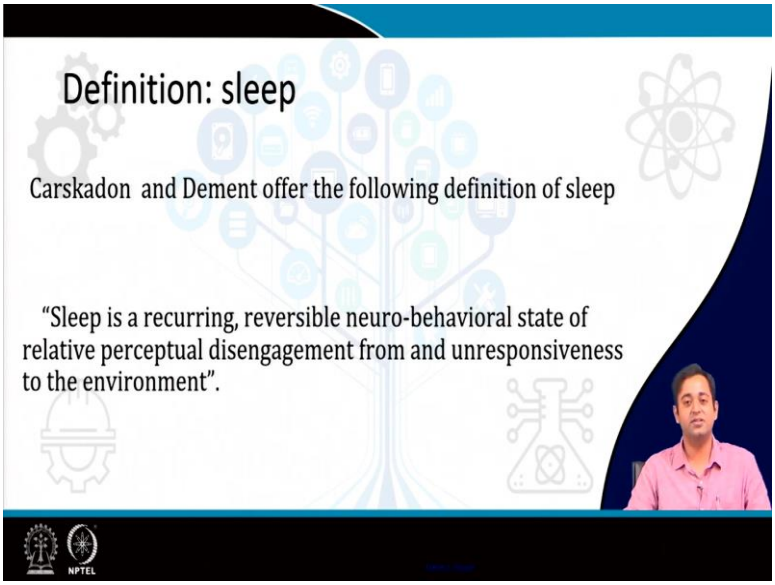

So, actually what is sleep? Sleep is a reoccurring reversible neuro-behavioral state of related perceptual disengagement from an unresponsiveness to the environment.

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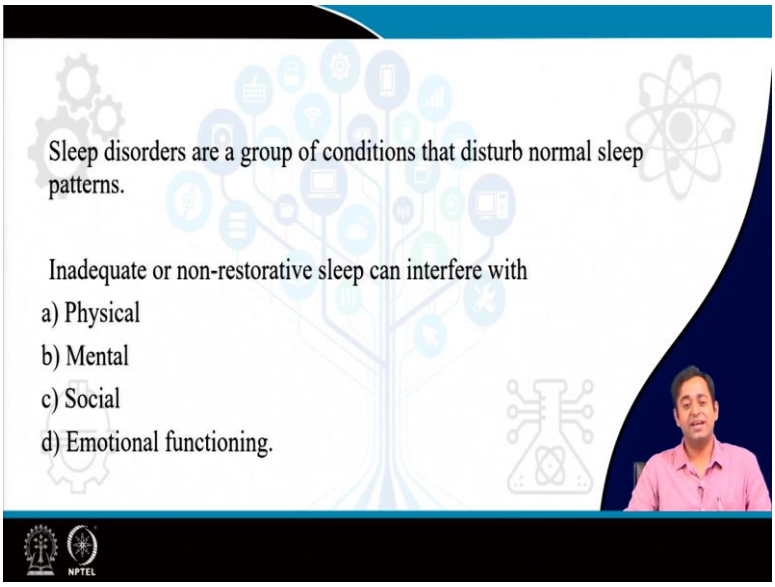

So, there are various conditions that actually disturb normal sleep patterns. And this inadequate or non-restorative sleep can interfere with the physical, mental, social and emotional functioning. Now, it is very commonly seen that when we are not having normal sleep, we actually get irritated, we are actually frustrated, we are not able to have normal functioning and a normal executive functions are actually impaired our attention, concentration, we actually sometimes becomes delirious also where we are losing the like the conscious part of our brain, they do not function properly, we are not able to relate ourselves

to the environment around ourselves. There is all sorts of things can happen when the patient is not having normal sleep.

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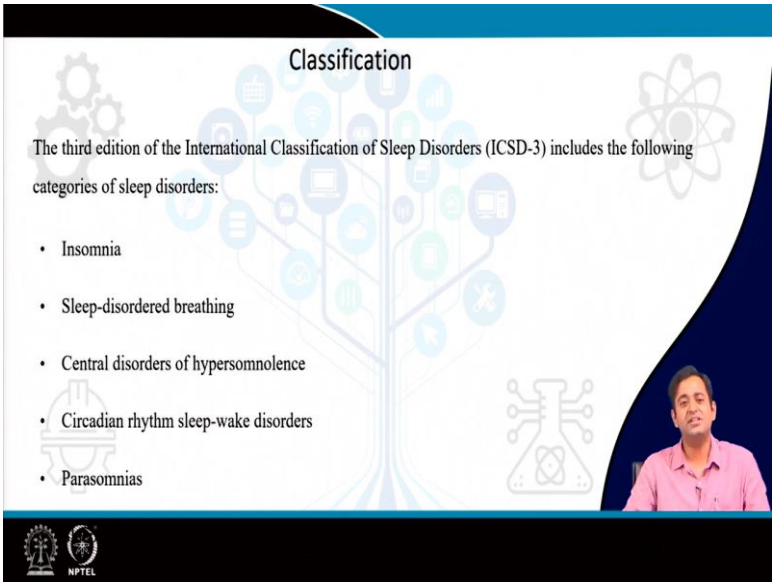

Now international classification of sleep disorders, has categorized the sleep disorders into Insomnia, sleep disordered breathing, the central disorders of hypersomnolence, circadian rhythm sleep-wake disorders and parasomnias.

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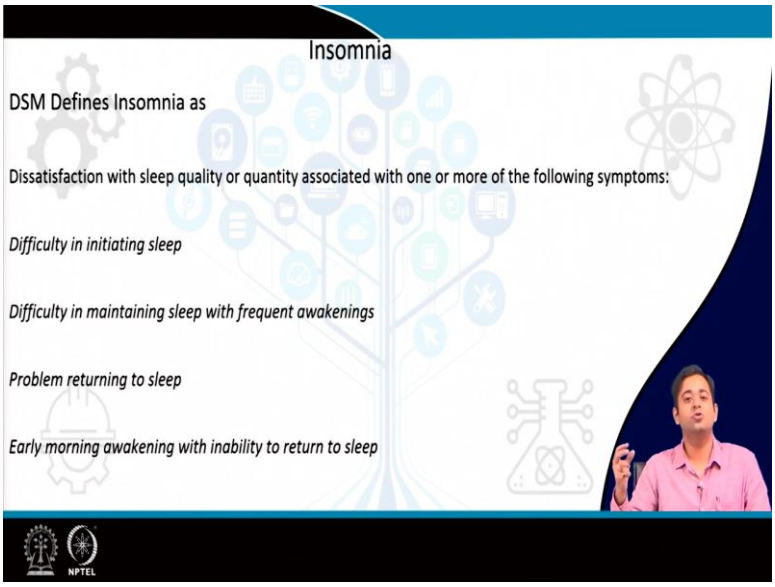

What is the insomnia? Insomnia is a dissatisfaction with sleep quality or quantity associated with one of the following symptoms. What are these? These are difficulty in initiating sleep, difficulty maintaining sleep and when you are not able to sleep at all, when there is problem

returning to sleep, like in some part of the like for most of us, when we wake up in the middle of the night, while going for a toilet or where you are not able to sleep properly and tries to go back to sleep there we actually find or we actually fails to sleep there. And there is early morning awakening also with inability to return to sleep. So, this can be the normal situations where the patient might be suffering from insomnia.

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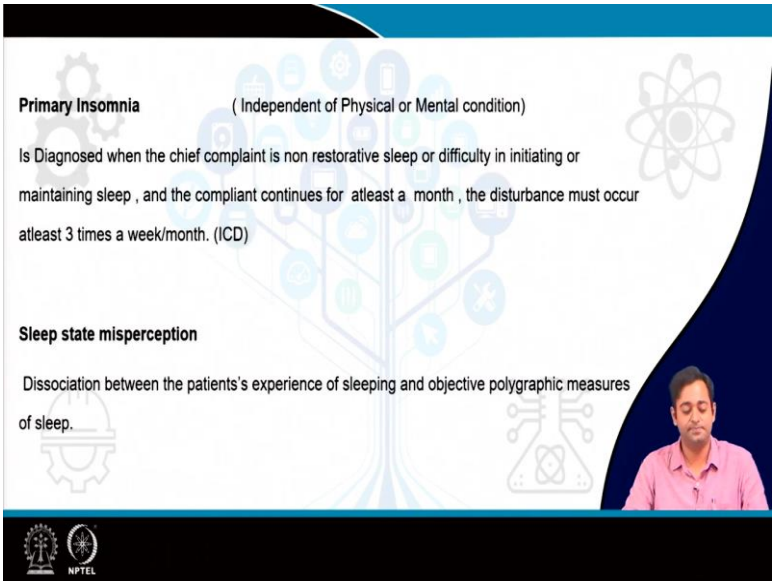

What is the primary insomnia? Primary insomnia is diagnosed when the chief complaint is not restorative sleep or difficulty in initiating or maintaining sleep and the complaint constitutes for at least a month and for 3 times a week. That is for every month for every week and 3 times a week you are having this period, this particular problem that is called primary insomnia.

Now what is sleep state misperception? When the person actually has a good sleep but the polygraphic patient has a good sleep but he is not able to accept the fact that he has actually slept well. Whereas and the polygraphic finding that is the assessment tool for which you assess the sleep is it gives the impression that the patient has actually slept well. So, there is a misperception with the sleep, the quality of sleep with the patient had last night.

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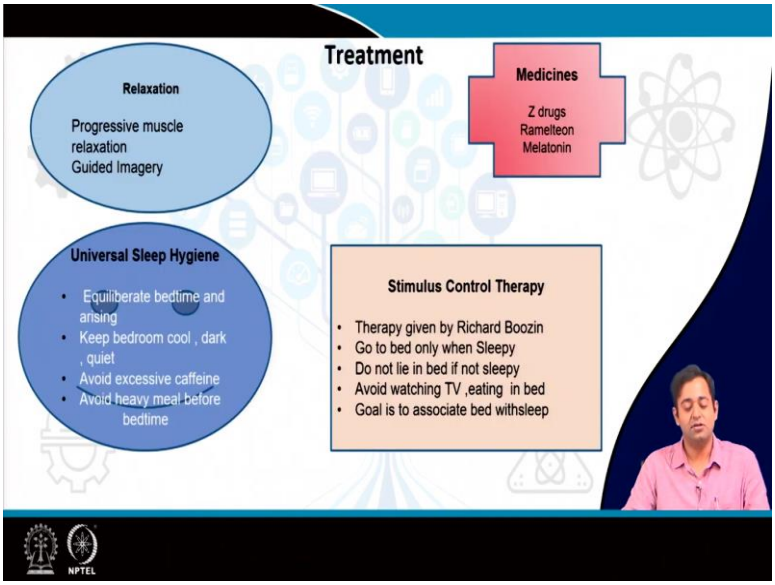

So, how can you treat this? So, the treatment is in a sequential pattern is given, the treatment is given in a sequential pattern. First, you actually go for universal sleep hygiene, wherein you are told to have your certain criteria that needs to be fulfilled for universal sleep hygiene. The bedtime should be proper for every day, there should be avoidance of excessive caffeine or alcohol or nicotine during the later part of the day in order to give you a better sleep wake schedule. You should equally believe it you are like a wake up time and going to bed. Then you have progressive muscle relaxation to be followed next while you are not having sleep.

Next is stimulus control therapies. Stimulus control therapies while you are going to sleep around the somewhere following your normal sleeping cycle. You should be avoiding your laptops, mobile, phones or TV so, the place where you are sleeping, it should be less stimulating in nature. And if all those things are not giving sufficient, like the relief is not for the person, he is not been dealing with all those kind of modalities of treatment, he is being tried with pharmacological medicines, that is, benzodiazepines, ramelteon and melatonin.

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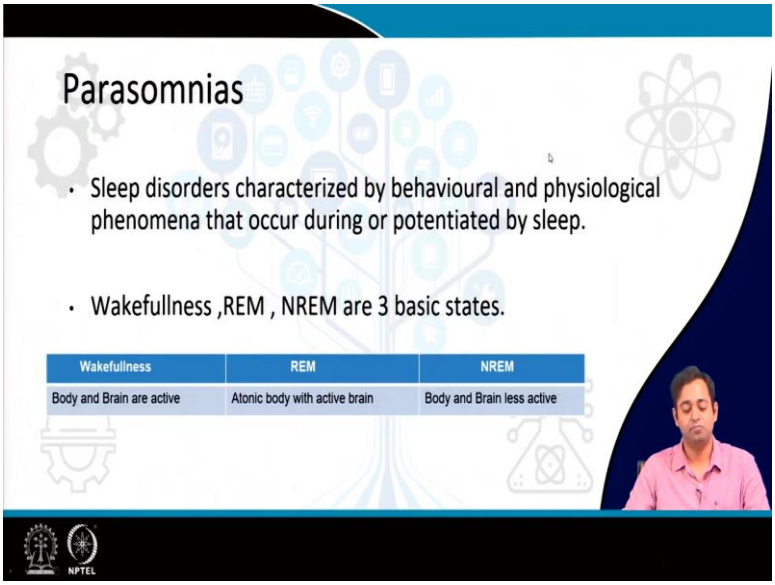

Now, what are parasomnias? Parasomnias are sleep disorders characterized by behavioral and physiological phenomena that occur during are potentiated by sleep. There are basically 3 basic states wakefulness where in the body and brain both is active, the REM phase of the sleep, the REM and NREM are the two phases of the sleep while we go to sleep, the NREM phase, the first, second, third and fourth stages, they are active and in a deep sleep after the post is over the REM states take over.

Now, in REM says, the muscular tone is lost while the brain is active and in an REM says the body and brain they are less actively involved.

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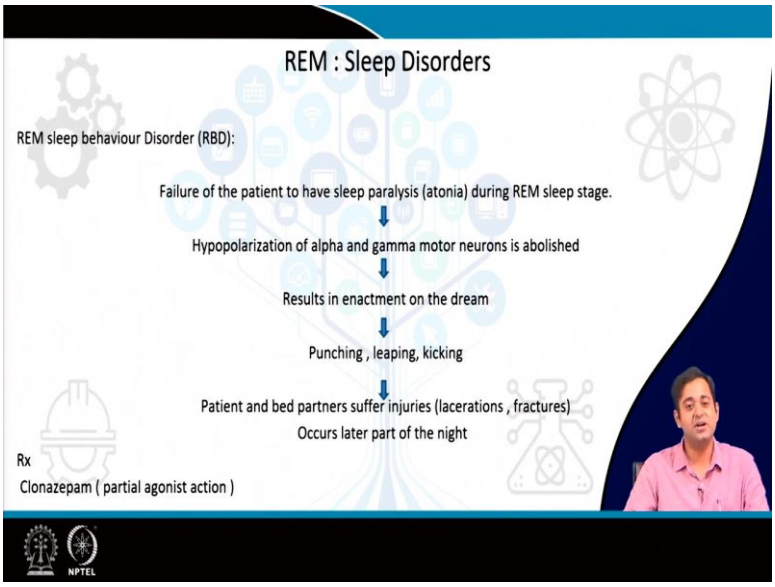

Now, what are these REM sleep disorders? In REM sleep behavior disorder, there is failure of the patient to have sleep paralysis. So, normally in REM there is atonia but here in REM, the REM sleep disorders there is failure to have the atonia during the REM phase, this gives rise to hypopolarization of the alpha and gamma motor neurons, which is abolished. Now normally, this alpha and gamma motor neurons is abolished but is decreased there is hyperpolarized but this hyper polarization does not occur, which results in enactment of the dream.

Now it is commonly portrayed in the television media or internet where the person is sleeping, and during and when he is in deep sleep and he is dreaming or she is dreaming, there might be some kicking action or trying to punching action. So, these all sorts of behaviors actually is commonly seen when the bed partners complained that they had suffering from some injuries that is lacerations and fractures whenever this patient is being sleeping beside their bed partners, which occurs during the later part of the night. And the treatment is clonazepam.

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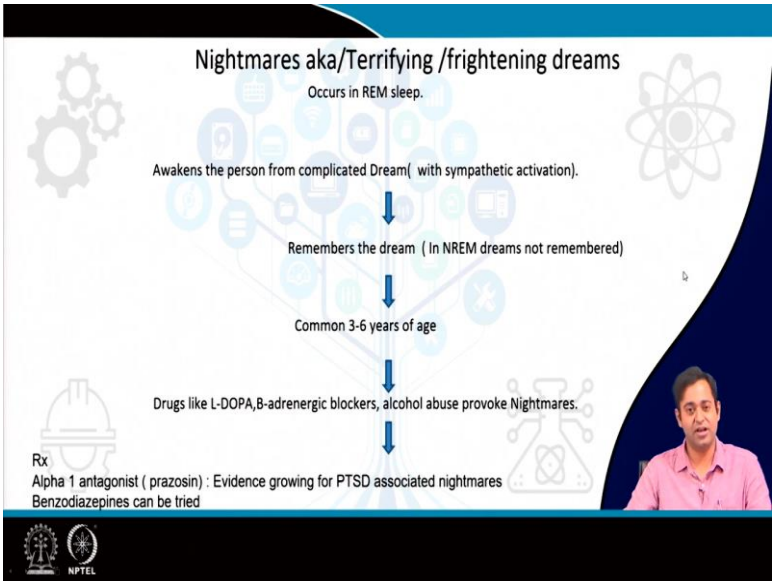

Now what are nightmares? Nightmares, they occur in the REM physical sleep. It awakens the person from the complicated dream with sympathetic inactivation. Sympathetic activation, there is perspiration sweating, as tachycardia (()) (7:46) your blood pressure drops. And one of the features which differentiates in REM from the REM is that in REM phase, your dreams are remembered where in NREM the dreams are not remembered. It is commonly seen in the age groups of 3 to 6 years and drugs like the levodopa, B-adrenergics, alcohol abuse, they

actually provokes the nightmares. That treatment is also alpha 1 antagonist that is prazosin and benzodiazepines can also be tried.

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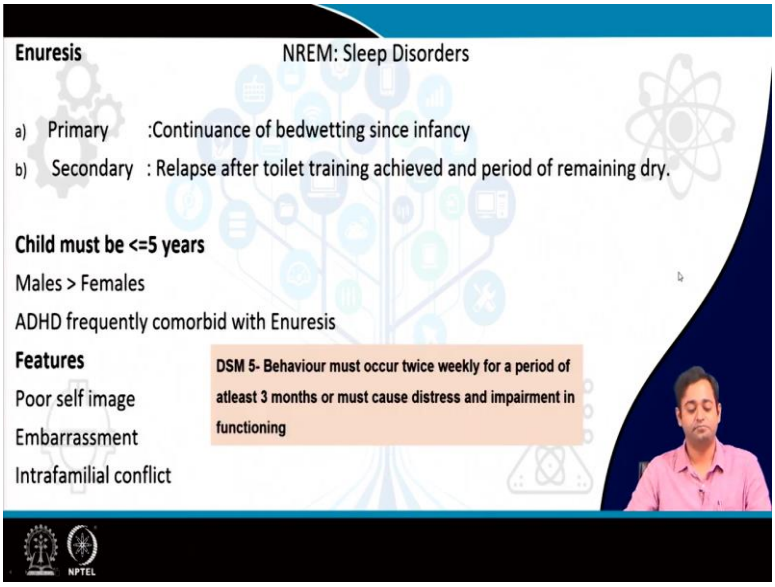

What are the NREM sleep phase disorders? First is enuresis. Now enuresis is of two types primary and secondary. Primary is when the patient is the person the child it continues to have bedwetting from its infancy and he has not attained the toilet training. Now, what is secondary enuresis? It is occurring when there is a relapse of this bedwetting behavior after the child has attained the toilet training. What is the minimum age of the child that should be present? It should be must be of 5 years. It is commonly seen in males and ADHD and that is hyper Attention Deficit Hyperactive Disorder is commonly seen with the infants which who are having a neurosis.

What are the features? There is poor self-image there is embarrassment and there is inter parental conflict. The parents they always criticize their child, there is sometimes at times physical abuse also. So, that gives rise to parent child or inter parental conflict. Now behavior must occur this duration this enuresis is this must occur twice weekly for a period of at least 3 months or must cause distress and impairment in the functioning of the child.

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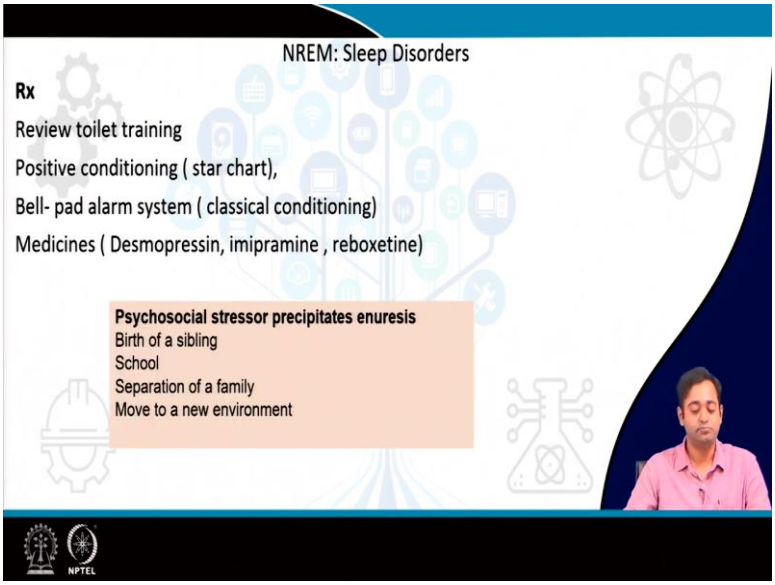

The treatment is we have to review with the proper toilet training has been given. Positive conditioning is by the star charts. Positive is condition is when the reward is given, the child is being told that okay, if you do not wet your bed today you will be given some reward, you will be given stars, you will be given some kind of chocolates, you will be taken to a place where you like to go. So, this is a kind of positive reinforcement.

And then you have classical conditioning, classical conditioning that is that if the previous two modalities they do not work, the child is being wrapped up with a pad and a bell alarm which actually gives a signal wherever there is an episode where the child needs to mature that can go for urination at the middle of the night. So, there is an alarm which goes and wakes up the child and he is being asked to go and get it in the toilet.

So, if these 3 modalities does not give rise to relevance of the, if it does not relieve the symptoms of bedwetting, that is enuresis, the pharmacological management is being tried in the form of desmopressin, imipramine, reboxetine. Now, there are various psychological stresses, but of a sibling or going to a new school separation from the family well, these can precipitate enuresis.

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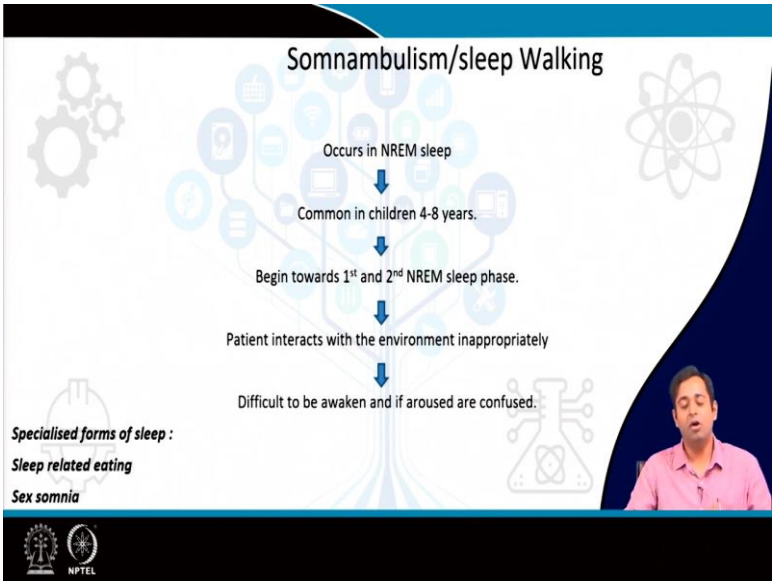

Now, what is sleepwalking, somnambulism? We have all seen in his our movies or cartoons where the character is actually walking during his sleep, it is occurring in the NREM phase most commonly seen in children with 4 to 8 years of age begins first and second part of the NREM phase of the sleep and there is one peculiarity which is found out during this somnambulism is that patient tries to communicate with the environment but it is done in appropriately there is difficult to be awakened the patient if tried to arouse they are confused, specialized forms of sleeps are sleep related eating and sex somnia.

Now, there are conditions where the patient might be in sleep and they are actually eating. These actually, these occurs also in NREM phase and there are some episodes of sexual act which is being performed when the patient is under NREM phase of sleep, it is called sex somnia. And when next day when the patient wakes up, he actually altogether forgets about the incident what has occurred.

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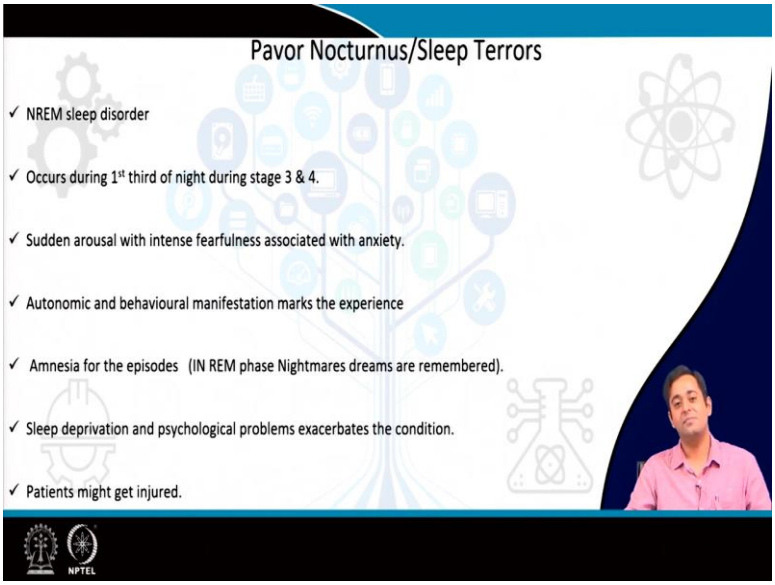

So, what is power nocturnus, sleep terahertz. It is NREM phase disorder. It occurs during first third of night. And during the stage 3 and stage 4, there is sudden arousal with intense fearfulness associated with the anxiety. There is a romek and behavioral manifestations that autonomy can be able manifestation means patients might be suffering from sweating, they can be tachycardia, they can be partially giddiness, they can be agitated or at times confused. And there is amnesia for the episode, patient actually forgets about the situation the experience which the patient has suffered. It can happen due to sleep deprivation and psychological problems. And yes, there patient might get injured themselves.

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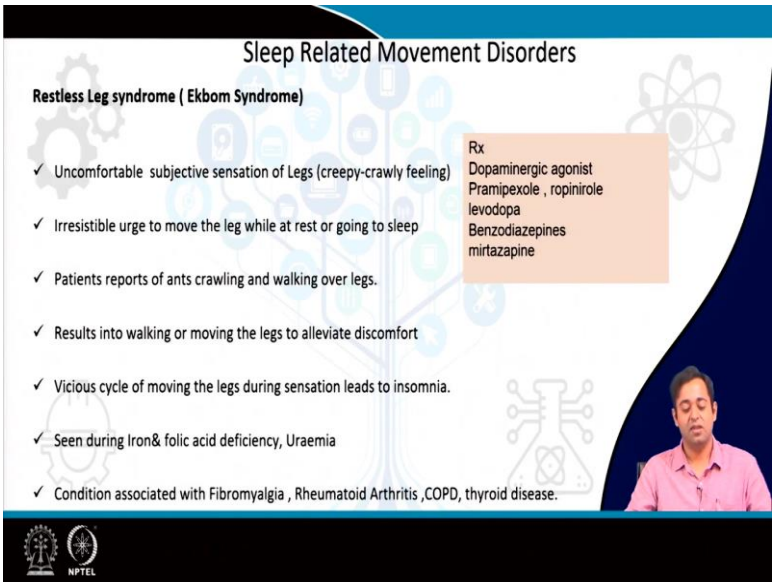

What are sleep related movement disorders? Restless leg syndrome, restless leg syndrome most commonly is when the patient comes with, who are suffering from restless leg syndrome. The most common complaint is that I have some itching sensation some ants crawling over my legs whenever I try to go to sleep. So, it does not happen during your daytime when you are walking when you are actually awake. So, whenever the patient tries to go to sleep or he is in a relaxed state, there is this kind of sensation, creepy-crawling kind of sensation, which the patient complains of.

Now, that is why it creates a sort of vicious cycle. So, at night when the patient is going to sleep this kind of sensation starts. Patient has to moves leg to avoid those kind of sensation or ignore those kind of sincere sensation which actually breaks their sleep and or sometimes it the intensity so much so that patient has to walk. So, this vicious cycle continues and it gives rise to agonizing pain. So, this condition is associated with folic acid and iron deficiency and the treatment is dopaminergic agent that is Pramipexole and (()) (14:39). Sometimes benzodiazepine mirtazapine are also tried for the benefit of the patient.

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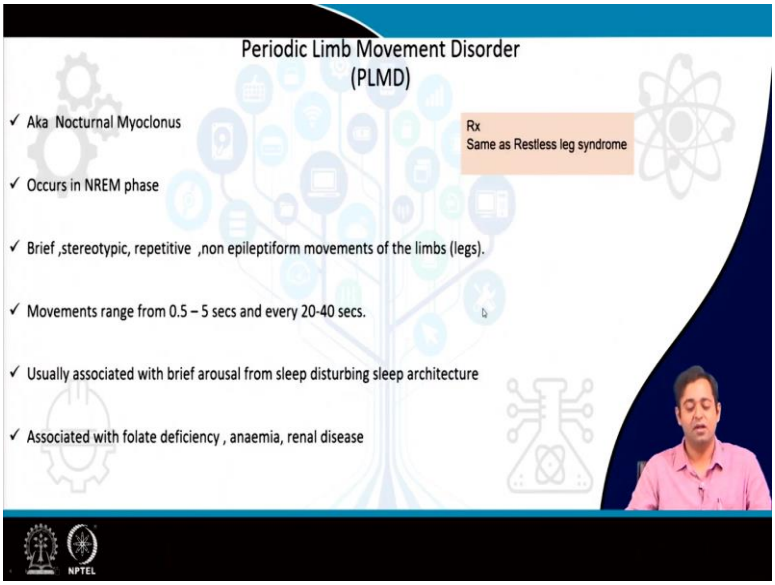

What are periodically movement disorders? They are also known as nocturnal myoclonus. It occurs in NREM phase of the sleep. It is a brief, stereotypic, repetitive and non-epileptic movements of the libs. Movement range is between 0.5 to 5 seconds and every point 20 to 40 seconds it happens. It is usually associated with brief arousal from sleep, disturbing sleep architectures associated with folate and anemia, anemic deficiency states like restless leg syndrome, and the treatment is actually the same as restless leg syndrome.

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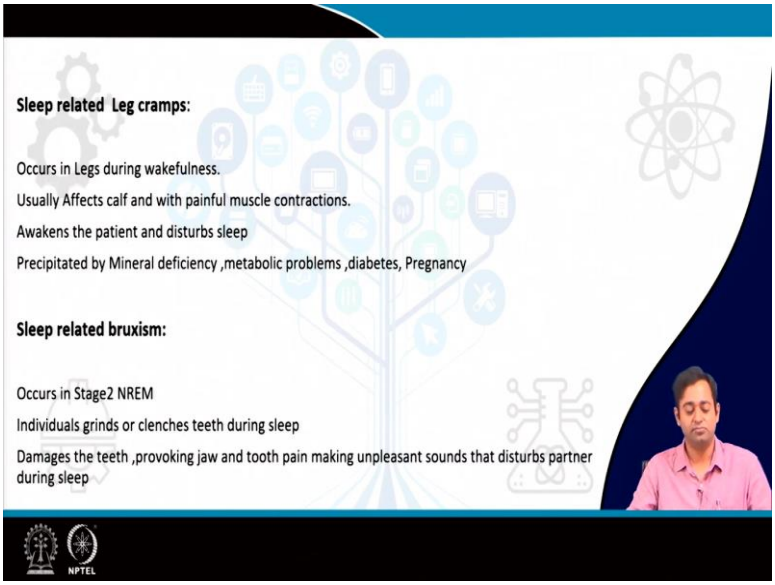

What is sleep related leg cramps? They occur in legs during wakefulness when the patient is awake, usually affects calf muscles and when they are associated with painful, painful muscle contractions, it awakens the patient and disturb the sleep. It is precipitated by mineral deficiency metabolic problems, diabetes and pregnancy.

Now what is the sleep related bruxism? It is occurring in stage two of the NREM phase of the sleep. The individual who is suffering from this is actually grinding his teeth or clenching his teeth during the sleep. It damages the teeth and provoking jaw and tooth pain, which makes unpleasant sounds that disturb the partner during the sleep.

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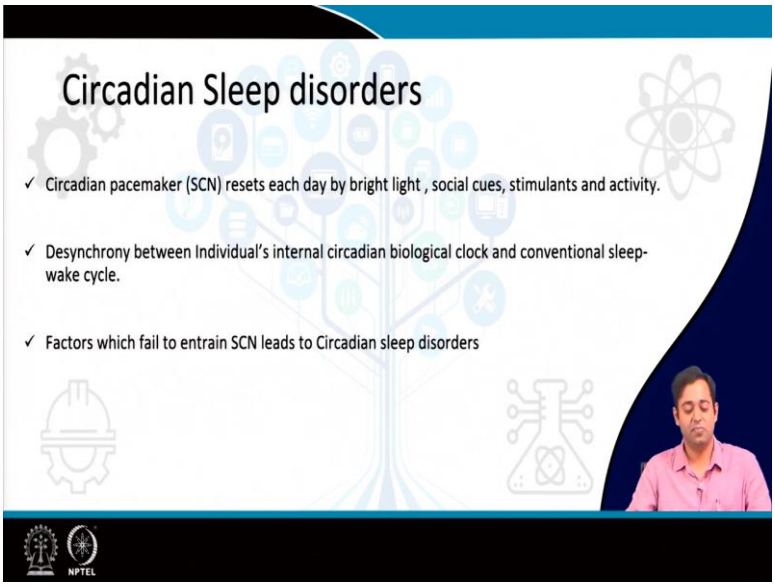

What are circadian sleep rhythm disorders? Circadian sleep rhythm disorders they are mostly governed by the suprachiasmatic nucleus which actually is the pacemaker which governs this day light piece of the sleep. There is desynchrony, how does it happen? There is desynchrony between the individual's internal circadian biological clock and the conventional sleep wake cycle. A factors which failed to entrain this suprachiasmatic nucleus to the which gives rise to circadian sleep disorders.

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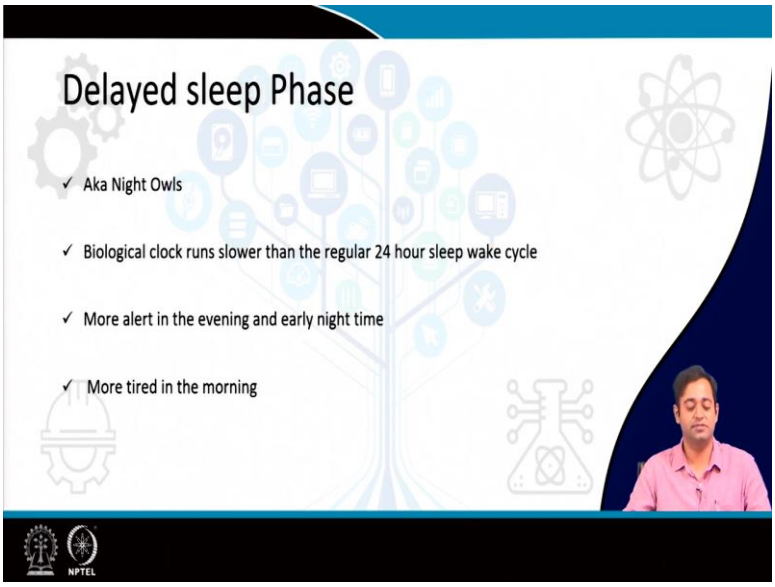

What are sleep delayed phase and sleep advanced phase? Sleep delayed phase it is mostly seen in night owls. Biological clock turns slower than the regular 24 hours sleep wake cycle, they are more these persons they are more allowed in the evening and the early nighttime more tired during the morning, it is mostly seen for the students or those who are working for deadline works, they have to finish their work in a stipulated period of time. So, they had to work throughout the night. So, these are most commonly seen in those kinds of persons.

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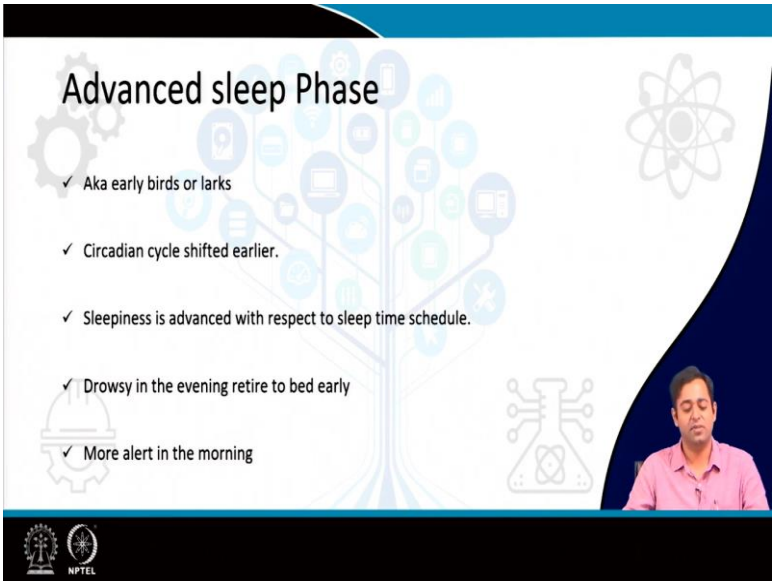

Now, what is advanced sleep phase? Advanced sleep phase is actually the reverse of the delayed sleep, it is commonly seen in case of old age persons where they actually sleep very early somewhere around 7:30 to 8:30 and wake up early some around 3 to 4 that is why they are called early birds. Sleepiness is advanced with respect to sleep time schedule, they are drowsy in the evening and they try to retire to the bed early and likewise they are getting up early in the morning.

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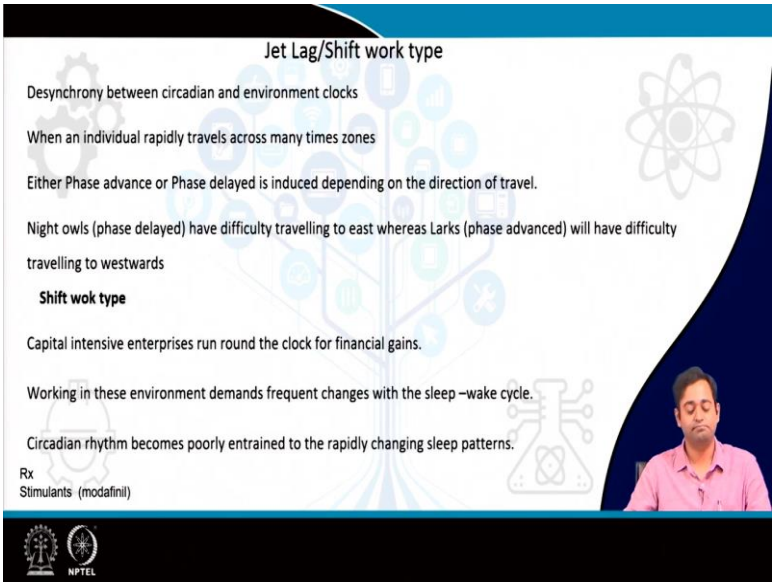

Now, what is the jet lag and shift work type problems associated with the circadian rhythm. There is discrepancy between the circadian and environmental clocks as we all know, what happens is when an individual rappelled travels across time zones, either phase advance or

phase delay it is inducing depending upon the direction of the travel. Now phase delayed who are called the night owls have difficulty traveling towards east whereas the Larks who are phased advanced types will have difficulty traveling towards west.

So, it is very like obvious try to analyze this. So, if you are an early riser and if you are traveling towards like west that can have problems and if you are suffering from delayed sleep patterns, then you will have difficulty travel towards the east because you might have to wake up early and for you it is not possible because you have slept very late part of in the later part of the night. What happens in shift work type of problems? These are actually occurring in the industrial areas where there is capital intensive enterprises they actually organize this kind of work pattern or the work schedule where the factory works, they are running where the factory is running 24 hours and you have shift basis recruitment of the workers.

Now those workers who are running for morning shift and in 2 to 3 days they have to eventually go back to the night shift. The problem starts or arises for these kind of situations. Now for treatment for this kind of problem is stimulants or the drugs which actually makes their circadian rhythm which is desynchronized into proper synchronization.

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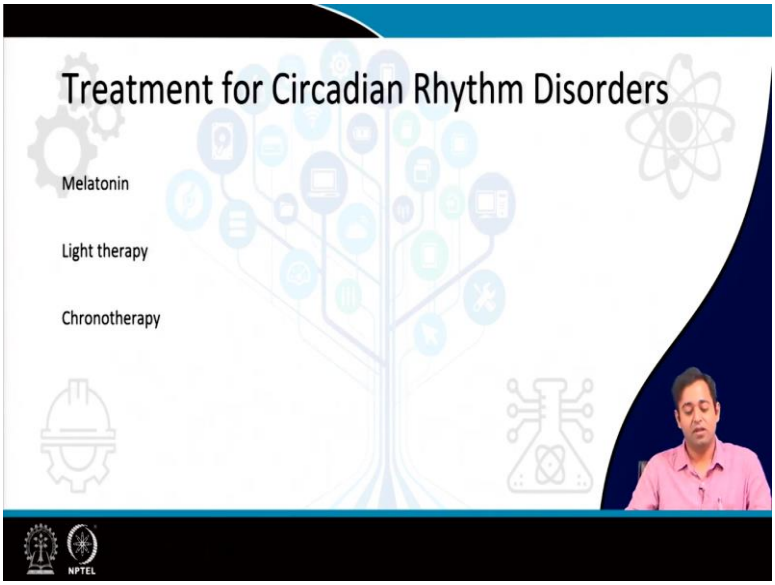

What are the treatment for circadian rhythm disorders? It is melatonin, light therapy and chronotherapy.

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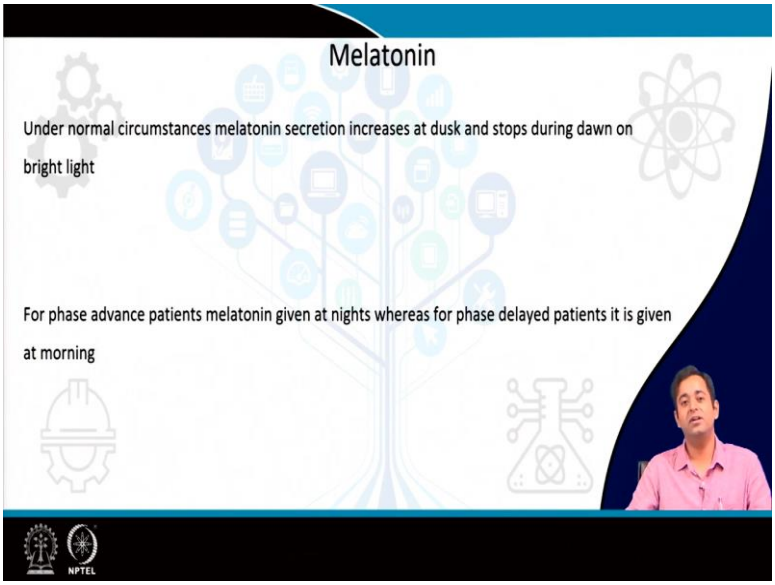

Now how is melatonin given? Melatonin is normally secreted during the evening at a time of dusk and it stops during the dawn when there is a bright light. So, the secretion of melatonin stops during the morning and it starts in the evening. For a phase advanced patients, melatonin given at night, whereas for phase delayed patient, it is given at morning.

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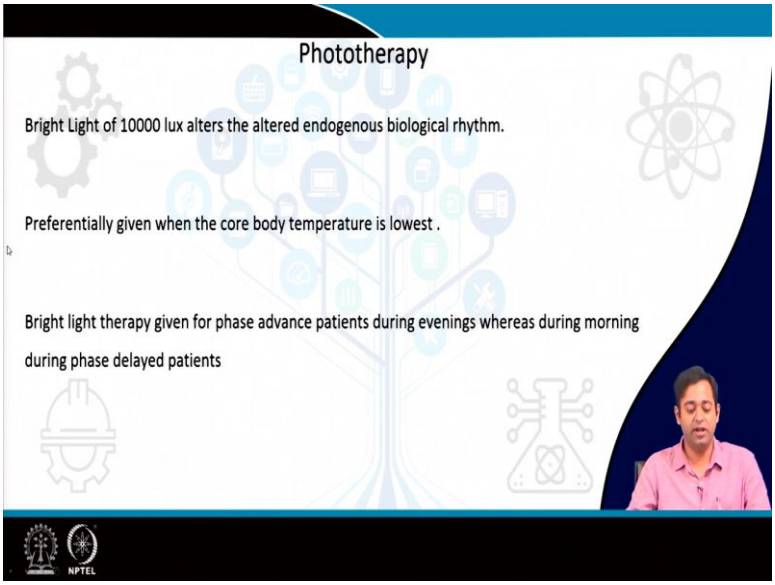

Phototherapy is when the bright light of 10,000 lux is given for distance from a distance of 25 centimeters. Preferentially when the core body temperature is lowest. So, bright light therapy for advanced phase of the patient is given during the evening whereas during morning for the delayed patient, it is given in the morning time.

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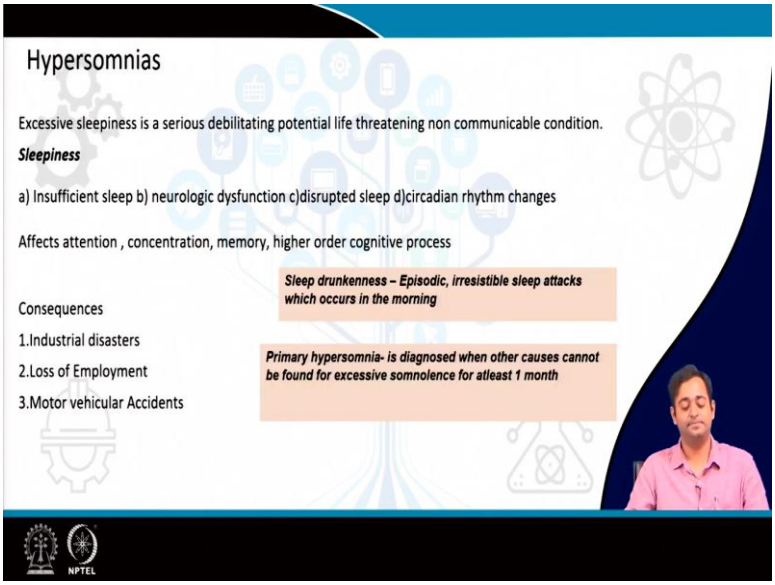

So, what are we hypersomnias? Hypersomnias is excessive sleepiness and the conditions which actually cause this is insufficient sleep, neurological dysfunction, disrupted sleep phases or circadian rhythm changes. These can all culminate into attention problems, concentration, memory and higher order cognitive processes. What are the consequences? It can lead to industrial disasters if you are working in industrial sector, loss of employment because you have actually suffered and motor vehicle accidents if you are driving and you are suffering from hypothermia, you might have accident.

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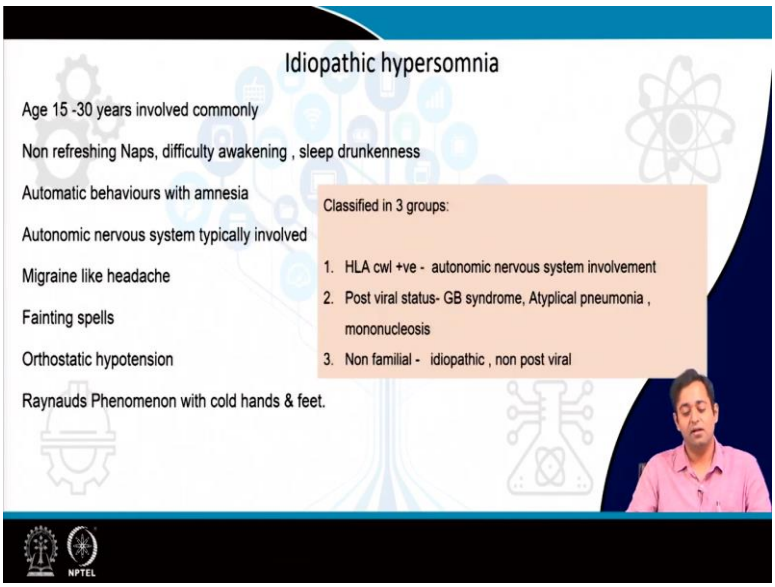

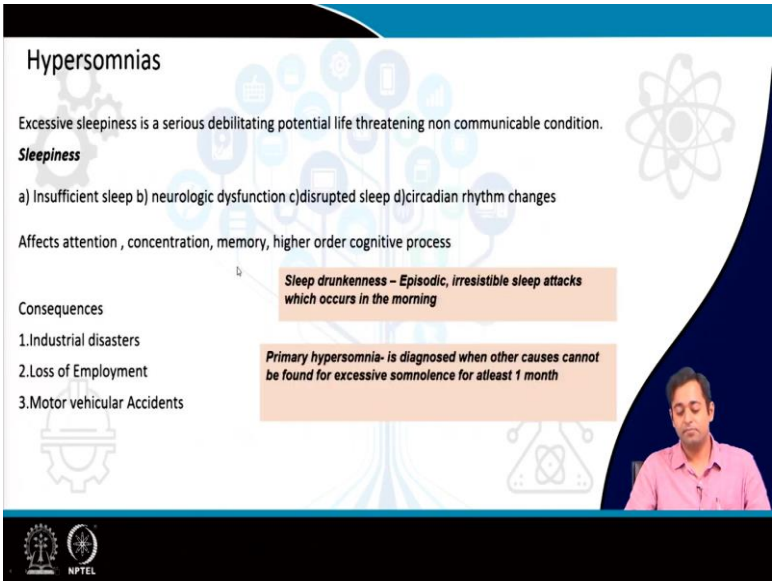

What is idiopathic hypersomnia? It is usually seen in 15 to 30 years of age group, non-refreshing naps, which is difficult to awaken the patient, sleep drunkenness is where you have episodic irresistible sleep attacks which occur in the morning. And primary hypersomnia is diagnosed when other causes cannot be found for excessive somnolence for at least one month. So, when the other causes of hypersomnia is not found for a period of at least one month, this is known as primer hypersomnia.

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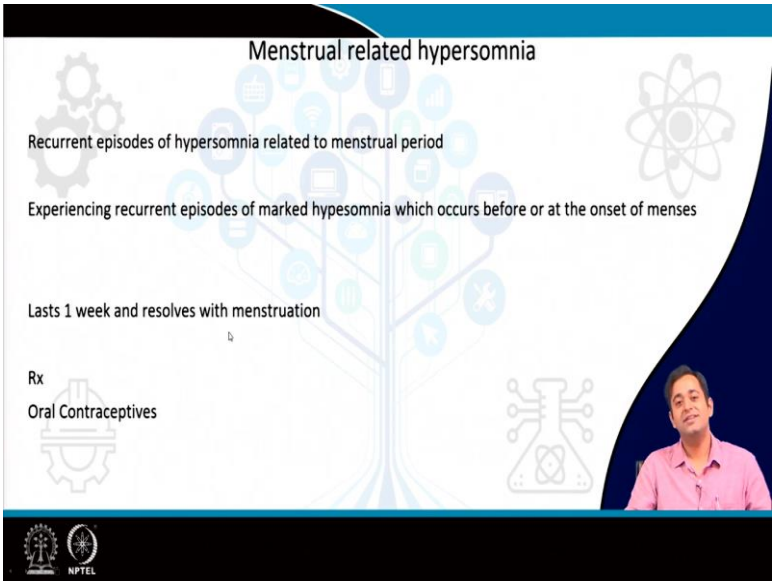

Now there is hypersomnia associated with the menstrual cycle, wherein it is experienced as a recurrent episodes of marked hypothermia, which occurs before at the onset of menses and it lasts for one week and it resolves with the menstruation. It is treated with oral contraceptives.

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Now what is a Klein Levin syndrome? Klein Levin syndrome is where there is recurrent periods of prolonged sleep with intervening periods of normal sleep and awakening, like alert and working phase. And during the hypersomnia phase, the wakefulness periods are usually marked by withdrawal from social contacts with return to bed, commonly seen in case of males, it is recurrent. There is recurrent episodes with extensive sleepiness, voracious appetite is there. There is hyper sexual behavior, disinhibiting behavior, and this particular episode, its last for days to week will 1 to 10 times per year.

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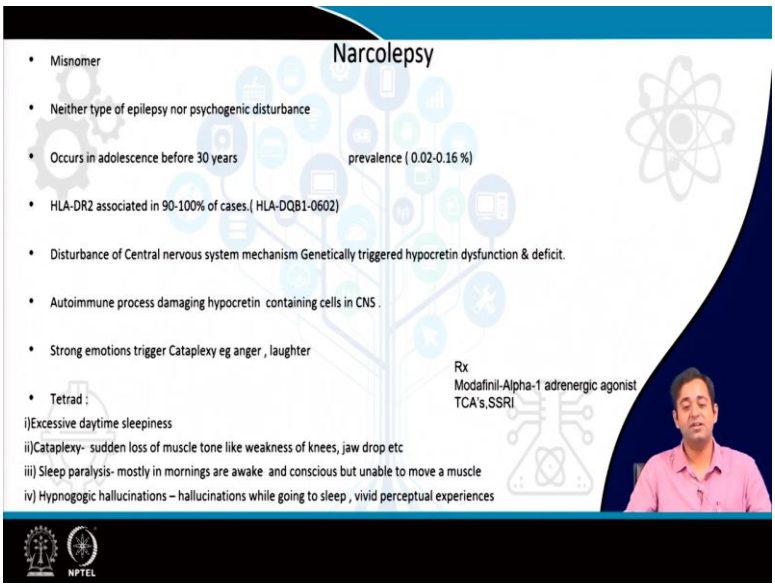

Now what is narcolepsy? As the name suggests, it is a misnomer. It is neither an epilepsy nor a psychogenic disturbance. It is occurring before 30 years of age and it is most common due

to the auto immune involvement, which leads to hypo creating dysfunction. There are basically four common characteristic features known as a tetrad. So, tetrad is excessive daytime sleepiness. The second is cataplexy there is sudden loss of the muscle tone.

Third is sleep paralysis. That is mostly seen in the mornings when the patients are awake and conscious but are unable to move their muscle and the last is hypnagogic hallucinations where is the hallucination is experienced when the patient tries to go to sleep. Treatment is with the help of alpha adrenergic agonist that is Modafinil or at times tri cycle (()) (24:04) depressants or selective serotonin reuptake inhibitors can be tried.

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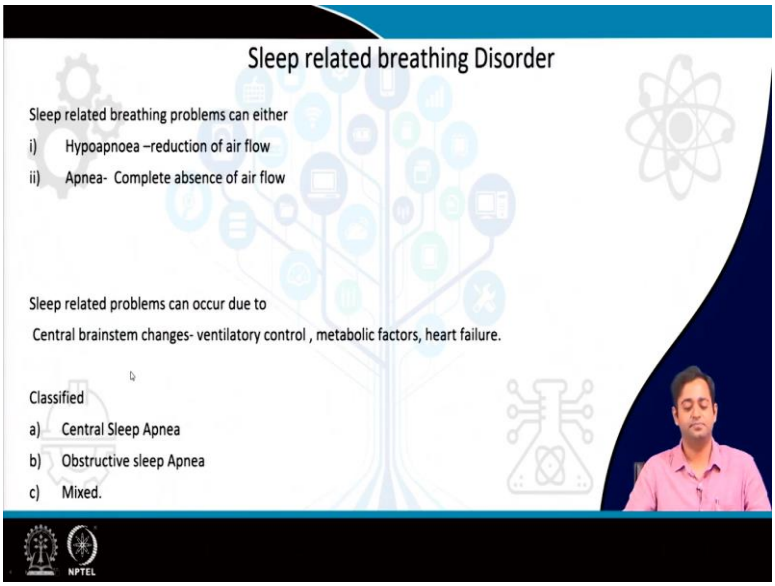

What is sleep related breathing disorders. they are basically of two types that is obstructive sleep apnea and central sleep apnea. For obstructive sleep apnea you have hypo apnea so, hypopnea is when we will have reduction of airflow. For central sleep apnea you have complete absence of airflow there is apnea.

So, sleep related problems they can occur due to ventilatory control, loss of ventilatory control that is inspiratory and expiratory changes, various metabolic factors and heart failure, metabolic factors means you have various hormonal changes, or (()) (24:44) anemias. Now (()) (24:47) anemias is one of the most important factors which can give rise to sleep related breathing because all of our channels are either ligand gated or ion supported channels in our body which functions properly or they act in synchrony to maintain the internal homeostasis of the body.

How heart failure can give rise to sleep related breathing disorder, this they can give us two respiratory failure, type one and type two, which can complicate the situation.

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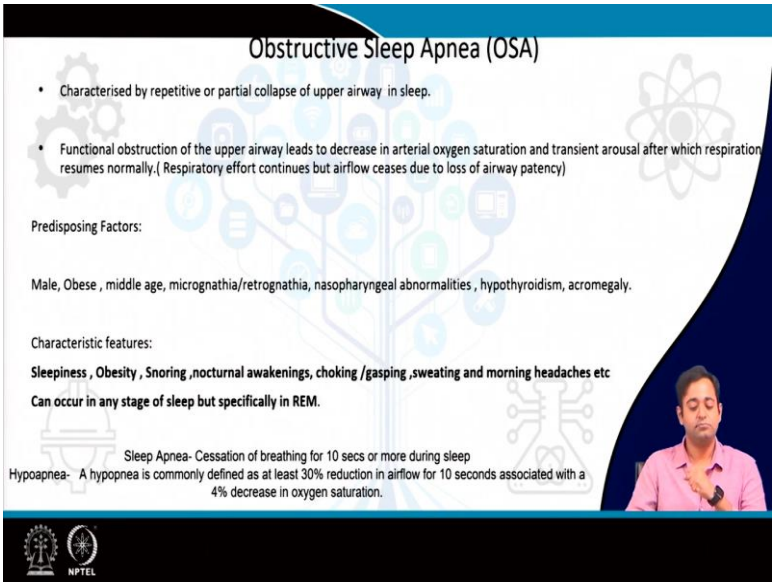

Now what is going on obstructive sleep apnea? Obstructive sleep apnea is characterized by repetitive or partial collapse of upper airways when you are in sleep. There is functional obstruction of the upper airway leads to decrease in the arterial oxygen saturation, transient arousal or which respiration is after which respiration resumed normally.

Now the difference the clinching point between central sleep apnea and obstructive sleep apnea is in obstructive sleep apnea you have a respiratory continues respiratory effort the patient actually tries to breathe whereas in central sleep apnea, there is complete cessation of breathing. There is no trial for the on the part of patient who wants to breathe. So, this apnea sudden loss physician of the pathway.

So, what are the predisposing factors which actually give rise to obstructive sleep apnea? Males in case of males who are obese who are having overweight, middle aged group whose mandible shapes and sizes that is micrognathia or retrognathia are present in nasal pharyngeal abnormalities, various structural abnormalities associated with the person. (()) (26:35) related issues that has hypothyroidism and at times acromegaly also because acromegaly you have large nose, (()) (26:41) this all gives rise to obstructive apnea.

What are the characteristic features? Sleepiness the patient might be suffering from sleepiness, obesity, there is nocturnal awakenings at night, because whenever this airway patency is decreased, there is this drive for the patient to give inspiratory effort and this

occurs when there is a vicious cycle is actually originated where the patient is tries to patient tries to be there is increasing the CO2 levels there is decreasing the oxygen saturation levels and there is sweating morning headaches can occur in any stage of the sleep. But most commonly it is the REM physical sleep.

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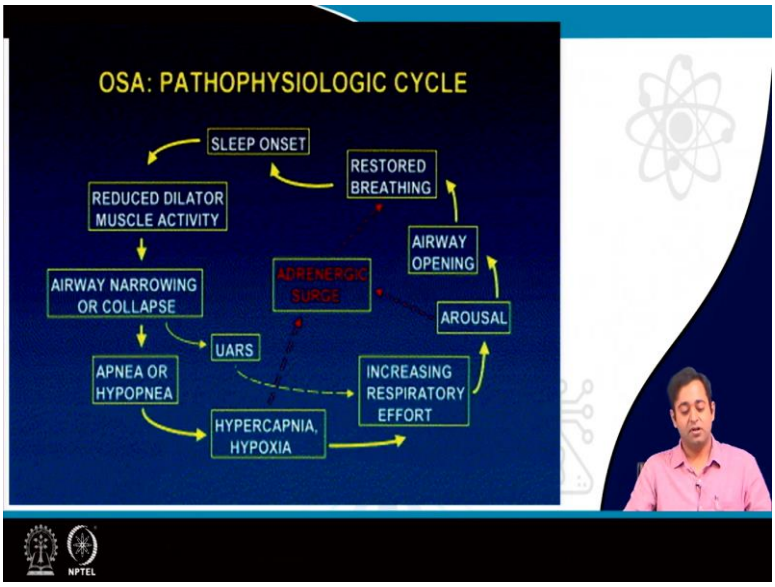

As I was telling it occurs as a vicious cycle. It is in sleep onset there is reduced dilator muscle activity which leads to airway collapse or narrowing of the airways, apnea or hypo apnea occurs give rise to hypercapnia where the CO2 concentration is increased and the hypoxia oxygen saturation level is decreasing, then the patient tries to be actively there is inspiratory effort which arouses the patient from sleep, there is sweating there is at times confusion. So, this actually increases the airway which opens the airway and the breathing is restored.

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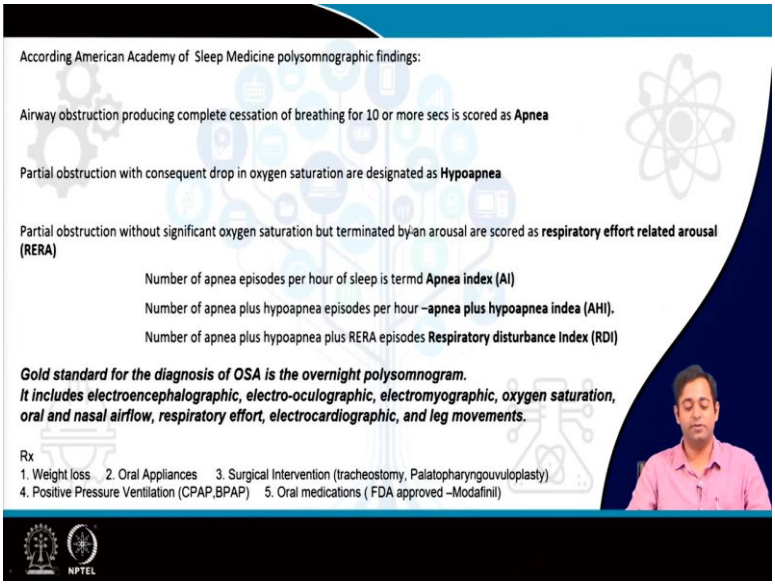

According to American Academy of Sleep Medicine, follow up your findings. There are certain parameters which is required. Partial obstruction without significant oxygen saturation but with terminated but terminated by an arousal are scored as respiratory effort related arousal (()) (28:33), so a number of apneic episodes per hour of sleep apnea index. Number of apnea plus hypercapnia episode per hour apnea plus hypopnea index, number of apnea plus hyperthermia plus respiratory effort related arousal is respiratory disturbed index. So, there is one instrument that is called the polysomnography instrument which is the gold standard for diagnosing the obstructive sleep apnea.

So, what it assesses? It assesses the electroencephalographic, oculographic, myographic, oxygen saturation levels, respiratory effort, electrographic and the leg movements. So, how can we treat this condition? First we weight loss regimen is tried, the weight loss regimen does not relieve the symptoms. Oral appliances specific mandible appliances are tried to decrease the symptomatology of the pain of the obstructive sleep apnea. If these two are not given enough for relief of the symptoms the patient is patient goes on to for the surgical intervention that is palatopharyngouvuloplasty or tracheostomy.

If all those modalities are tried and there is no symptom removal, the positive pressure ventilation that is BPAP and continuous and well by level both can be given. And lastly, oral medications are trialed. In oral medication FDA approved is only Modafinil.

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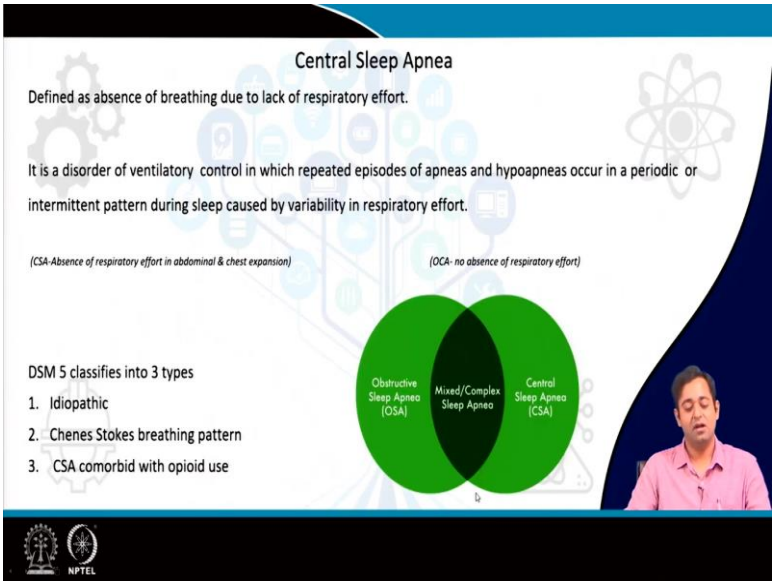

So, what happens in central sleep apnea? As you can see, in obstructive you have decreased breathing and here you have complete lack of respiratory effort. It is a disorder of ventilator control in which the repeated episodes of apnea and hypo apneas occur in a periodic or intermittent pattern of during sleep caused by variability in respiratory effort. So, there is absence of respiratory effort or abdominal chest expansion in central sleep apnea, whereas in obstructive sleep apnea, there is no absence of respiratory effort that is patient actually tries to breathe.

Basically divided into 3 types that is idiopathic cheyne-stroke breathing and due to opioid overdependence.

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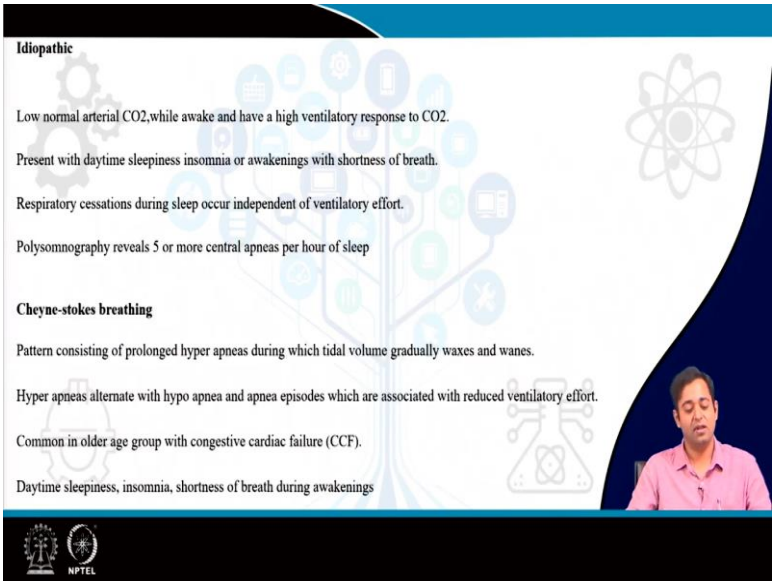

What is idiopathic? Idiopathic type is when there is low normal arterial oxygen saturation while the patient is awake and have a high ventilated response to carbon dioxide. Patient presents with daytime sleepiness, insomnia or awakenings with shortness of breath, there is respiratory cessation during sleep, which is independent of ventilator effort and polysomnography reveals 5 or more central apneas per hour of sleep.

Now, what happens to cheyne-stroke breathing? Here the pattern is consisting of prolonged hyper apnea in which the tidal volume, gradually waxes and wanes, so, it provided decreases and increases. So, hyper apneas they alternate with hyper apnea and apneic episodes which are associated with reduced ventilatory effort. It is commonly seen in older age groups with congestive cardiac failure. It is seen as a daytime sleepiness, insomnia, shortness of breath during awakenings.

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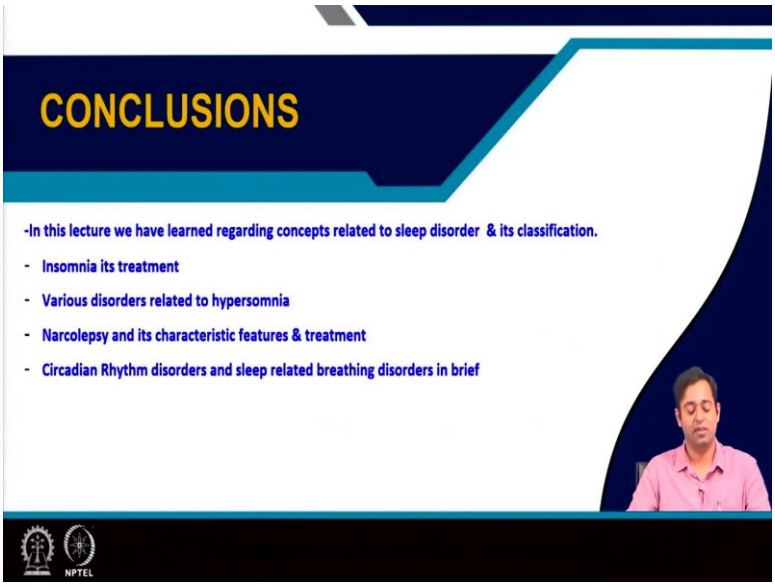

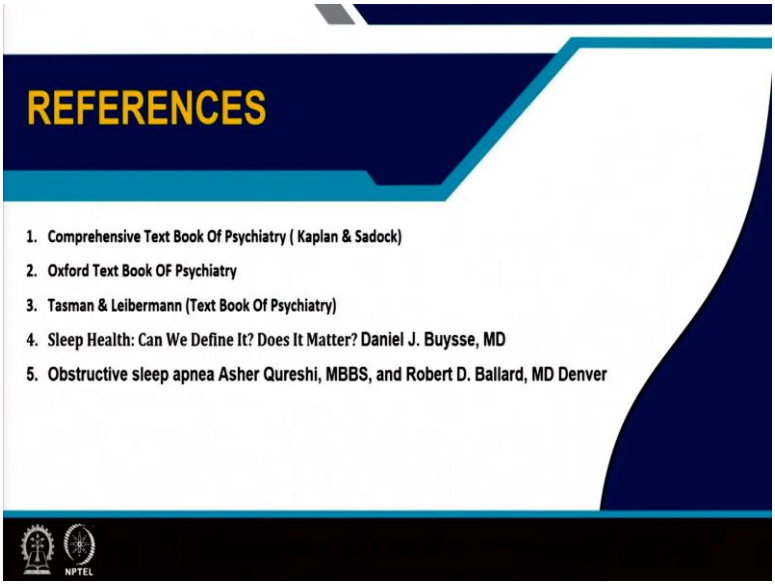

So, in this lecture, we have learned regarding concepts related to sleep disorder, its classification, insomnia, its treatment, various disorder related to hypersomnia, narcolepsy and circadian rhythm and sleep related disorders. Thank you.