



NPTEL ONLINE CERTIFICATION COURSES

Course Name

Mental Health & Basics of Clinical Psychiatry

Faculty Name

Dr Sumit Kumar

Department Name

Psychiatry

TATA MAIN HOSPITAL

Lecture 21 : Sleep Disorders

Topics Covered

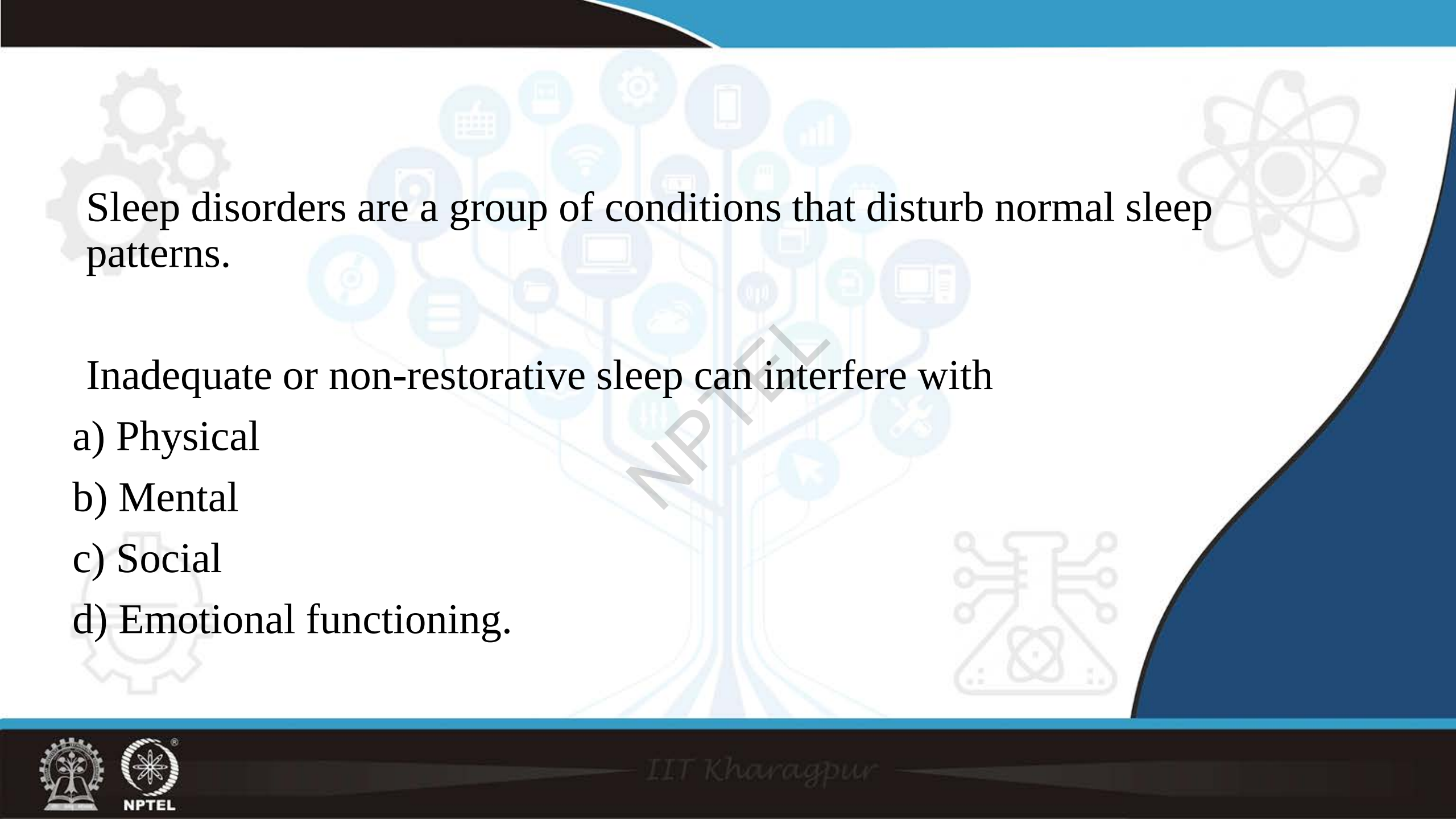
1. What is Sleep
2. Classification Of Sleep Disorders
3. Insomnia & Its treatment
4. Parasomnias
5. Hypersomnia & Narcolepsy
- 6 . Circadian Rhythm related disorder
7. Sleep related breathing disorders

Sleep Disorders

Definition: sleep

Carskadon and Dement offer the following definition of sleep

“Sleep is a recurring, reversible neuro-behavioral state of relative perceptual disengagement from and unresponsiveness to the environment”.



Sleep disorders are a group of conditions that disturb normal sleep patterns.

Inadequate or non-restorative sleep can interfere with

- a) Physical
- b) Mental
- c) Social
- d) Emotional functioning.

Classification

The third edition of the International Classification of Sleep Disorders (ICSD-3) includes the following categories of sleep disorders:

- Insomnia
- Sleep-disordered breathing
- Central disorders of hypersomnolence
- Circadian rhythm sleep-wake disorders
- Parasomnias



Insomnia

DSM Defines Insomnia as

Dissatisfaction with sleep quality or quantity associated with one or more of the following symptoms:

Difficulty in initiating sleep

Difficulty in maintaining sleep with frequent awakenings

Problem returning to sleep

Early morning awakening with inability to return to sleep

Primary Insomnia

(Independent of Physical or Mental condition)

Is Diagnosed when the chief complaint is non restorative sleep or difficulty in initiating or maintaining sleep , and the complaint continues for atleast a month , the disturbance must occur atleast 3 times a week/month. (ICD)

Sleep state misperception

Dissociation between the patients's experience of sleeping and objective polygraphic measures of sleep.

Treatment

Relaxation

Progressive muscle relaxation
Guided Imagery

Universal Sleep Hygiene

- Equilibrate bedtime and arising
- Keep bedroom cool , dark , quiet
- Avoid excessive caffeine
- Avoid heavy meal before bedtime

Medicines

Z drugs
Ramelteon
Melatonin

Stimulus Control Therapy

- Therapy given by Richard Boozin
- Go to bed only when Sleepy
- Do not lie in bed if not sleepy
- Avoid watching TV ,eating in bed
- Goal is to associate bed with sleep

Parasomnias

- Sleep disorders characterized by behavioural and physiological phenomena that occur during or potentiated by sleep.
- Wakefulness ,REM , NREM are 3 basic states.

Wakefulness	REM	NREM
Body and Brain are active	Atonic body with active brain	Body and Brain less active

REM : Sleep Disorders

REM sleep behaviour Disorder (RBD):

Failure of the patient to have sleep paralysis (atonia) during REM sleep stage.



Hypopolarization of alpha and gamma motor neurons is abolished



Results in enactment on the dream



Punching , leaping, kicking



Patient and bed partners suffer injuries (lacerations , fractures)

Occurs later part of the night

Rx

Clonazepam (partial agonist action)

Nightmares aka/Terrifying /frightening dreams

Occurs in REM sleep.

Awakens the person from complicated Dream(with sympathetic activation).



Remembers the dream (In NREM dreams not remembered)



Common 3-6 years of age



Drugs like L-DOPA,B-adrenergic blockers, alcohol abuse provoke Nightmares.



Rx
Alpha 1 antagonist (prazosin) : Evidence growing for PTSD associated nightmares
Benzodiazepines can be tried

Enuresis

NREM: Sleep Disorders

- a) Primary : Continuance of bedwetting since infancy
- b) Secondary : Relapse after toilet training achieved and period of remaining dry.

Child must be ≤ 5 years

Males > Females

ADHD frequently comorbid with Enuresis

Features

Poor self image

Embarrassment

Intrafamilial conflict

DSM 5- Behaviour must occur twice weekly for a period of at least 3 months or must cause distress and impairment in functioning

NREM: Sleep Disorders

Rx

Review toilet training

Positive conditioning (star chart),

Bell- pad alarm system (classical conditioning)

Medicines (Desmopressin, imipramine , reboxetine)

Psychosocial stressor precipitates enuresis

Birth of a sibling

School

Separation of a family

Move to a new environment

Somnambulism/sleep Walking

Occurs in NREM sleep



Common in children 4-8 years.



Begin towards 1st and 2nd NREM sleep phase.



Patient interacts with the environment inappropriately



Difficult to be awoken and if aroused are confused.

Specialised forms of sleep :

Sleep related eating

Sex somnia

Pavor Nocturnus/Sleep Terrors

- ✓ NREM sleep disorder
- ✓ Occurs during 1st third of night during stage 3 & 4.
- ✓ Sudden arousal with intense fearfulness associated with anxiety.
- ✓ Autonomic and behavioural manifestation marks the experience
- ✓ Amnesia for the episodes (IN REM phase Nightmares dreams are remembered).
- ✓ Sleep deprivation and psychological problems exacerbates the condition.
- ✓ Patients might get injured.

Sleep Related Movement Disorders

Restless Leg syndrome (Ekbom Syndrome)

- ✓ Uncomfortable subjective sensation of Legs (creepy-crawly feeling)
- ✓ Irresistible urge to move the leg while at rest or going to sleep
- ✓ Patients reports of ants crawling and walking over legs.
- ✓ Results into walking or moving the legs to alleviate discomfort
- ✓ Vicious cycle of moving the legs during sensation leads to insomnia.
- ✓ Seen during Iron& folic acid deficiency, Uraemia
- ✓ Condition associated with Fibromyalgia , Rheumatoid Arthritis ,COPD, thyroid disease.

Rx
Dopaminergic agonist
Pramipexole , ropinirole
levodopa
Benzodiazepines
mirtazapine

Periodic Limb Movement Disorder (PLMD)

- ✓ Aka Nocturnal Myoclonus
- ✓ Occurs in NREM phase
- ✓ Brief ,stereotypic, repetitive ,non epileptiform movements of the limbs (legs).
- ✓ Movements range from 0.5 – 5 secs and every 20-40 secs.
- ✓ Usually associated with brief arousal from sleep disturbing sleep architecture
- ✓ Associated with folate deficiency , anaemia, renal disease

Rx
Same as Restless leg syndrome

Sleep related Leg cramps:

Occurs in Legs during wakefulness.

Usually Affects calf and with painful muscle contractions.

Awakens the patient and disturbs sleep

Precipitated by Mineral deficiency ,metabolic problems ,diabetes, Pregnancy

Sleep related bruxism:

Occurs in Stage2 NREM

Individuals grinds or clenches teeth during sleep

Damages the teeth ,provoking jaw and tooth pain making unpleasant sounds that disturbs partner during sleep

Circadian Sleep disorders

- ✓ Circadian pacemaker (SCN) resets each day by bright light , social cues, stimulants and activity.
- ✓ Desynchrony between Individual's internal circadian biological clock and conventional sleep-wake cycle.
- ✓ Factors which fail to entrain SCN leads to Circadian sleep disorders

Delayed sleep Phase

- ✓ Aka Night Owls
- ✓ Biological clock runs slower than the regular 24 hour sleep wake cycle
- ✓ More alert in the evening and early night time
- ✓ More tired in the morning

Advanced sleep Phase

- ✓ Aka early birds or larks
- ✓ Circadian cycle shifted earlier.
- ✓ Sleepiness is advanced with respect to sleep time schedule.
- ✓ Drowsy in the evening retire to bed early
- ✓ More alert in the morning

Jet Lag/Shift work type

Desynchrony between circadian and environment clocks

When an individual rapidly travels across many times zones

Either Phase advance or Phase delayed is induced depending on the direction of travel.

Night owls (phase delayed) have difficulty travelling to east whereas Larks (phase advanced) will have difficulty travelling to westwards

Shift work type

Capital intensive enterprises run round the clock for financial gains.

Working in these environment demands frequent changes with the sleep –wake cycle.

Circadian rhythm becomes poorly entrained to the rapidly changing sleep patterns.

Rx
Stimulants (modafinil)

Treatment for Circadian Rhythm Disorders

Melatonin

Light therapy

Chronotherapy



Melatonin

Under normal circumstances melatonin secretion increases at dusk and stops during dawn on bright light

For phase advance patients melatonin given at nights whereas for phase delayed patients it is given at morning

Phototherapy

Bright Light of 10000 lux alters the altered endogenous biological rhythm.

Preferentially given when the core body temperature is lowest .

Bright light therapy given for phase advance patients during evenings whereas during morning during phase delayed patients

Hypersomnias

Excessive sleepiness is a serious debilitating potential life threatening non communicable condition.

Sleepiness

a) Insufficient sleep b) neurologic dysfunction c) disrupted sleep d) circadian rhythm changes

Affects attention , concentration, memory, higher order cognitive process

Sleep drunkenness – Episodic, irresistible sleep attacks which occurs in the morning

Consequences

1. Industrial disasters
2. Loss of Employment
3. Motor vehicular Accidents

Primary hypersomnia- is diagnosed when other causes cannot be found for excessive somnolence for atleast 1 month

Idiopathic hypersomnia

Age 15 -30 years involved commonly

Non refreshing Naps, difficulty awakening , sleep drunkenness

Automatic behaviours with amnesia

Autonomic nervous system typically involved

Migraine like headache

Fainting spells

Orthostatic hypotension

Raynauds Phenomenon with cold hands & feet.

Classified in 3 groups:

1. HLA cwl +ve - autonomic nervous system involvement
2. Post viral status- GB syndrome, Atypical pneumonia , mononucleosis
3. Non familial - idiopathic , non post viral

Menstrual related hypersomnia

Recurrent episodes of hypersomnia related to menstrual period

Experiencing recurrent episodes of marked hypersomnia which occurs before or at the onset of menses

Lasts 1 week and resolves with menstruation

Rx

Oral Contraceptives

Klein Levin Syndrome

Recurrent periods of Prolonged sleep with intervening periods of normal sleep and alert working

During hypersomnic episode , wakefulness periods are usually marked by withdrawal from social contacts with return to bed

Males > females

Recurrent episodes with extensive sleepiness

Voracious eating

hypersexuality

Disinhibiting behaviour

Episodes lasting days to weeks (1-10 times/years)

Narcolepsy

- Misnomer
- Neither type of epilepsy nor psychogenic disturbance
- Occurs in adolescence before 30 years
- HLA-DR2 associated in 90-100% of cases.(HLA-DQB1-0602)
- Disturbance of Central nervous system mechanism Genetically triggered hypocretin dysfunction & deficit.
- Autoimmune process damaging hypocretin containing cells in CNS .
- Strong emotions trigger Cataplexy eg anger , laughter

prevalence (0.02-0.16 %)

- Tetrad :

- i)Excessive daytime sleepiness
- ii)Cataplexy- sudden loss of muscle tone like weakness of knees, jaw drop etc
- iii) Sleep paralysis- mostly in mornings are awake and conscious but unable to move a muscle
- iv) Hypnagogic hallucinations – hallucinations while going to sleep , vivid perceptual experiences

Rx
Modafinil-Alpha-1 adrenergic agonist
TCA's,SSRI

Sleep related breathing Disorder

Sleep related breathing problems can either

- i) Hypoapnoea –reduction of air flow
- ii) Apnea- Complete absence of air flow

Sleep related problems can occur due to

Central brainstem changes- ventilatory control , metabolic factors, heart failure.

Classified

- a) Central Sleep Apnea
- b) Obstructive sleep Apnea
- c) Mixed.

Obstructive Sleep Apnea (OSA)

- Characterised by repetitive or partial collapse of upper airway in sleep.
- Functional obstruction of the upper airway leads to decrease in arterial oxygen saturation and transient arousal after which respiration resumes normally.(Respiratory effort continues but airflow ceases due to loss of airway patency)

Predisposing Factors:

Male, Obese , middle age, micrognathia/retrognathia, nasopharyngeal abnormalities , hypothyroidism, acromegaly.

Characteristic features:

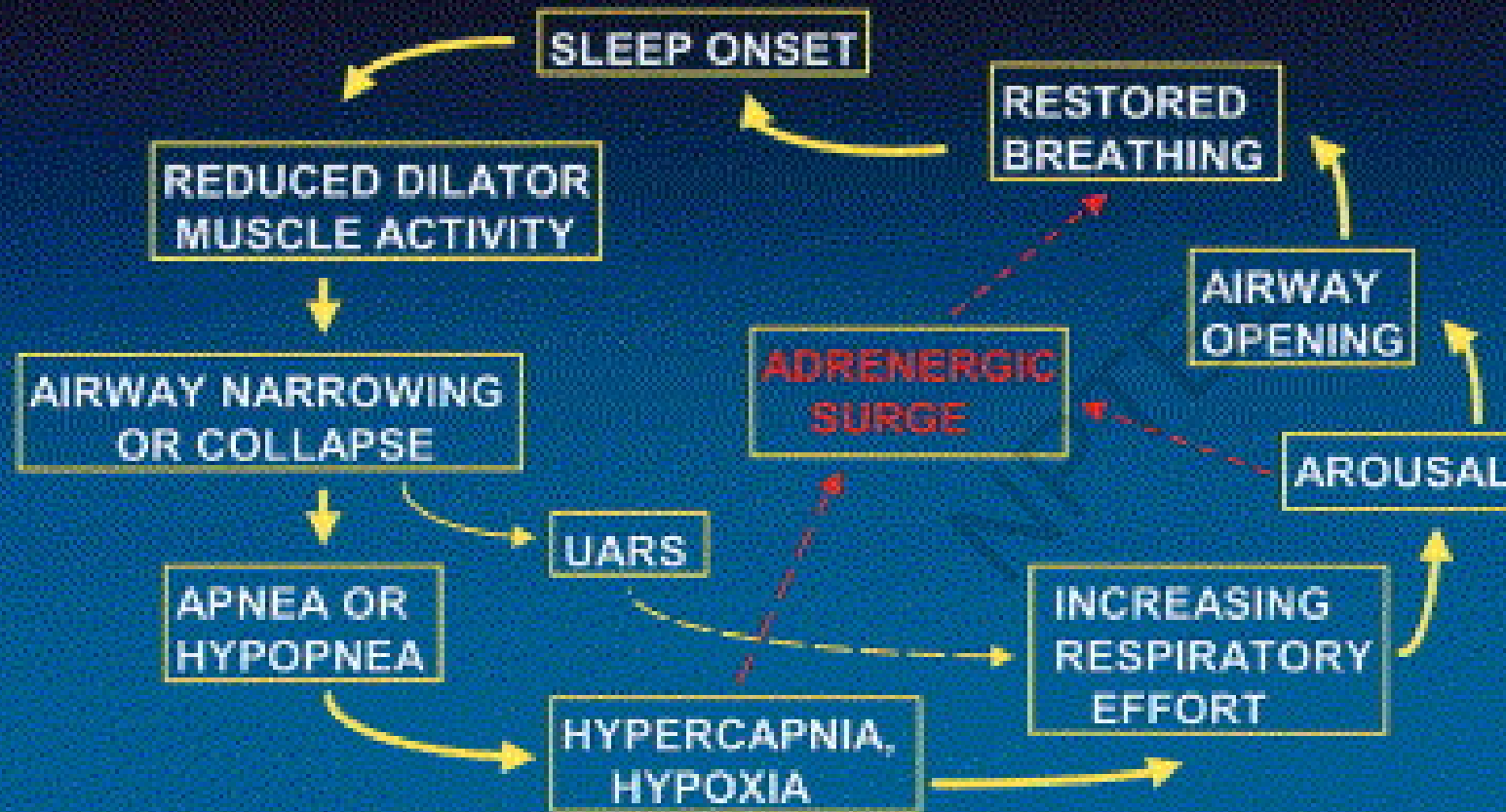
Sleepiness , Obesity , Snoring ,nocturnal awakenings, choking /gasping ,sweating and morning headaches etc

Can occur in any stage of sleep but specifically in REM.

Sleep Apnea- Cessation of breathing for 10 secs or more during sleep

Hypoapnea- A hypopnea is commonly defined as at least 30% reduction in airflow for 10 seconds associated with a 4% decrease in oxygen saturation.

OSA: PATHOPHYSIOLOGIC CYCLE



According American Academy of Sleep Medicine polysomnographic findings:

Airway obstruction producing complete cessation of breathing for 10 or more secs is scored as **Apnea**

Partial obstruction with consequent drop in oxygen saturation are designated as **Hypoapnea**

Partial obstruction without significant oxygen saturation but terminated by an arousal are scored as **respiratory effort related arousal (RERA)**

Number of apnea episodes per hour of sleep is termed **Apnea index (AI)**

Number of apnea plus hypoapnea episodes per hour –**apnea plus hypoapnea index (AHI)**.

Number of apnea plus hypoapnea plus RERA episodes **Respiratory disturbance Index (RDI)**

Gold standard for the diagnosis of OSA is the overnight polysomnogram.

It includes electroencephalographic, electro-oculographic, electromyographic, oxygen saturation, oral and nasal airflow, respiratory effort, electrocardiographic, and leg movements.

Rx

1. Weight loss
2. Oral Appliances
3. Surgical Intervention (tracheostomy, Palatopharyngovuloplasty)
4. Positive Pressure Ventilation (CPAP, BPAP)
5. Oral medications (FDA approved –Modafinil)

Central Sleep Apnea

Defined as absence of breathing due to lack of respiratory effort.

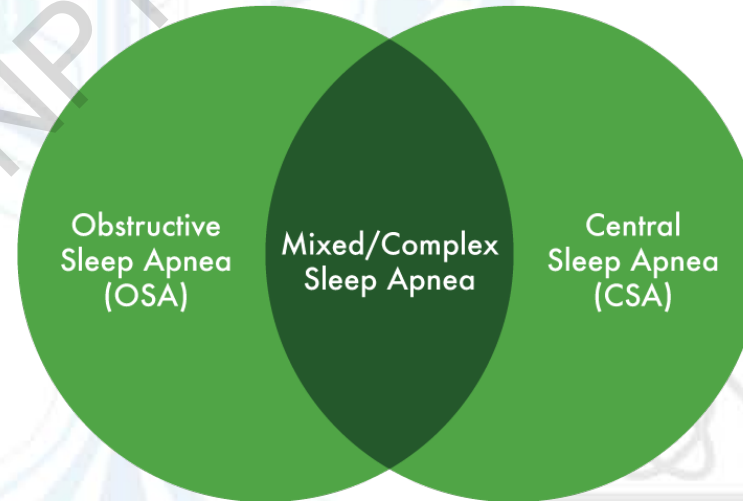
It is a disorder of ventilatory control in which repeated episodes of apneas and hypoapneas occur in a periodic or intermittent pattern during sleep caused by variability in respiratory effort.

(CSA-Absence of respiratory effort in abdominal & chest expansion)

(OCA- no absence of respiratory effort)

DSM 5 classifies into 3 types

1. Idiopathic
2. Chenes Stokes breathing pattern
3. CSA comorbid with opioid use



Idiopathic

Low normal arterial CO₂, while awake and have a high ventilatory response to CO₂.

Present with daytime sleepiness insomnia or awakenings with shortness of breath.

Respiratory cessations during sleep occur independent of ventilatory effort.

Polysomnography reveals 5 or more central apneas per hour of sleep

Cheyne-stokes breathing

Pattern consisting of prolonged hyper apneas during which tidal volume gradually waxes and wanes.

Hyper apneas alternate with hypo apnea and apnea episodes which are associated with reduced ventilatory effort.

Common in older age group with congestive cardiac failure (CCF).

Daytime sleepiness, insomnia, shortness of breath during awakenings

Polysomnography reveals 10 or more central apnea or hypoapnea episode per hour of sleep

REFERENCES

1. **Comprehensive Text Book Of Psychiatry (Kaplan & Sadock)**
2. **Oxford Text Book OF Psychiatry**
3. **Tasman & Leiber mann (Text Book Of Psychiatry)**
4. **Sleep Health: Can We Define It? Does It Matter? Daniel J. Buysse, MD**
5. **Obstructive sleep apnea Asher Qureshi, MBBS, and Robert D. Ballard, MD Denver**

CONCLUSIONS

- In this lecture we have learned regarding concepts related to sleep disorder & its classification.
- Insomnia its treatment
- Various disorders related to hypersomnia
- Narcolepsy and its characteristic features & treatment
- Circadian Rhythm disorders and sleep related breathing disorders in brief



**THANK
YOU !**



NPTEL ONLINE CERTIFICATION COURSES

Basics of Mental Health & Clinical Psychiatry

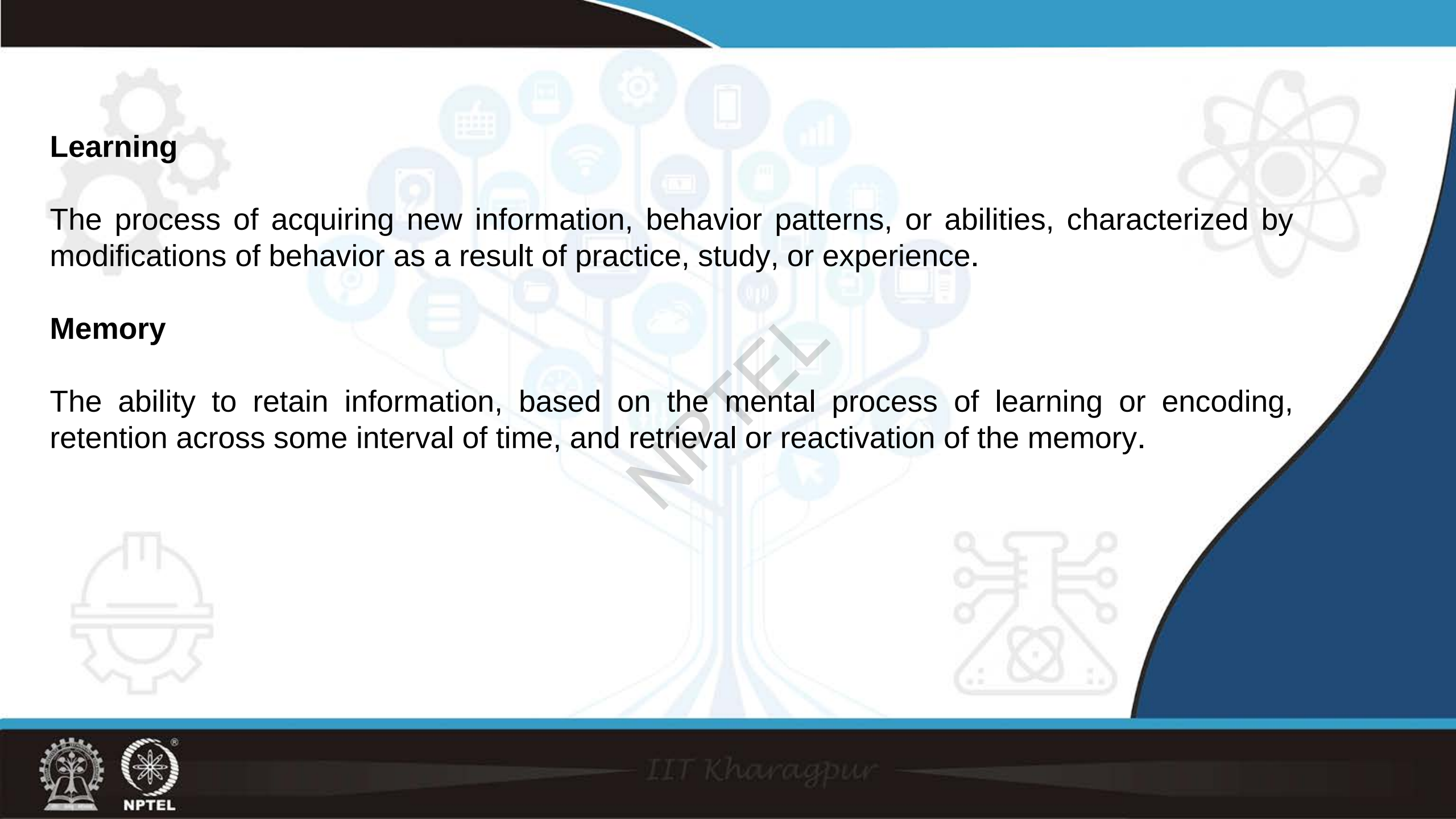
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IIT KHARAGPUR**

Lecture 22: Learning & Memory -1

CONCEPTS COVERED

- Learning & Memory
- Functional organization of memory
- Types of memory
- Cellular mechanisms of short term and long term memory

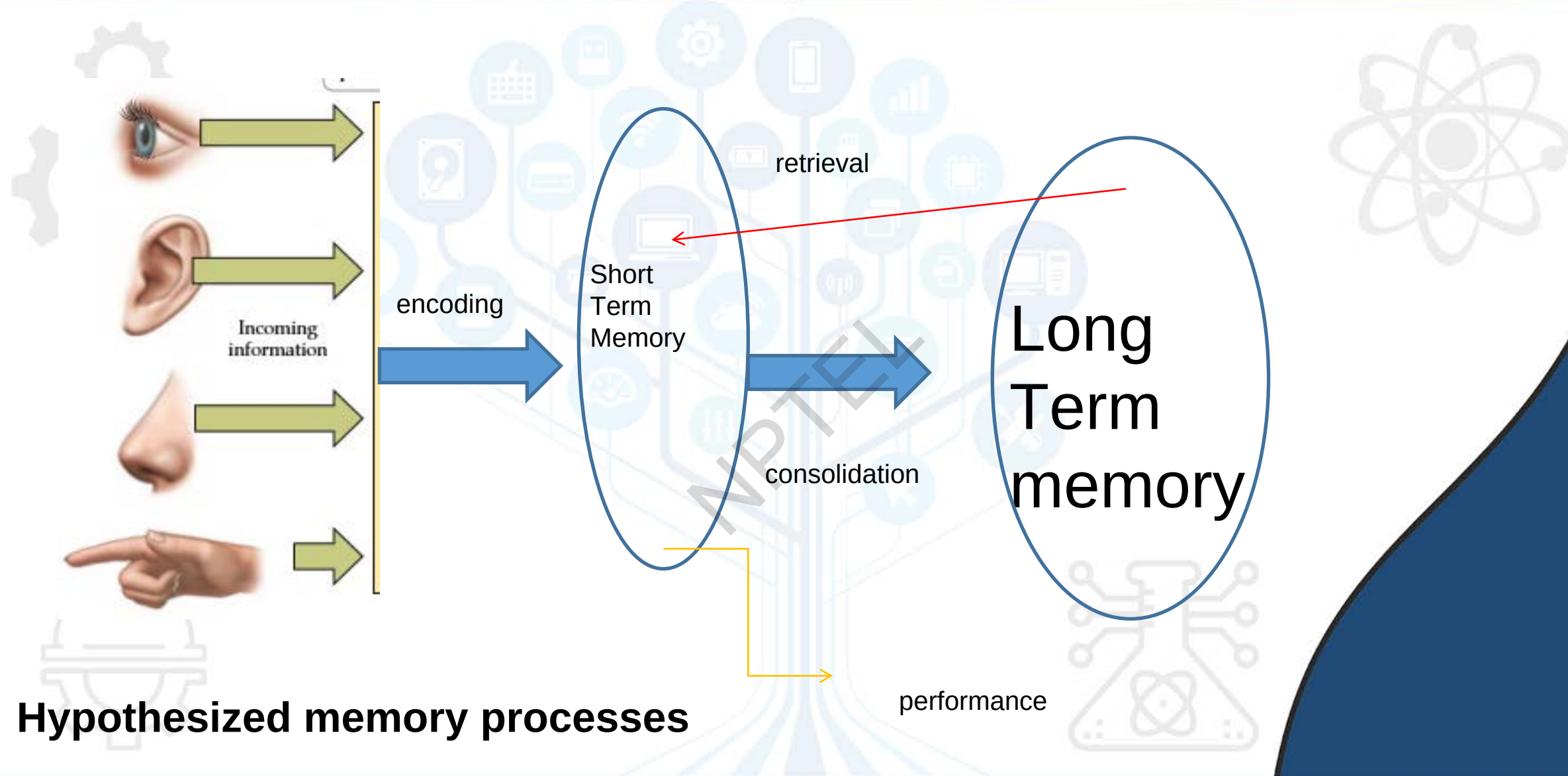


Learning

The process of acquiring new information, behavior patterns, or abilities, characterized by modifications of behavior as a result of practice, study, or experience.

Memory

The ability to retain information, based on the mental process of learning or encoding, retention across some interval of time, and retrieval or reactivation of the memory.



Hypothesized memory processes



Henry Molaison

Brain regions crucial for memory formation

Normal brain



Hippocampus

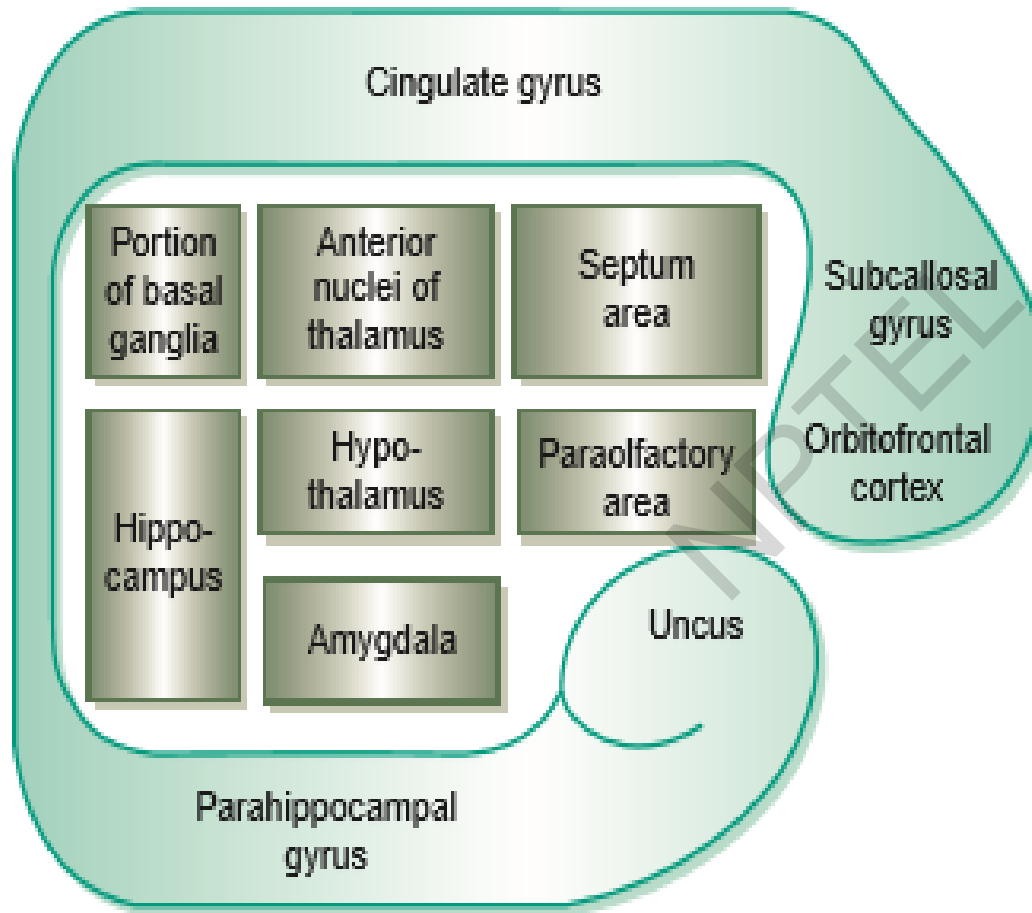
H.M.'s brain



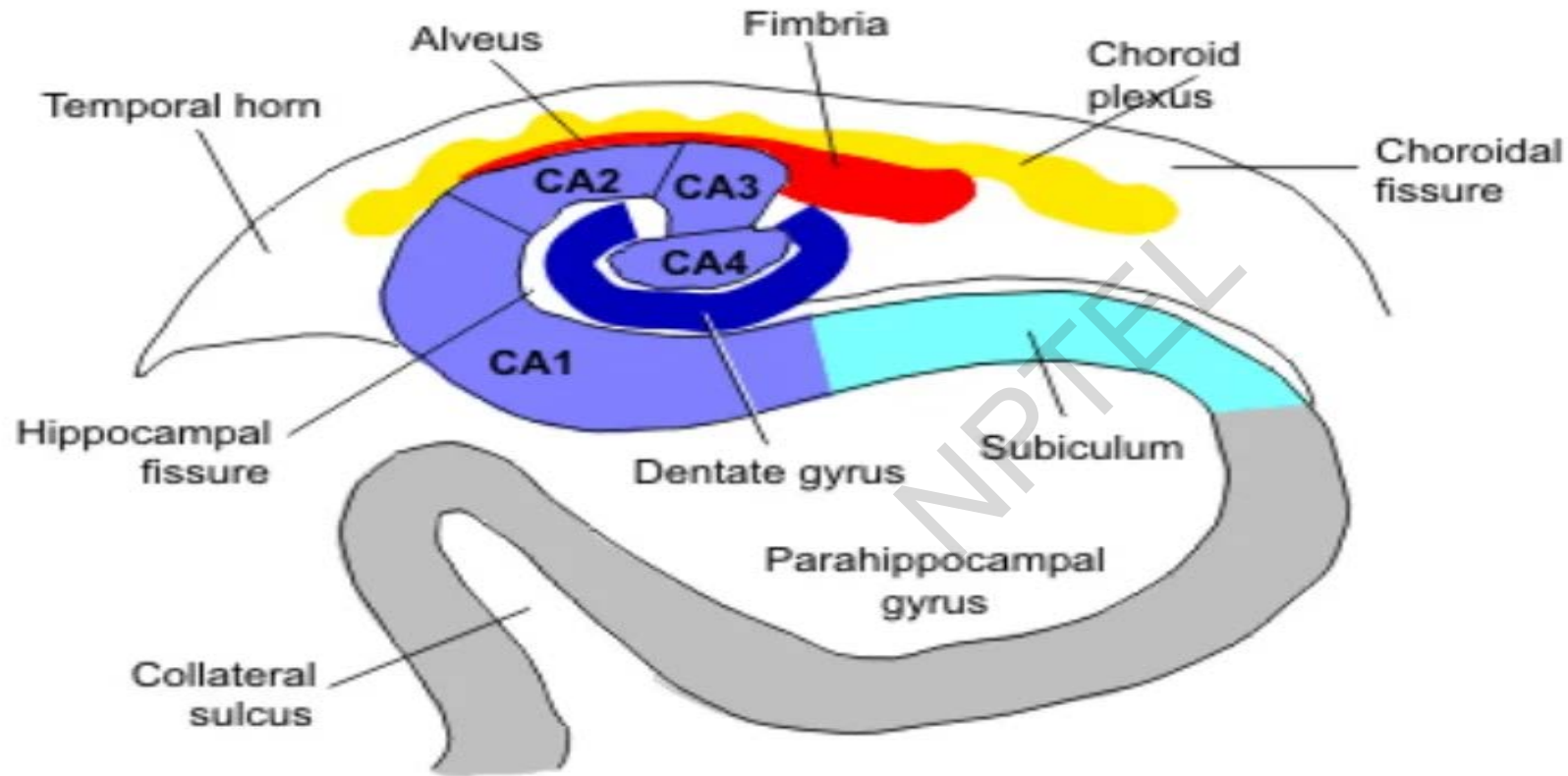
Hippocampus removed



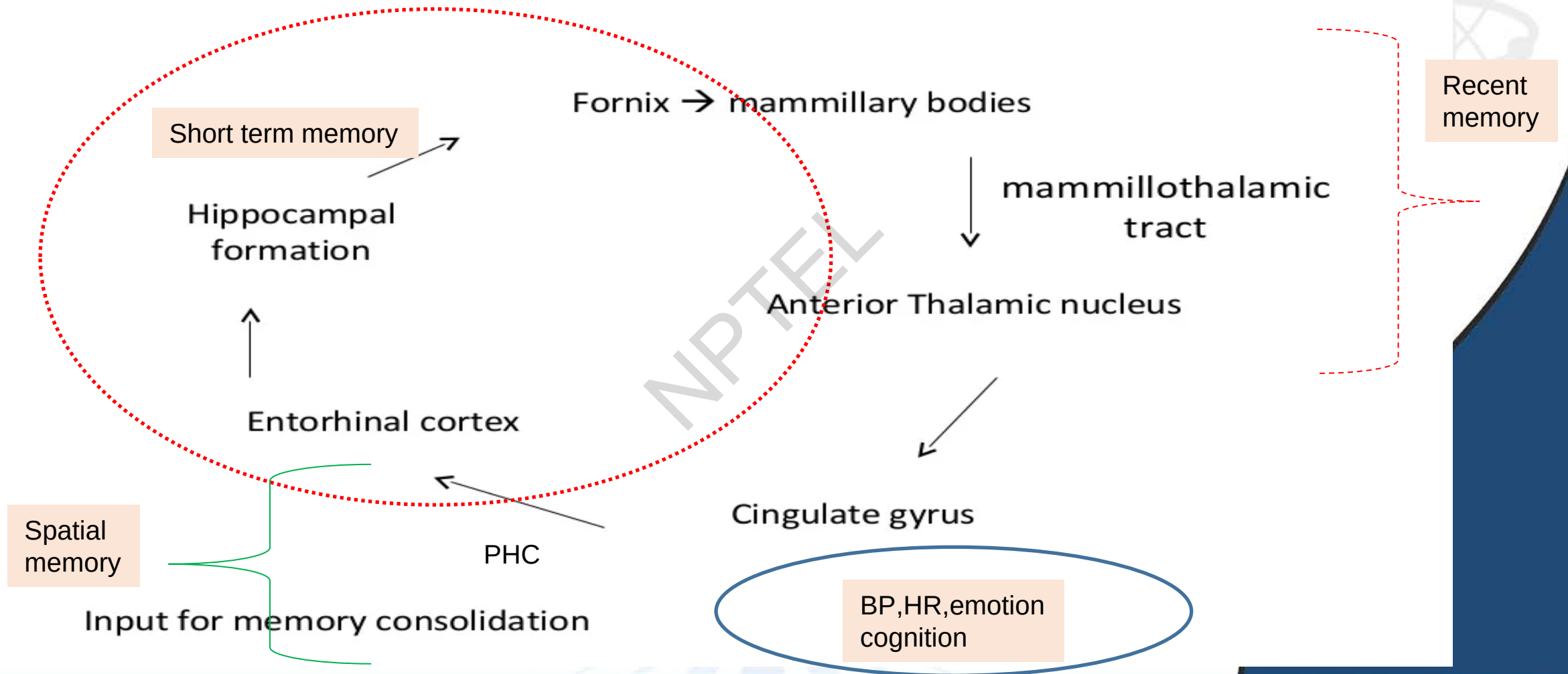
Limbic System.....



Hippocampal Anatomy

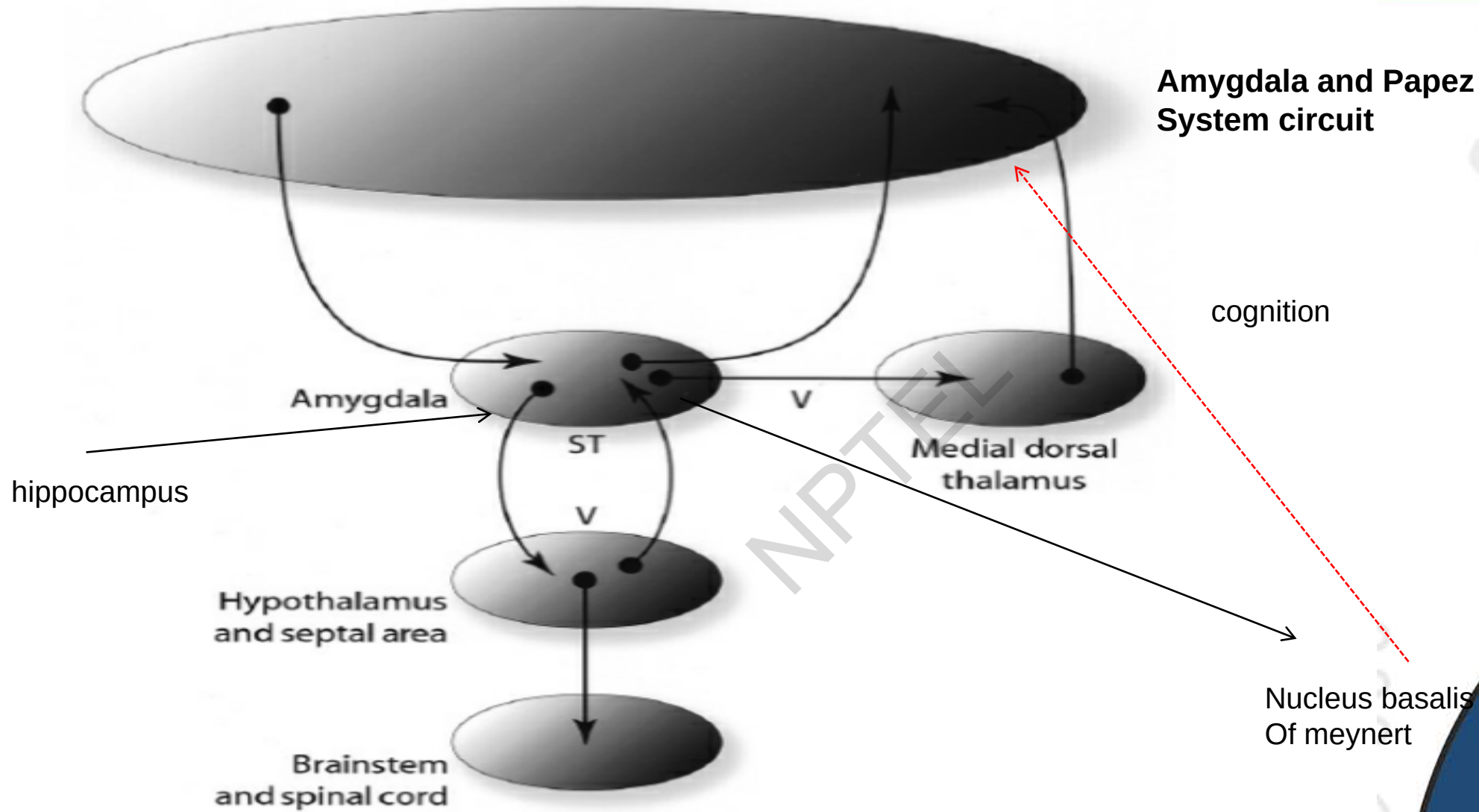


Papez' Circuit:

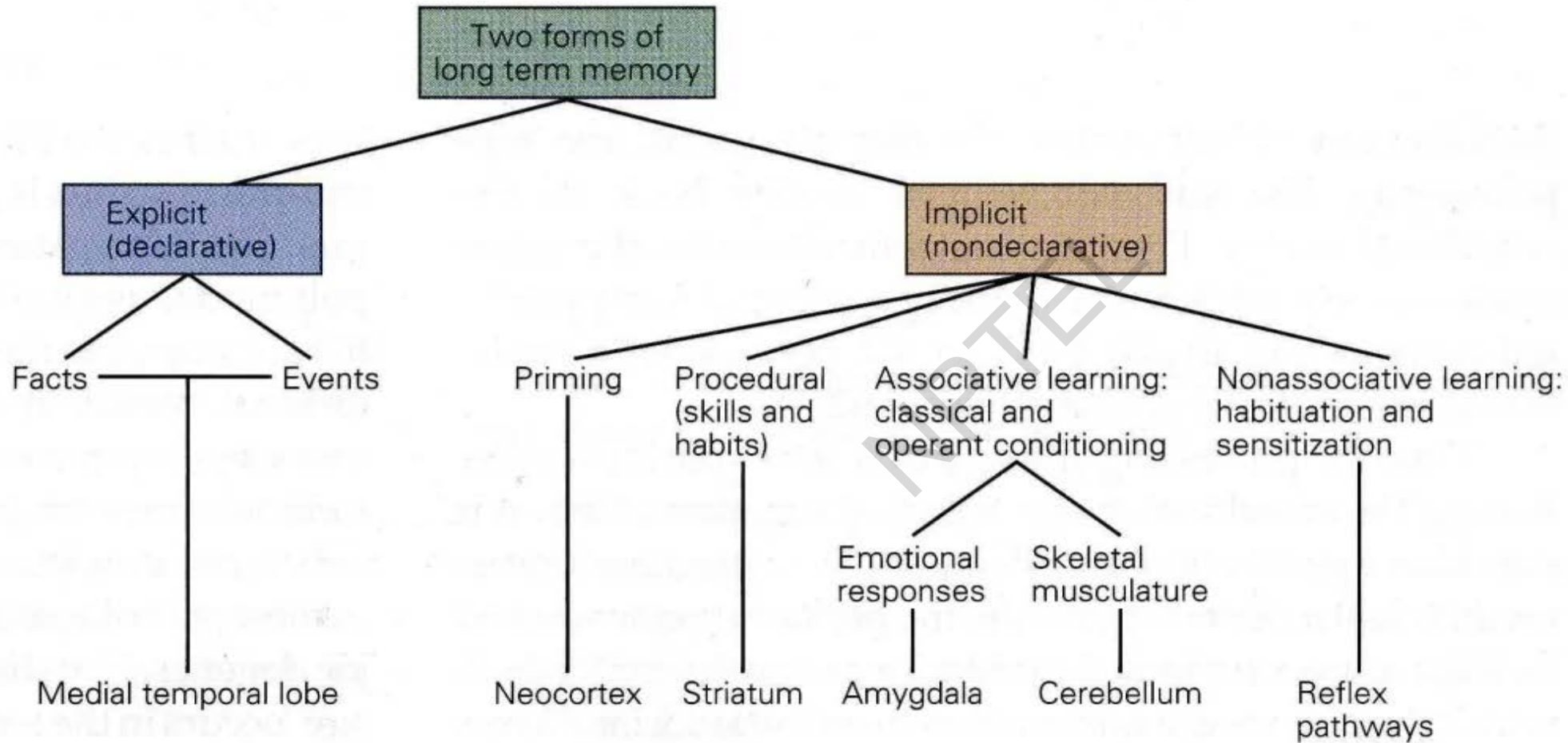


Prefrontal and temporal association cortices

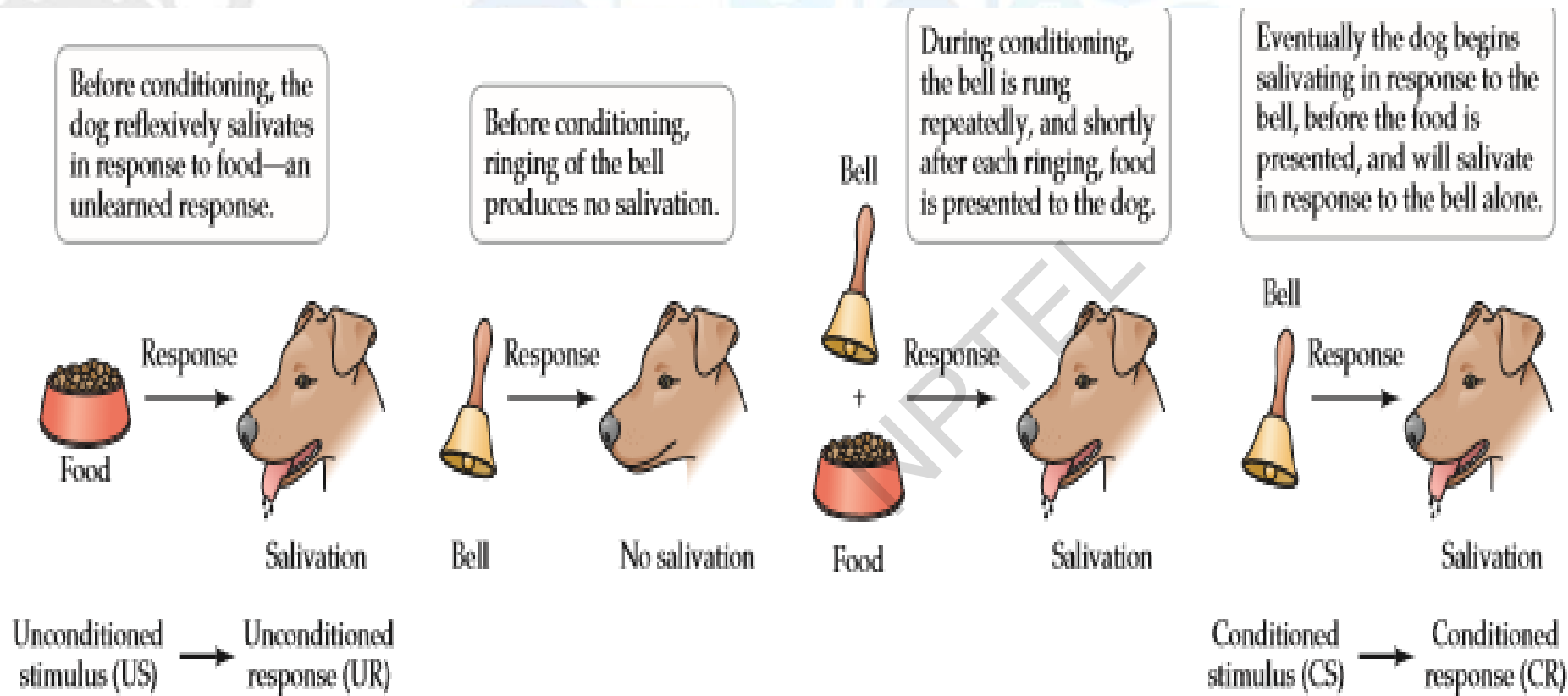
Amygdala and Papez circuit- Limbic System circuit



Two Types of Memory



Associative learning- Classical conditioning



Association between 2 stimuli

Operant conditioning

Association between stimulus and behaviour

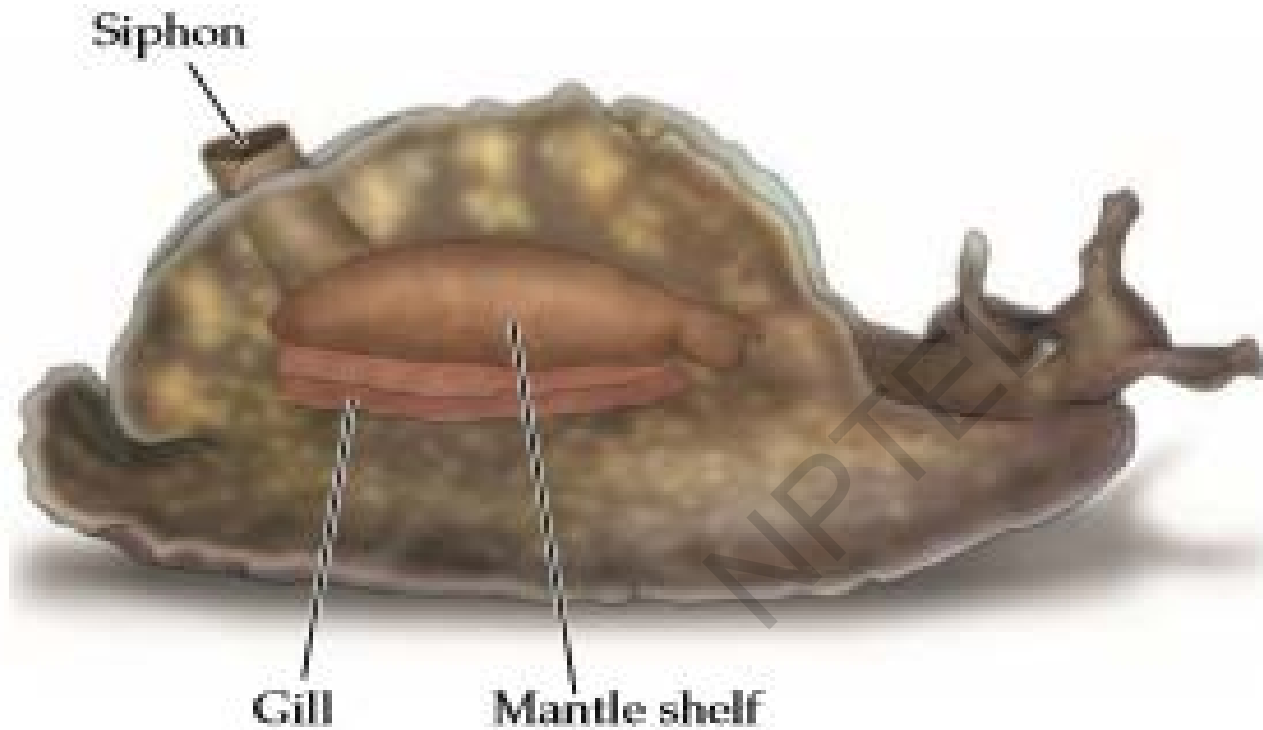


Food
Pellets

Signal
Buttons

Electric
panels

Non-associative learning

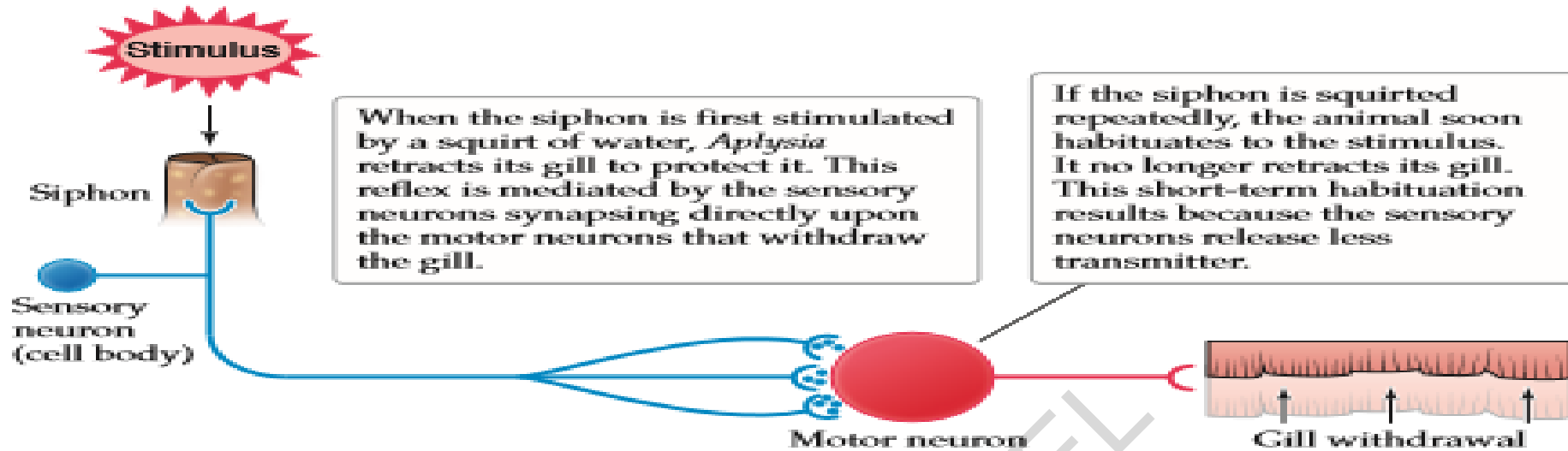


Habituation

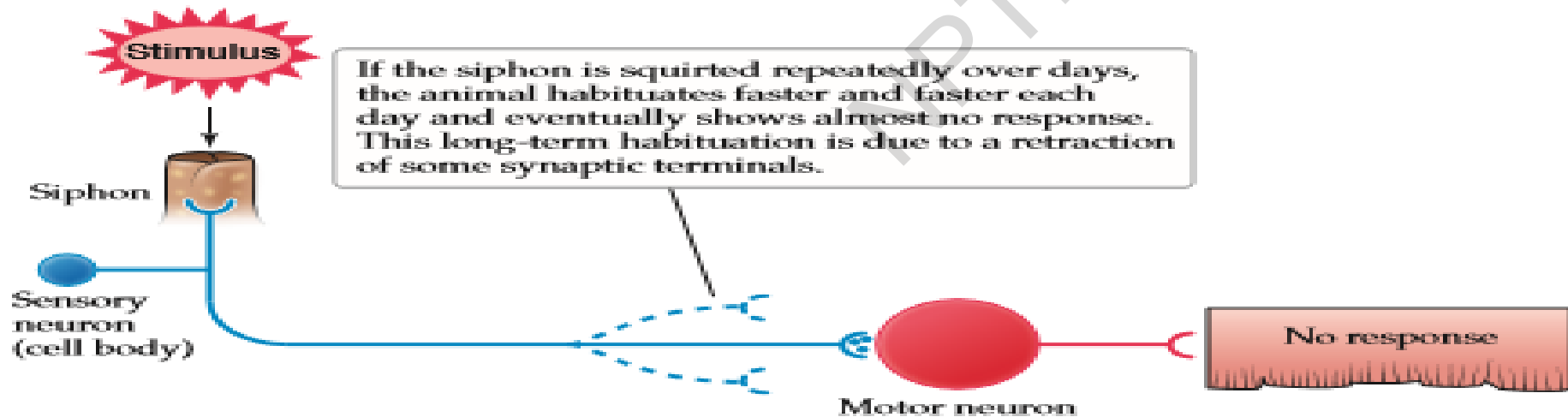
Sensitization

A Nobel Prize-winning program of research focused on Aplysia by Kandel

(A) Short-term habituation



(B) Long-term habituation



Synaptic plasticity
underlying habituation
in aplysia

Keypoints

- The hippocampus, mammillary bodies, and dorsal thalamus form new declarative memories.
- Declarative memory consists of semantic memory of facts and episodic memory of particular incidents in the past.
- Non-declarative memory, which includes skill learning, priming, associative and non-associative learning.
- Non-associative learning includes habituation, while associative learning includes classical conditioning and operant conditioning.

REFERENCES

1. Behavioural Neuroscience, Breedlove, 6e
2. Nestler, E., Hyman, S., and Malenka, R. (2014). Molecular Neuropharmacology (3rd ed.). New York: McGraw-Hill.
3. Guyton and Hall Textbook of Medical Physiology, John E. Hall, 13e
4. Medical Physiology, Walter F. Boron, 3e



**THANK
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NPTEL ONLINE CERTIFICATION COURSES

Basics of Mental Health & Clinical Psychiatry

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Lecture 23: Learning & Memory -2

CONCEPTS COVERED

- Plasticity
- Long term potentiation
- Pathophysiology of AD (Applied aspect)

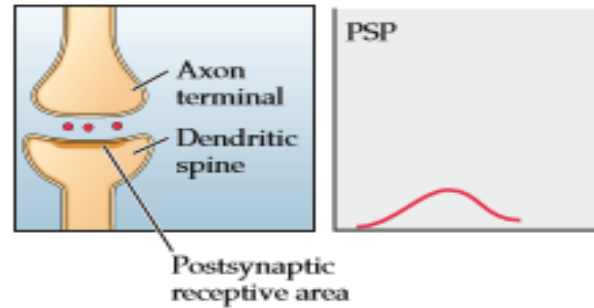
NPTEL

Neuroplasticity

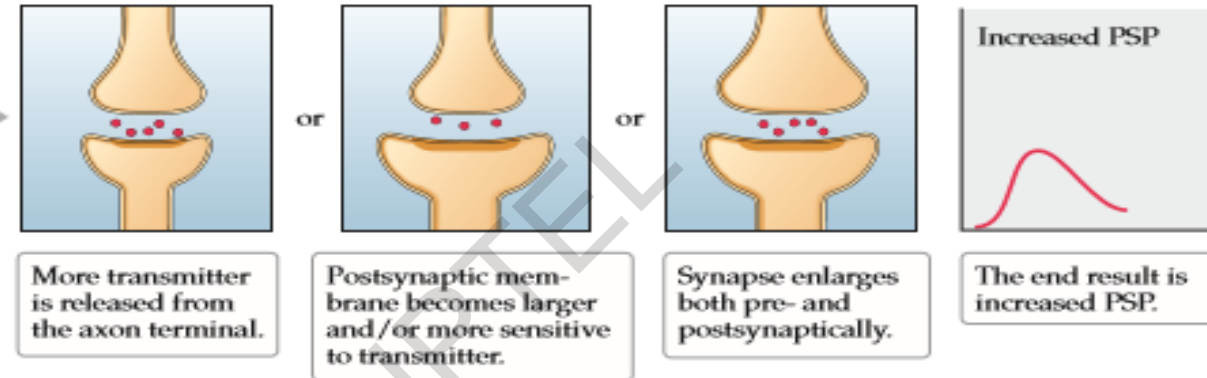
The ability of the nervous system to change in response to experience or the environment

Before training

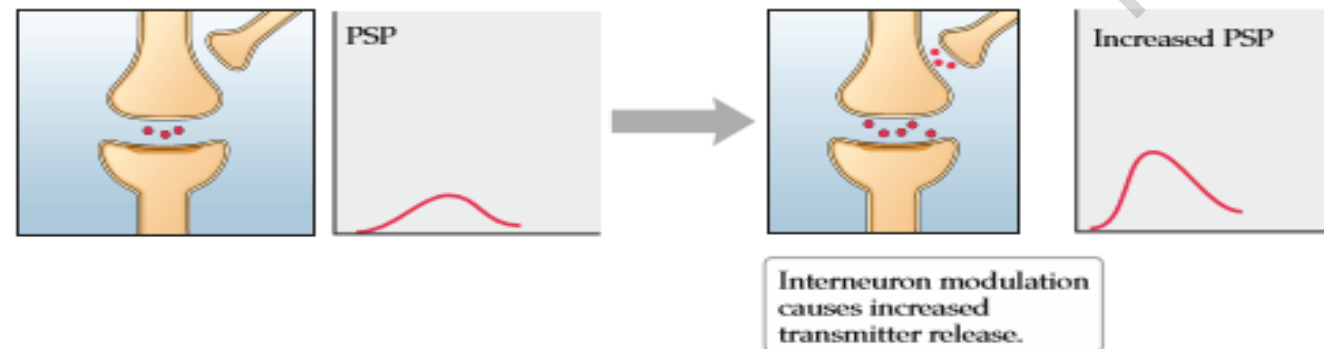
(A) Changes involving synaptic transmitters



After training



(B) Changes involving interneuron modulation



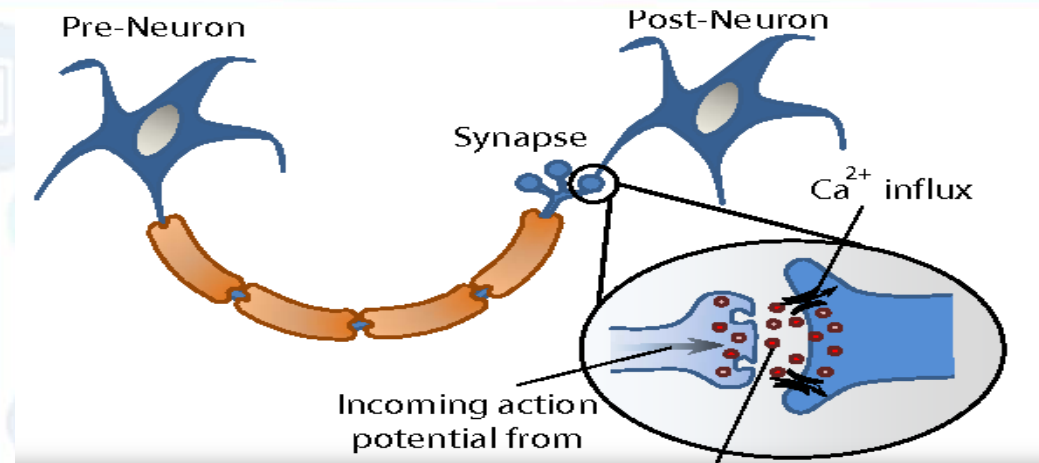
Donald Hebb

Post tetanic
potentiation

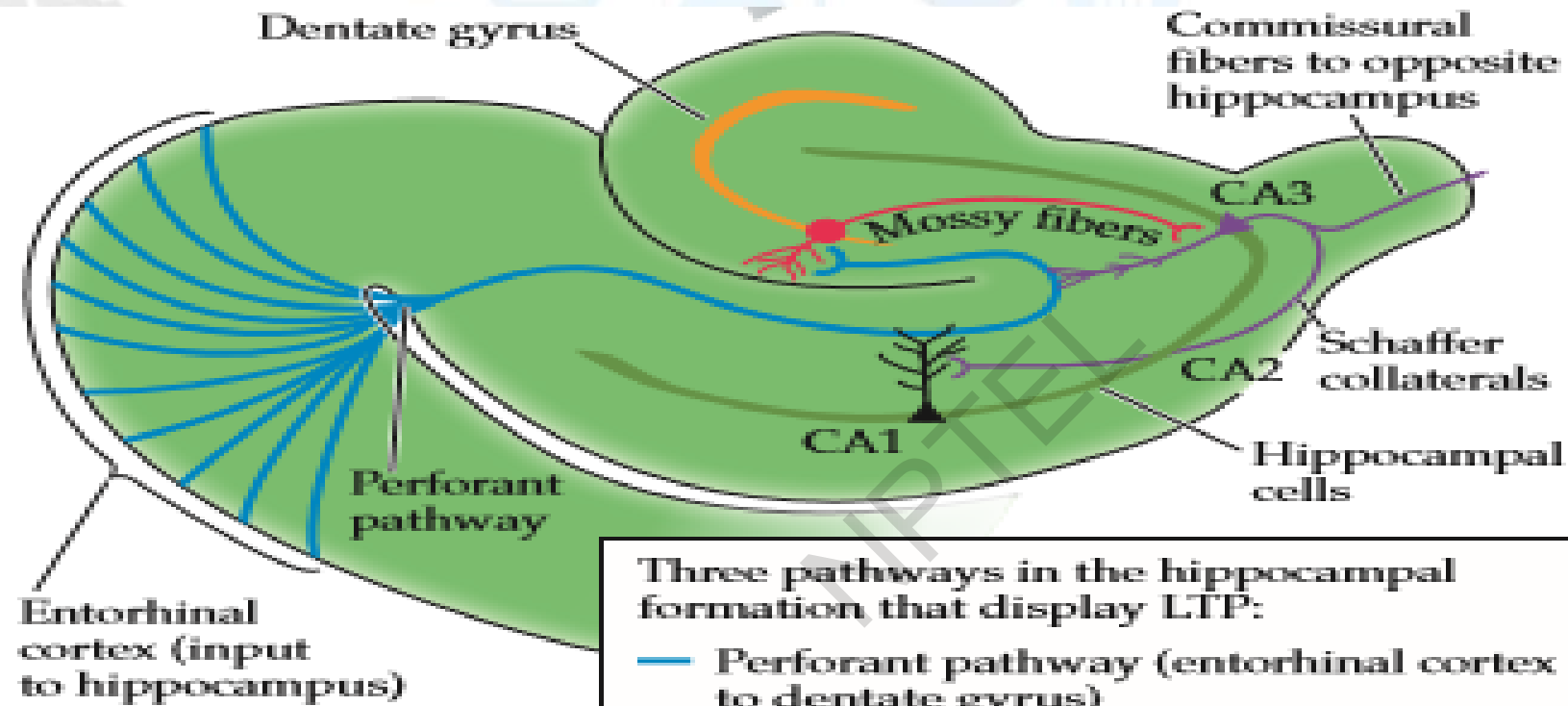
Memory
formation

Long term
potentiation

Long term
depression



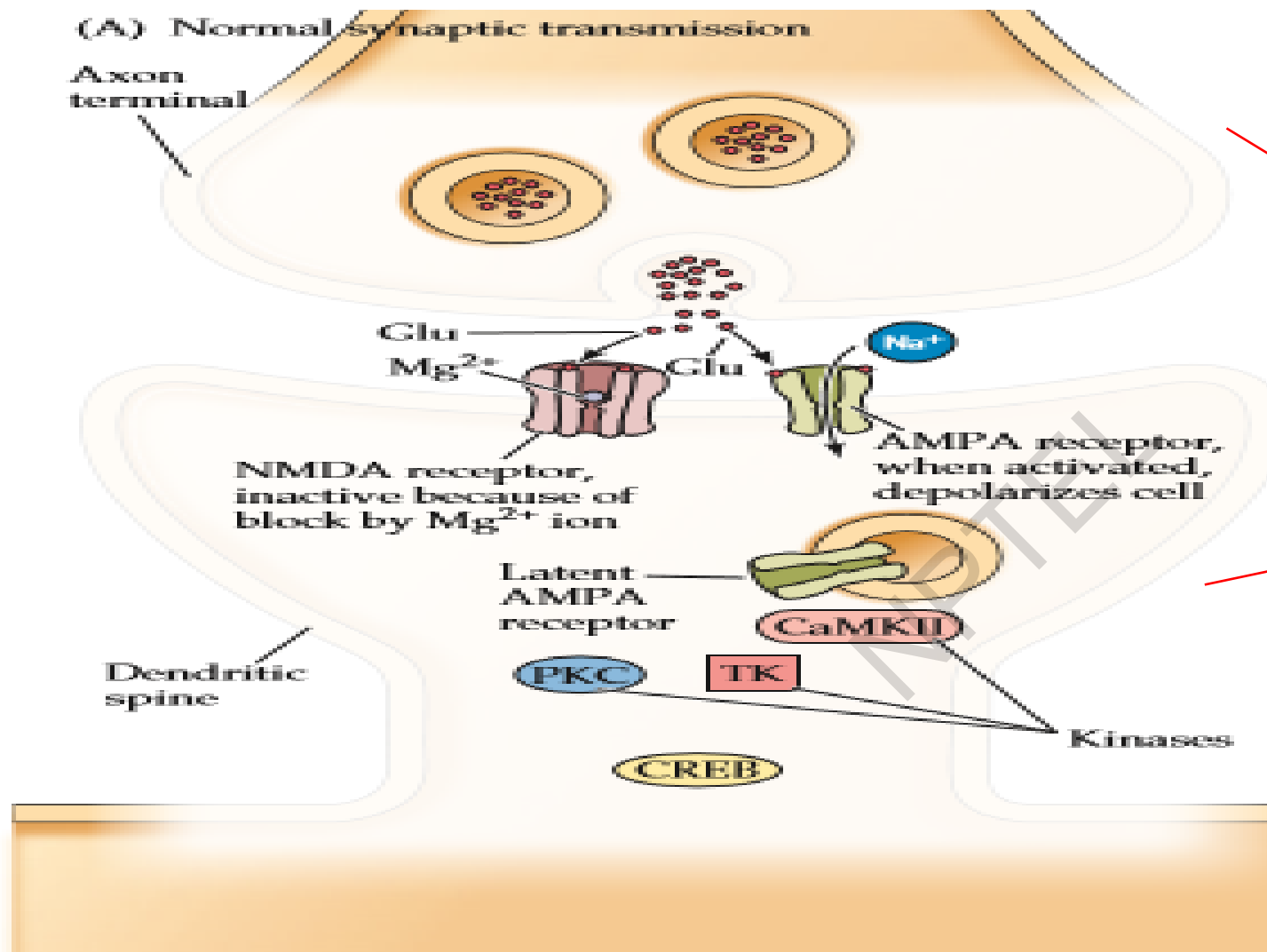
Long term potentiation



Three pathways in the hippocampal formation that display LTP:

- Perforant pathway (entorhinal cortex to dentate gyrus)
- Mossy fiber pathway (dentate gyrus to CA3 pyramidal cells)
- Schaffer collaterals (CA3 pyramidal cells to CA1 pyramidal cells)

(A) Normal synaptic transmission

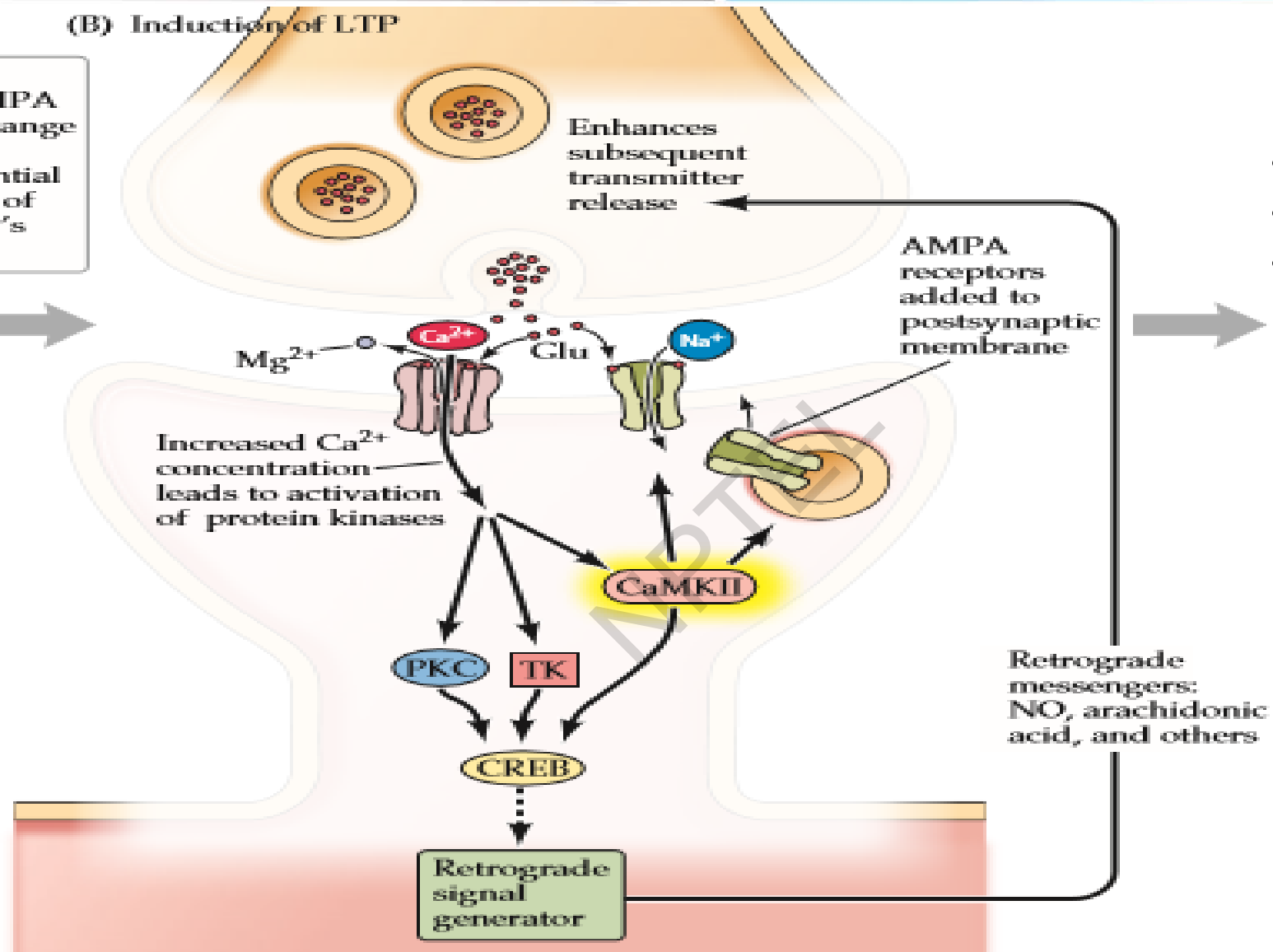


CA3 axon
Presynaptic

CA1- Post-
Synaptic

(B) Induction of LTP

With repeated activation of AMPA receptors, the change in postsynaptic membrane potential drives Mg^{2+} out of NMDA receptor's Ca^{2+} channel.



Permanent changes

- $\uparrow$ synaptic knobs
- $\uparrow$ surface area
- $\uparrow$ NT

Age-related impairments of memory

- 1. Memory loss
- 2. Cognitive dysfunction
 - apraxia
 - agnosia
 - executive functions impairment

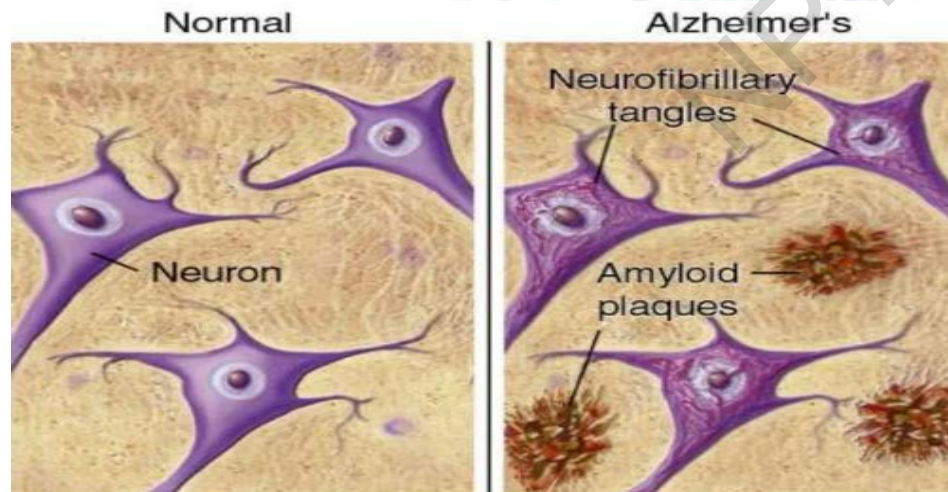
**Impairments of
encoding and
retrieval**

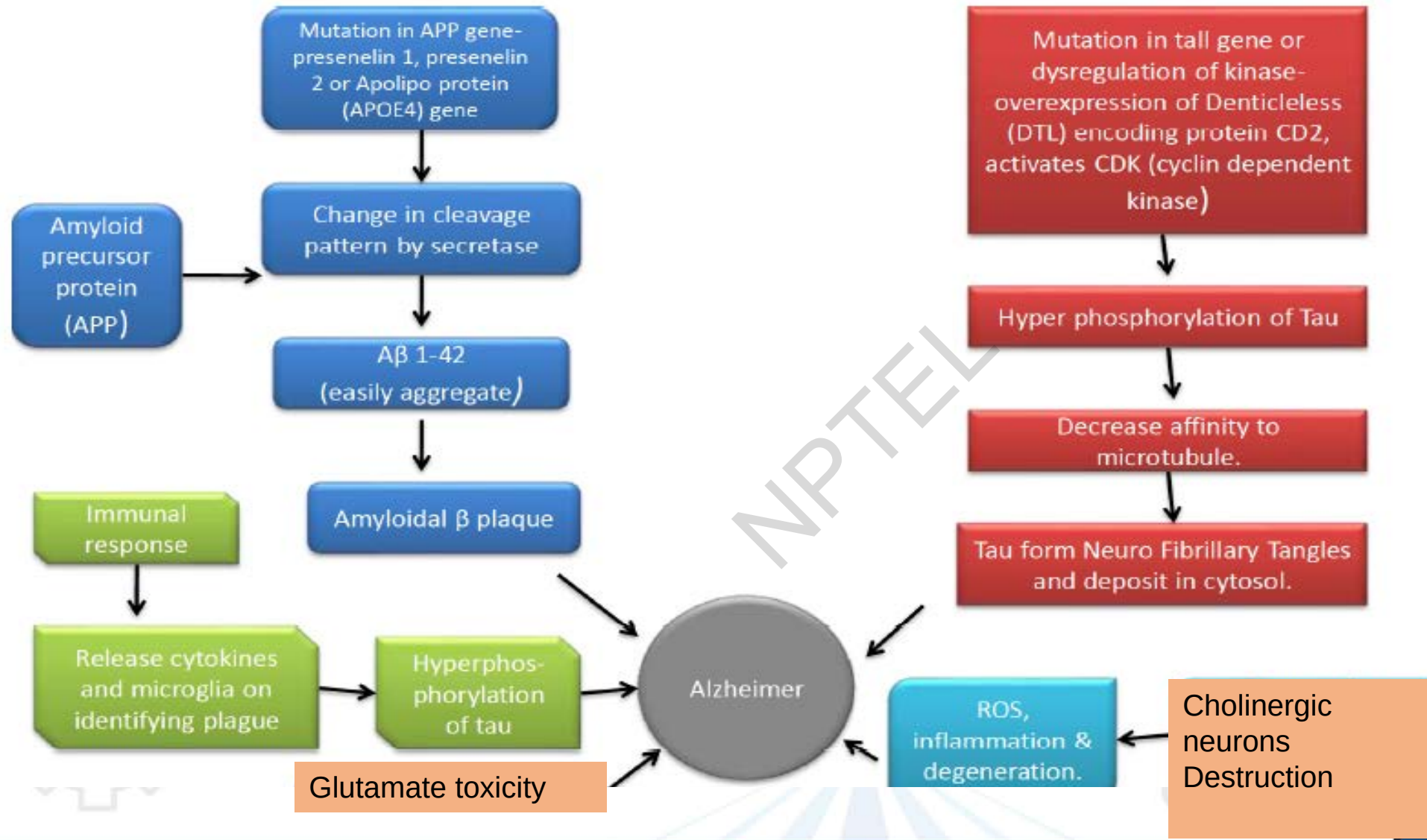
**Loss of neurons
and/or neural
connections**

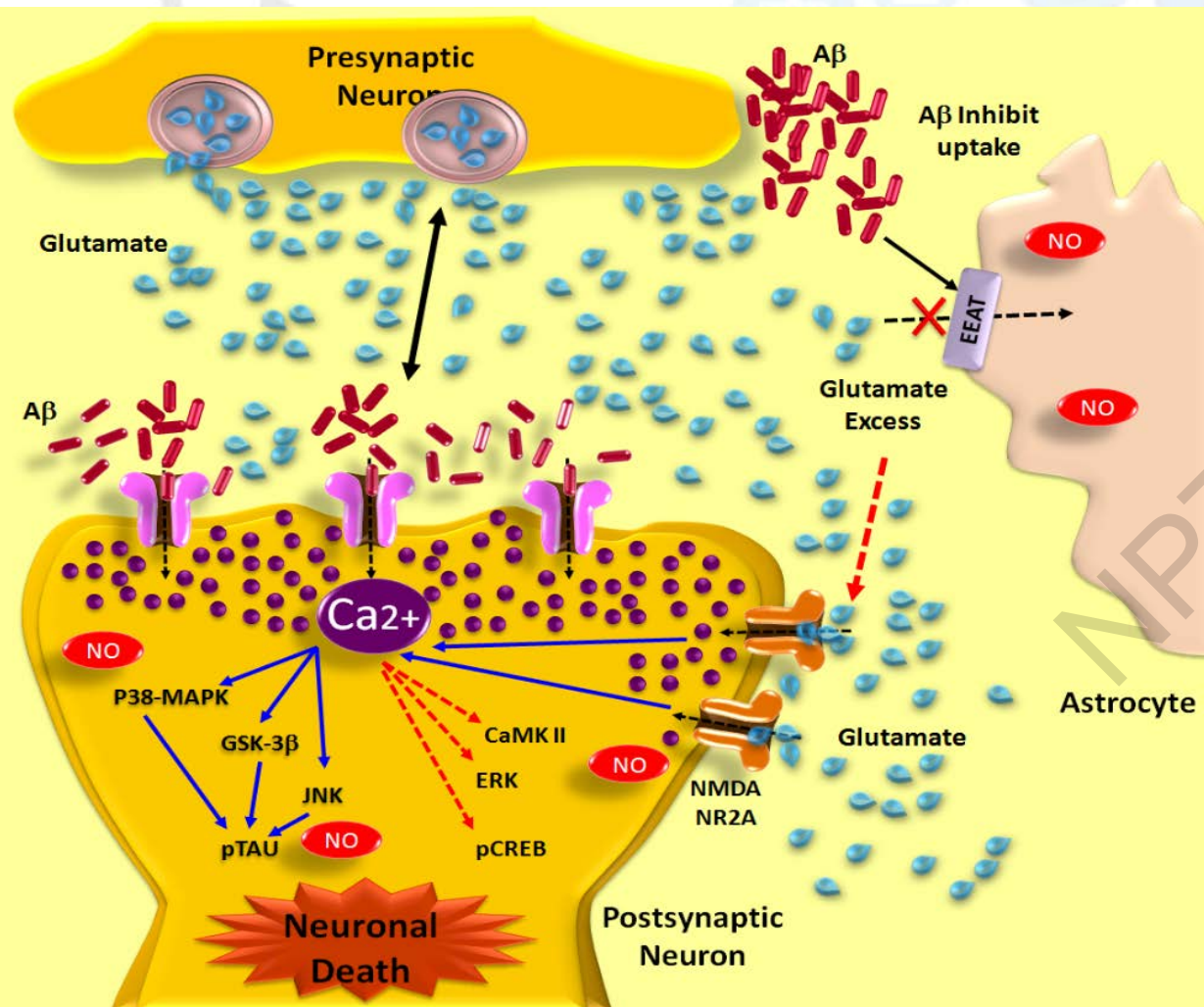
**Problems with
cholinergic
neurotransmission**

Introduction

- Alzheimer's disease (AD) is a heterogenous neurodegenerative disease
- Two characteristic features are **extracellular β amyloid deposition as neuritic plaques** and **intracellular accumulation of hyperphosphorylated tau as neurofibrillary tangles**.
- These eventually cause loss of connections between nerve cells and loss of brain tissue.
- AD was first identified by a German neuropathologist and psychiatrist, Alois Alzheimer and named after him.







- Increased pre-synaptic release of glutamate
- Blockade of glutamate uptake by astrocytes through glutamate transporters
- Glutamate concentration in synaptic cleft increases
- Activation of NMDA receptors increases the influx of calcium
- Activation of signaling pathways

Glutamate induced toxicity

- Cholinergic neurons of nucleus basalis of Meynert get destroyed.
- Permeability of the blood brain barrier hampered.
- Expression of choline acetyl transferase is reduced and that of acetylcholinesterase (AChE) is increased
- AChE interacts with A β peptide and promotes plaque formation
- There is a loss of serotonergic neurons from the brainstem of many AD patients and neurotransmitter level was also found to be less.

Decrease in
neurotransmitter level

Keypoints

- The successive processes transferring information from one place to the other are encoding, consolidation, and retrieval.
- LTP depends on the activation of NMDA receptors, which induces an increase in the number of postsynaptic AMPA receptors and greater neurotransmitter release.
- Cholinergic projections from basal forebrain gets disrupted in AD resulting in memory loss and cognitive dysfunction.
- Although β amyloid deposition and NFTs are considered pathognomic, there are some other fundamental discoveries which highlight important pathological roles for other critical cellular and molecular processes.
- The only conclusive way to diagnose AD is brain autopsy.

REFERENCES

1. Behavioural Neuroscience, Breedlove, 6e
2. Nestler, E., Hyman, S., and Malenka, R. (2014). Molecular Neuropharmacology (3rd ed.). New York: McGraw-Hill.
3. Guyton and Hall Textbook of Medical Physiology, John E. Hall, 13e
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NPTel ONLINE CERTIFICATION COURSES

Course Name Basics Of Mental Health & Clinical Psychiatry

Faculty Name Dr Sumit Kumar

Department Name Psychiatry

TATA MAIN HOSPITAL

Lecture 24

: Neurocognitive Disorders-I

CONCEPTS COVERED

1. Clinical features of Alzheimer's Dementia
2. Epidemiology
3. Risk Factors
4. Behaviour and Psychological symptoms of Dementia
5. Imaging
6. Differential Diagnosis (Delirium , /geriatric Depression)
7. Case Vignette
8. Management (Pharmacological + Non pharmacological)



Senior
moments!

"Just when I thought I had all the answers, I forgot what the questions were."



PERSONAL RELEVANCE

- Family



Concept and evolution

- Dementia is a slow, neurodegenerative disorder ,with no fixed events that define its onset.
- It is particularly challenging for clinicians to identify transition points for individual patients.
- Beyond the **binary diagnosis** of the **presence or absence** of dementia.
- First clinical criteria for MCI were proposed by a group of investigators from the Mayo Clinic in the late 1990's
- **Multiple definitions have been proposed to capture the intermediate stage between healthy ageing with slight cognitive changes and dementia .**
- Of these clinical labels by far the most successful and enduring has been the term **MILD COGNITIVE IMPAIRMENT (MCI).**

MCI: Mild Cognitive Impairment

Normal brain -----> MCI----->Alzheimers Dementia



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graph LR; A[Normal brain] --> B[MCI]; B --> C[Alzheimers Dementia];
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Mild Cognitive Impairment

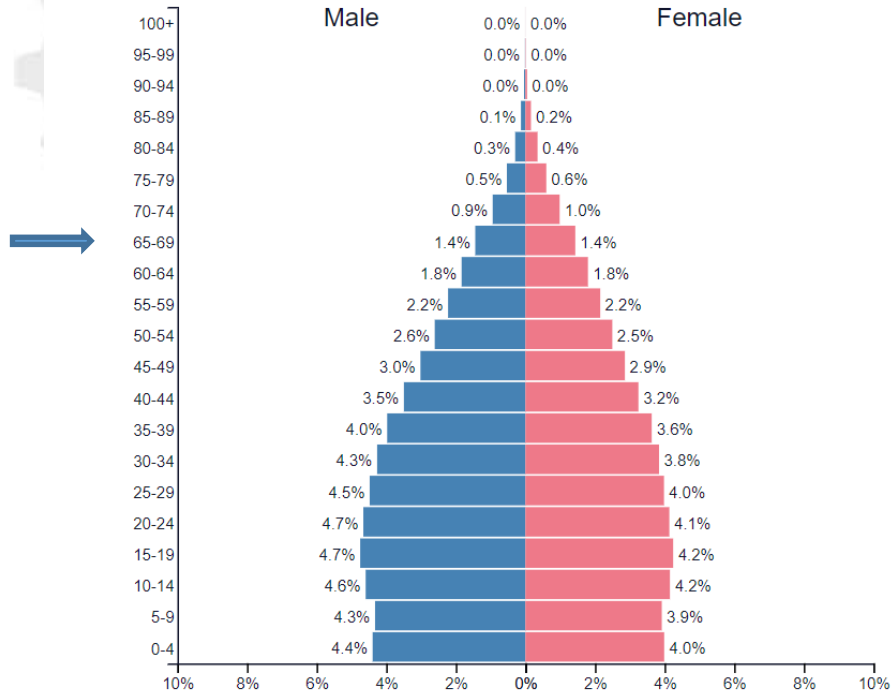
Mayo Clinic Criteria:

- ❑ Memory complaint (Informant)
- ❑ Memory Impairment for age and education
- ❑ Preserved general cognitive function
- ❑ Intact ADL
- ❑ No Dementia

- According to WHO estimates, ~**50 million** people have dementia worldwide, with 10 million new diagnoses every year.
- **It is projected that around one in five persons from low- and middle-income countries are going to be above 60 years of age by 2050**
- In India, in a **Phase of Demographic Transition**
- **1 elderly person for every 10 working-age persons,**
↓
1 elderly for every 3 working-age population by 2100.
- The Global Burden of Disease Study (2016)
3.74 million people in South Asia had dementia,
2.93 million people from India (total population 1.36 billion)

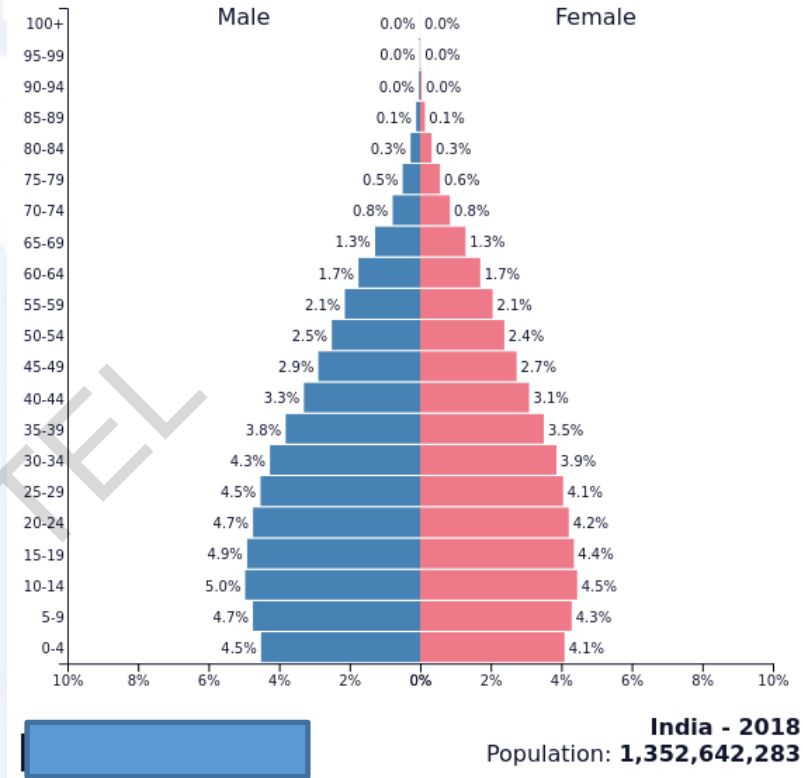
India ▼
2022

Population: 1,406,631,781



Elderly population----→

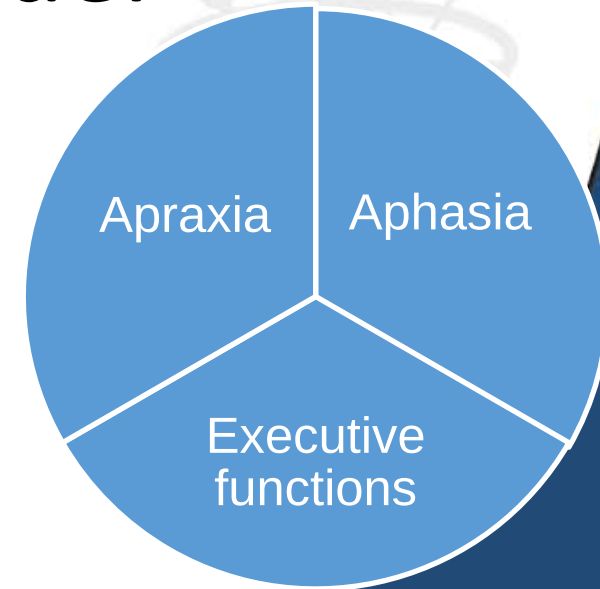
2018



1951--- 20 million
1991--- 57 million
2051- 324 million

Dementia : Neurodegenerative Disorder

- Decline in memory with impairment of at least one other **cognitive** function,
- This decline should represent a change from previous behavior; it should impair social and/or occupational functioning; and cannot be accounted for by other psychiatric conditions such as depression, other mood disorders or psychosis .



Cognition: Process of acquiring knowledge and understanding through **thought, experience**, and the **senses**.

attention, memory, knowledge, decision making, planning, reasoning, judgment, perception, comprehension, language, and visuospatial function.

Dementia : Umbrella Term

Classification: Dementia

Irreversible

- **Degenerative**

Mild cognitive impairment

Alzheimer's type

Dementia with Lewy bodies

Parkinson's disease dementia

Parkinson's plus syndromes

Vascular

Reversible

- Depression
- Medication induced
- **Metabolic**
 - Vitb12
 - Thyroid
 - Thiamine
 - Chronic diseases (renal,Liver,malignancy)

GI

Whipple

Pellagra

Infectious

HIV

Neurosyphilis

Classification: Anatomical

Cortical

Alzheimer's

Fronto-temporal

Subcortical

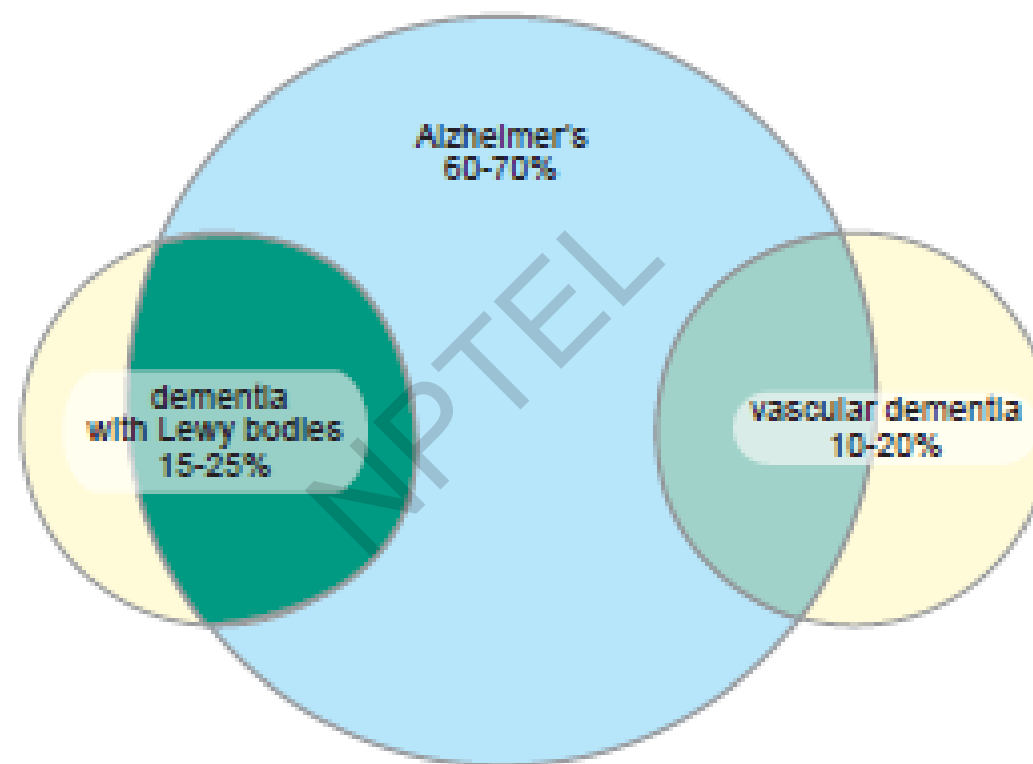
- Parkinson's Dementia
- Lewy body dementia
- Progressive supranuclear palsy
- Huntington disease
- Cortico basal degeneration
- HIV dementia

• Prion

Clinical reports suggest that subcortical syndromes (eg, Parkinson's disease) involve less severe intellectual and memory dysfunction and lack the aphasia, agnosia, and apraxia typical of the cortical dementias (eg, dementia of the Alzheimer type).



Mixed Dementia: Overlap of Alzheimer's Disease with Other Dementias



Alzheimer's Dementia (Clinical Features)

- Memory----deficits of **short---term memory followed by long---term memory deficit** later. Amnesia universal and is mainly for recent events. Disorientation is common, especially for time.
- Language: Expressive and receptive dysphasia, lexical anomia (**word---finding difficulty**)
- Apraxia
- Agnosia
- **Impaired visuospatial skills and impaired executive functions.**
- Behavioural and psychiatric symptoms (BPSD) are common in dementia.

“Attended With”
&
“Head turn over “

Apathy (59.6%) and depression (58.5%) were the most common abnormalities, irritability (44.6%), anxiety (44%) and agitation (41.5%).

The most common behavioural disturbance requiring intervention includes wandering and **aggression/ anger outbursts.**

Some patients exhibit **sexual disinhibition, incontinence, excessive eating and searching behaviour.**

Alzheimer's Dementia

Poor Prognostic factor



Being male
Onset before 65 years
Prominent behavioural problems
Parietal lobe damage
Observed depression
Severe cognitive deficits such as apraxia
Absence of misidentification syndrome

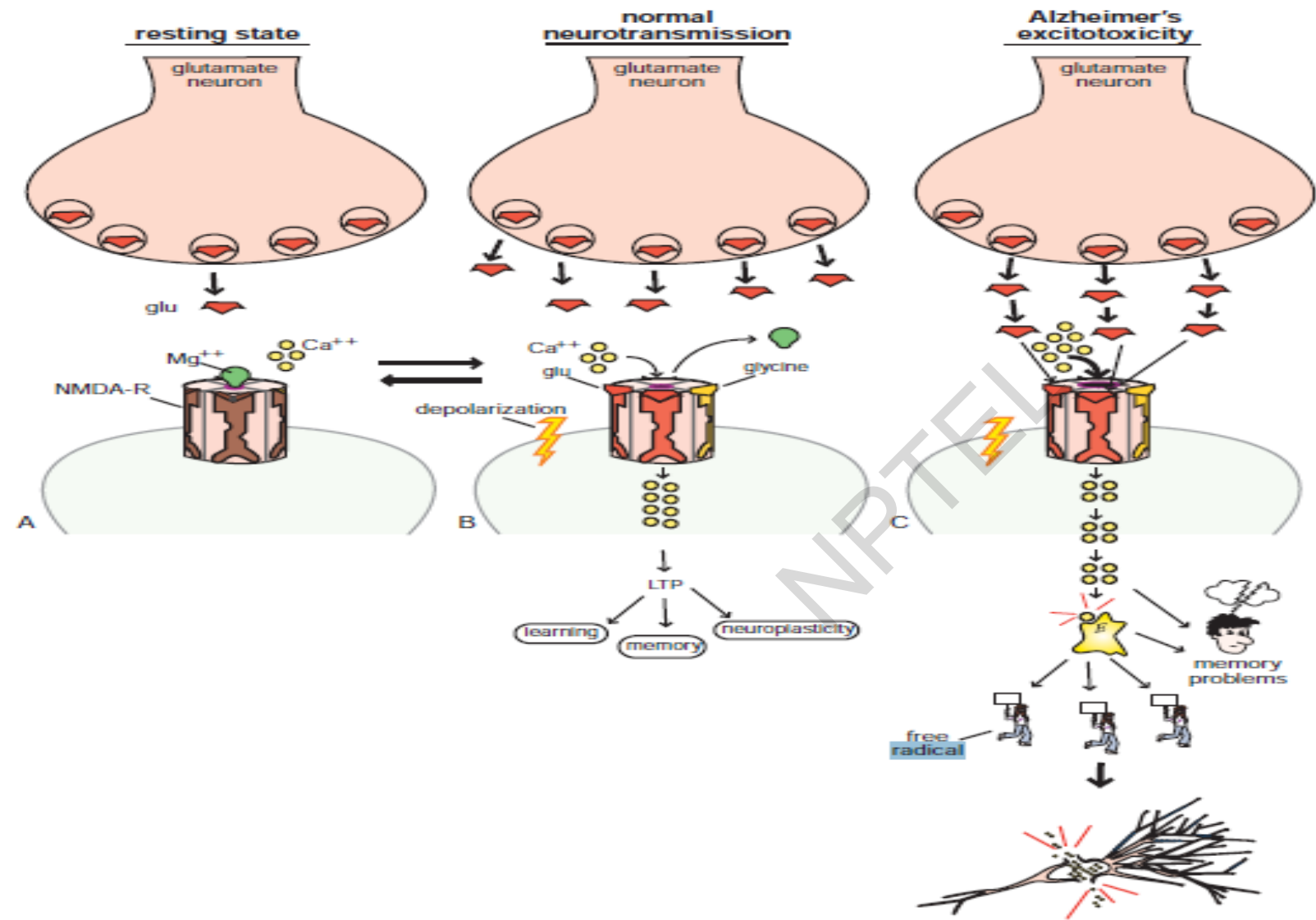
Risk Factors

- Proven: Age, Down's syndrome, Apolipoprotein $\epsilon 4$ allele
- Likely: Female sex, Head injury, postmenopausal oestrogen decline
- Possible: Family history of Down's syndrome, Family history of Parkinson's disease and vascular factors

Protective factors:

- Proven: Apolipoprotein $\epsilon 2$ allele
- Possible: smoking, NSAIDs, oestrogen, premorbid intelligence and education

- Generally progresses through three stages:
 - Early (mild) stage
 - Middle (moderate) stage
 - Late (severe) stage
- Early-stage symptoms:
 - Short-term memory lapses (e.g., difficulty recalling recent events and learning new information)
 - Difficulties with thinking, problem-solving, orientation, and/or language
 - Changes in mood (e.g., apathy, depression, irritability)
- Middle-stage symptoms:
 - Increased severity of memory loss, communication difficulties, reasoning problems, and orientation problems
 - Decreased awareness of surroundings (may get lost*)
 - Increased confusion
 - Delusions and/or hallucinations may occur
 - Agitation (e.g., restlessness or pacing), calling out, repetition of the same question, and/or disturbed sleep patterns may occur
- Late-stage symptoms:
 - Loss of memory can be very evident (including longer-term memory problems*)
 - Increased physical weakness (increased risk of falls*)
 - Language deterioration* and loss of speech
 - Paranoia may occur*
 - Restlessness and agitation may occur



Behavioural and psychological symptoms of Dementia (BPSD)

- A heterogeneous group of clinical phenomena is subjectively experienced by the patient and/or observable by an examiner (e.g., caregiver, physician) consisting in disturbed emotions, mood, perception, thought, motor activity, and altered personality traits.
- These “**Neuropsychiatric symptoms**,” according to the terminology most used in the **United States**,
- “**Behavioral and psychological symptoms of dementia**” (BPSD), as designated by **the International Psychogeriatrics Association**.
- There is an overall agreement that BPSD are very common regardless of the type of dementia and are present in virtually all patients during the course of their disease.

Reason for which family seeks treatment

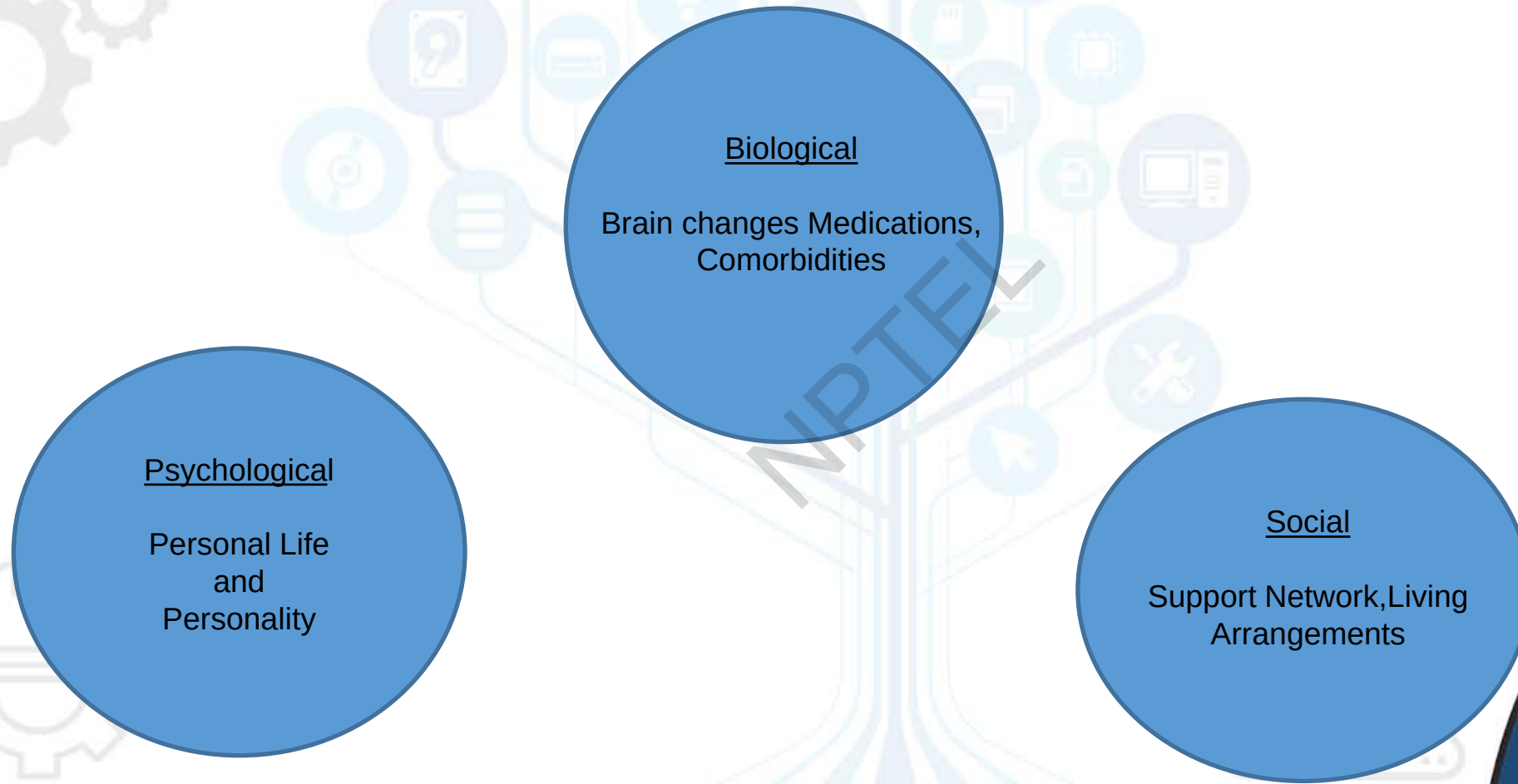
- Estimated rates of 35–85% in subjects with mild cognitive impairment.
- Depression/Apathy is usually the most common, which affects more than half of the patients.
- Prevalences of some BPSD have been varied:

Agitation 55.9%,	Delusion 41.2%–63.0%,	Hallucinations 21%–26%
Anxiety 35%–76%,	Sleep problems 26%–61%,	Apathy 70%

Apathy in Depression: Lack of motivation with Dysphoria
Apathy in Dementia: Lack of motivation without dysphoria

- Apathy- has been defined as a disorder of motivation with additional loss or diminished goal-directed behaviors, cognitive activities and emotions.
- Delusion: are less organized, involves abandonment and misidentification.
- Perceptual disturbances: any modality can occur, visual common
- Agitation has been defined as “inappropriate verbal, vocal, or motor activity that is not judged by an outside observer to result directly from the needs or confusion of the agitated individual .

Etiopathogenesis: BPSD



Psychotic

Delusion
&
Hallucination

Emotional

Agitation/Aggression
Depression, Dysphoria
Anxiety/Irritability

Behavioural

Euphoria/Elation
Apathy. Disinhibition
Aberrant motor behaviour

Canevelli et al. identified three clusters of symptoms.

- ❑ **Antipsychotics use should not be used routinely to treat agitation and aggression in people with dementia.**
- ❑ Only FDA approved drug for BPSD
Atypical antipsychotic Risperidone (0.25-2mg) with vital monitoring and ECG tracing (QT prolongation).
Aripiprazole (5-15 mg) can be tried.
- ❑ Mood Stabilizers are given to counter agitation but FDA not approved till now
- ❑ Antidepressants: SSRI in a low dose escitalopram (5-10 mg)
sertraline(25-50 mg).TCA's avoided.

BPSD Comparison

	Alzheimers	Vascular	DLB	Pick (FTD)
Frequency and severity of BPSD	Comparatively less than DLB		increased	
Disinhibition Causing Caregiver distress	Frequent		Not Frequent	Predominant
Hallucinations	Frequent			Frequent
Apathy	Frequent	Frequent	Frequent	Frequent
Agitation/Disinhibition	Frequent	-	-	-
Depression/anxiety		Frequent		

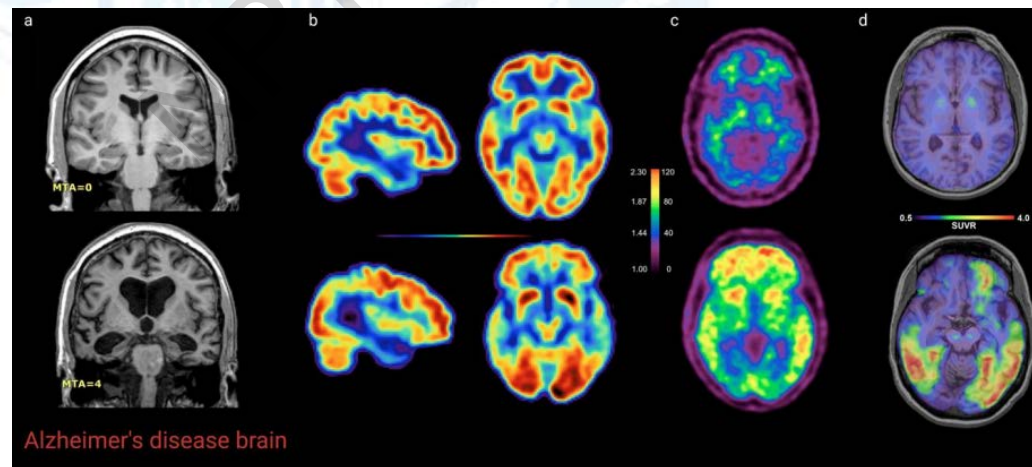
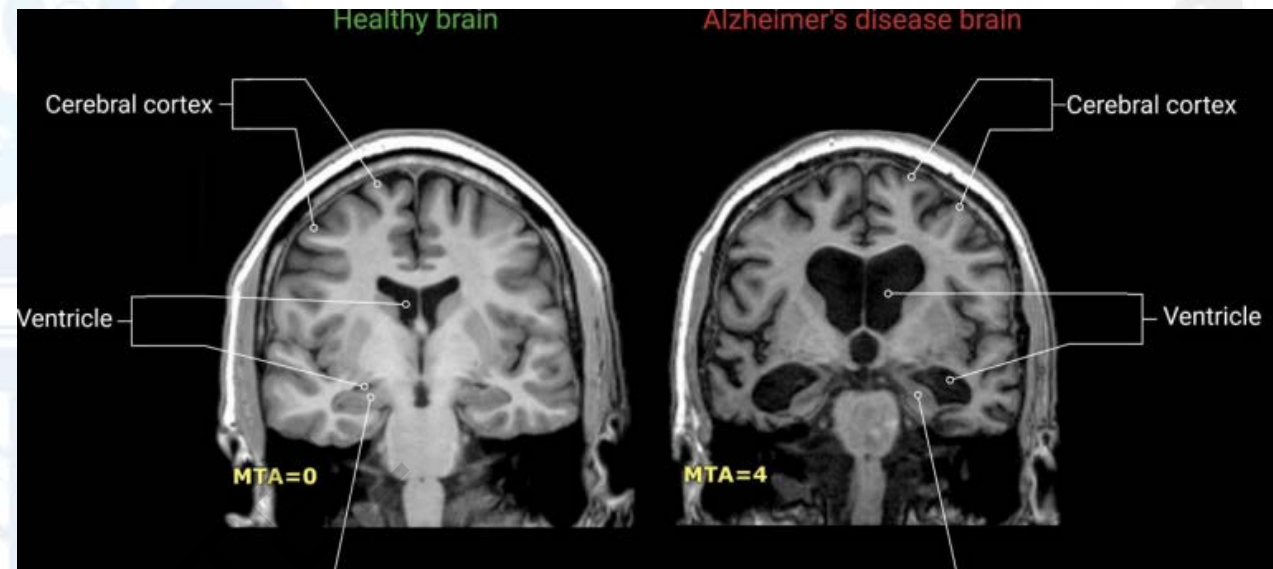
Differences of Behavioral and Psychological Symptoms of Dementia in Disease Severity in Four Major Dementias Hiroaki Kazui^{1*}, Kenji Yoshiyama¹, Hideaki Kanemoto¹, Yukiko Suzuki¹, Shunsuke Sato¹,

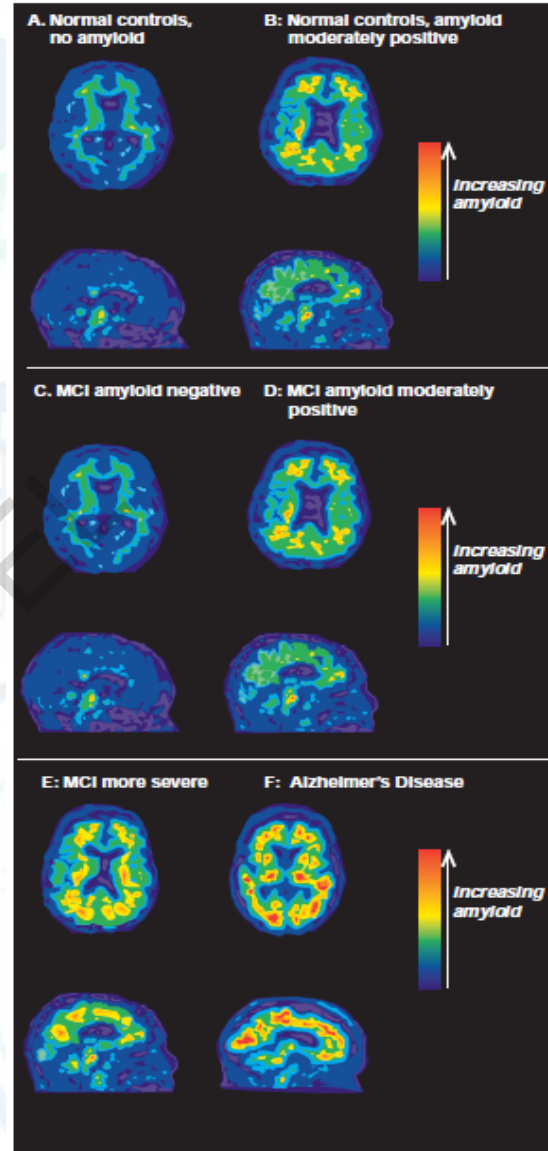
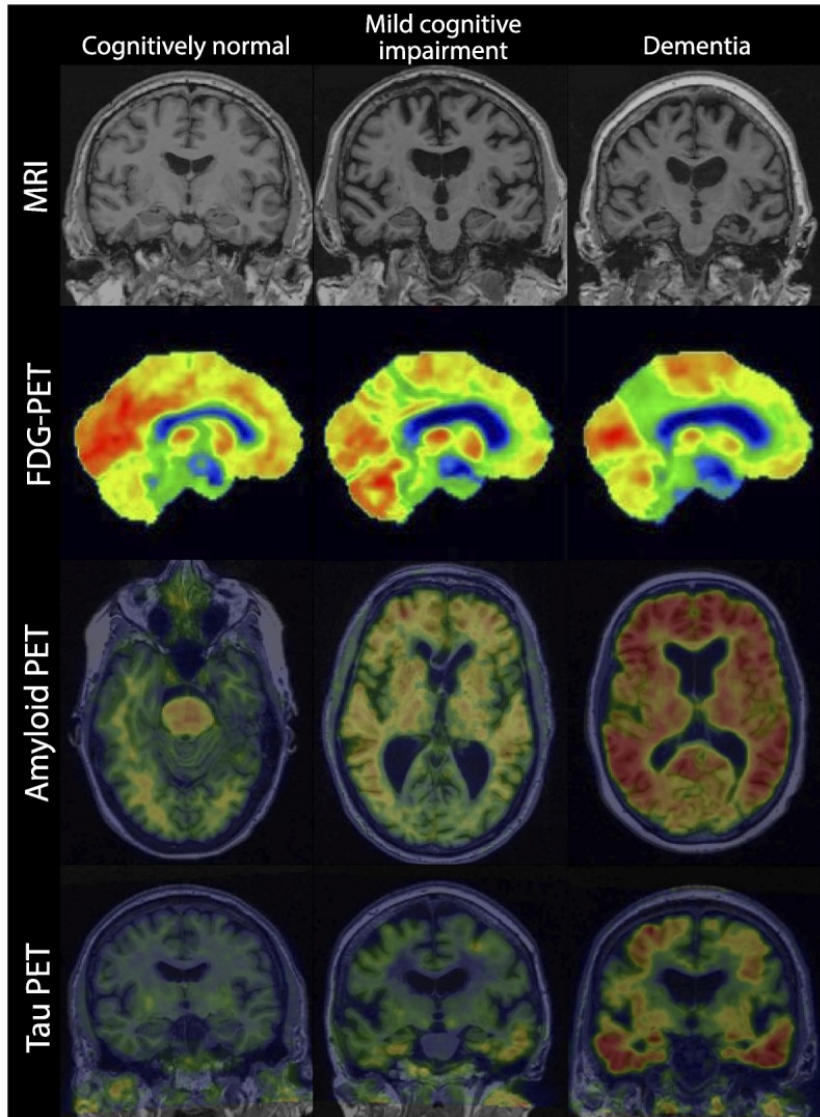
Manabu Hashimoto¹, Masaharu Ikeda^{1,2}, Hibiki Tanaka², Yutaka Hatada², Masateru Matsushita², Yoshiyuki Nishio³, Etsuro Mori³, Satoshi Tanimukai^{4,5}, Kenjiro Komori^{4,6}, Taku Yoshida⁴, Hideaki Shimizu⁴, Teruhisa Matsumoto⁴, Takaaki Mori⁴, Tetsuo Kashibayashi^{1,7}, Kazumasa Yokoyama⁷, Tatsuo Shimomura⁸, Yasunobu Kabeshita^{1,9,10}, Hiroyoshi Adachi^{1,9,10}, Toshinisa Tanaka¹ Family caregivers of people with dementia

Henry Brodaty, MD; DSc; FRACP; FRANZCP)

- In CT scans, cortical atrophy especially over parietal and temporal lobes, dilatation of the third ventricle which correlates with cognitive impairment (most common picture)
- MRI: Reduced grey matter, hippocampus, Amygdala and temporal lobe volumes
- SPECT: Characteristic reduction in blood flow in temporal and parietal regions (SPECT could distinguish specific features of dementia of Alzheimer type at early stages and frontal lobe dementia).
- PET: Reduced blood flow and metabolism in temporal and parietal regions
- MRS: Abnormal synthesis of membrane phospholipids early in the disease
- Amyloid PET imaging – shows deposition of beta amyloid even in preclinical stages of dementia

Assessment of the cortical thickness is believed to be a useful biomarker in the early diagnosis of AD (disease signature).





Differential Diagnosis



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- **Clinical diagnosis of Dementia can only be diagnosed in absence of Delirium .**



Acute decline in both consciousness and cognition with impairment in attention

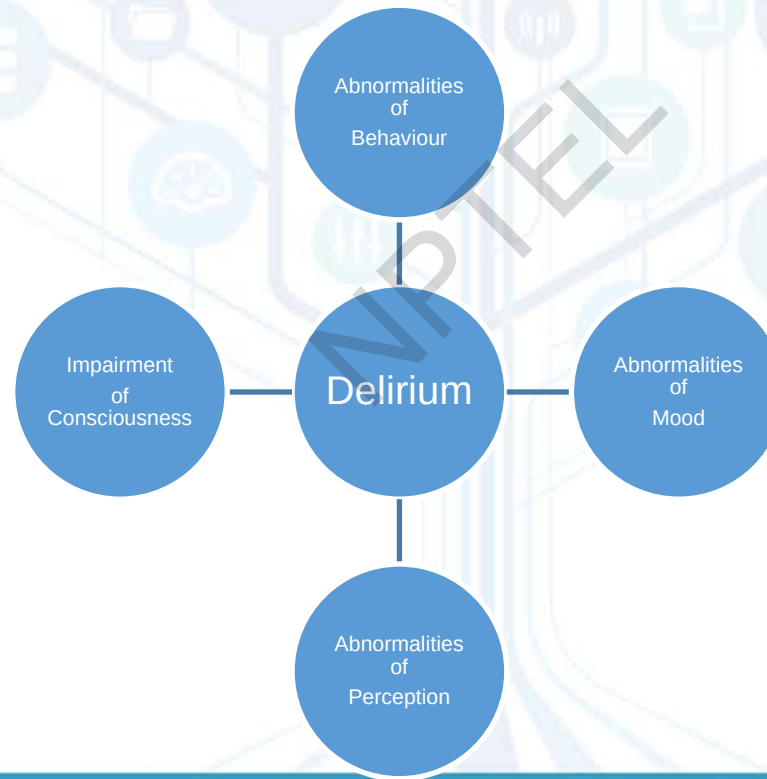
- Delirium, dementia, and depression are related in different ways.
- Although these three conditions are different, **they can occur at the same time.**
- **They share common features with overlapping symptoms.**
- **Delirium can be mistaken for depression. Delirium can be mistaken for behavioural and psychological symptoms of dementia (BPSD).**
- Dementia can be mistaken for depression, or depression can be mistaken for dementia.
- **Having one of the three conditions can increase the risk of a person developing one of the other conditions**
- Health-care providers must be able to differentiate the three conditions in order to refer to appropriate clinicians, teams, or services for further assessment and diagnosis.

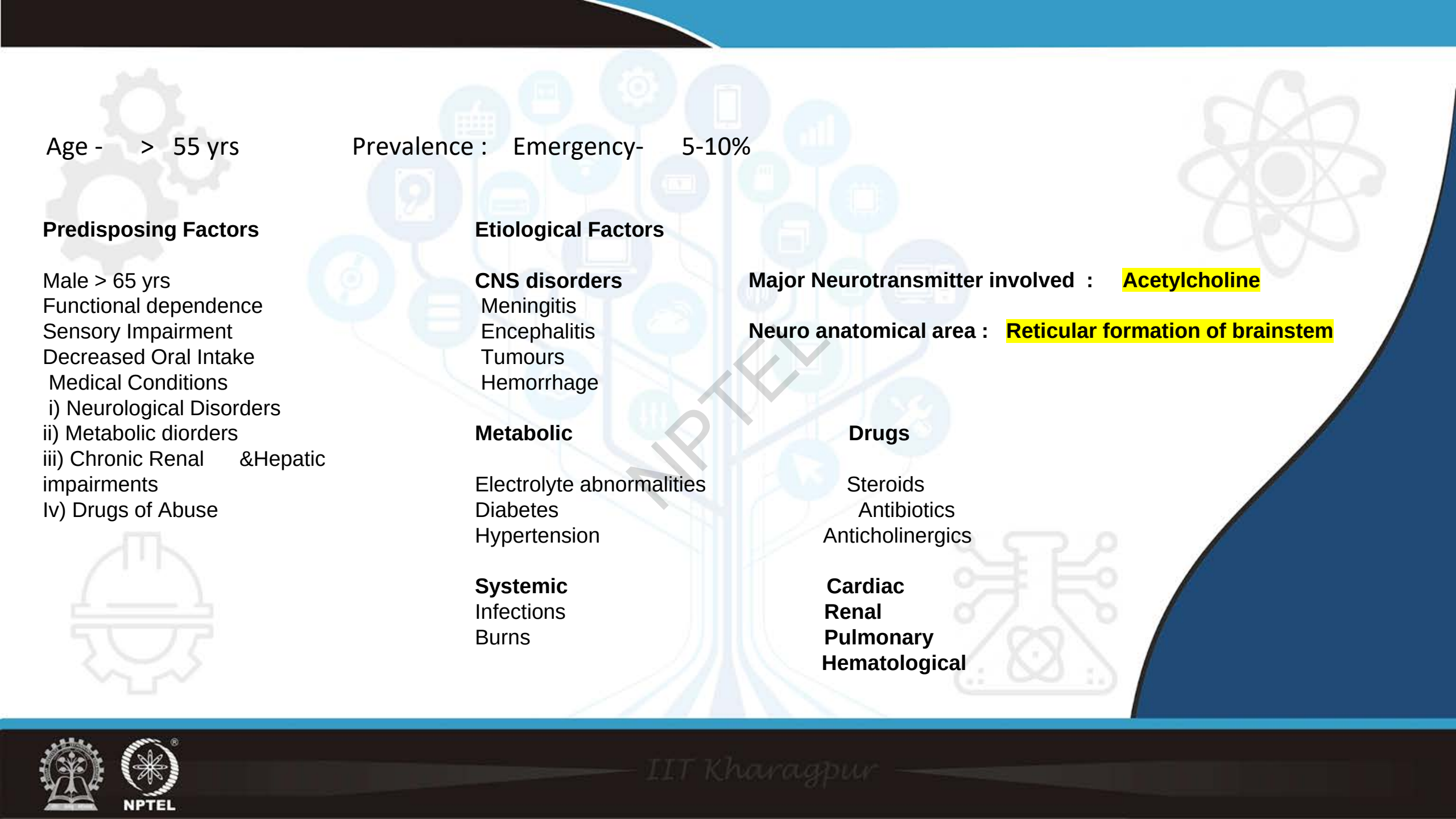
Hyperactive Delirium – BPSD
Hypoactive Delirium-Depression

Delirium/Brain Failure/Organic Brain Syndrome /ICU Psychosis

Acute decline in both the level of consciousness and cognition with particular impairment in attention.

Hallmark symptom of delirium





Age - > 55 yrs

Prevalence : Emergency- 5-10%

Predisposing Factors

Male > 65 yrs
Functional dependence
Sensory Impairment
Decreased Oral Intake
Medical Conditions
i) Neurological Disorders
ii) Metabolic disorders
iii) Chronic Renal & Hepatic impairments
iv) Drugs of Abuse

Etiological Factors

CNS disorders

Meningitis
Encephalitis
Tumours
Hemorrhage

Metabolic

Electrolyte abnormalities
Diabetes
Hypertension

Systemic

Infections
Burns

Major Neurotransmitter involved : **Acetylcholine**

Neuro anatomical area : **Reticular formation of brainstem**

Drugs

Steroids
Antibiotics
Anticholinergics

Cardiac

Renal
Pulmonary
Hematological

Treatment

- Physical support to the delirious patient
- Patient Should be neither sensory deprived / nor overstimulated. Usually helped by having a friend or family close by to reorient them.
- **Two major symptoms** which require **intervention** is **Psychosis and Insomnia**.
- Antipsychotics preferentially haloperidol is given for psychosis, care should be taken regarding QT prolongation which adds to its deleterious side effect.
Atypical antipsychotics like risperidone, olanzapine, aripiprazole can also be given.
- Benzodiazepines are given for insomnia

Vascular Dementia

- Second most common cause of dementia after Alzheimer's disease.
- 20% of cases
- NINCDS----AIREN criteria requires evidence

Cerebrovascular disease on both **examination** and on **brain imaging** and a relationship between the onset of dementia & cerebrovascular disease By

- a) Dementia occurring within 3 months of a stroke or
- b) Abrupt deterioration in cognitive function or fluctuating stepwise course.
- **Cerebral Autosomal dominant arteriopathy with subcortical infarcts and Leukoencephalopathy is a Vascular form of Dementia.**

Imaging in vascular dementia:

CT: Increased number of infarcts

MRI: White matter lesions are more numerous and severe in Alzheimer's disease

SPECT: Irregular perfusion deficits

PET: Cerebral blood flow and metabolism reduced and uncoupled

MRS: Absence of phospholipids changes allow differentiation from Alzheimer's disease

Comparison

Alzheimer's

- Females more affected than males
- Onset – insidious
- Gradual progressive course
- Focal neurological signs absent
- Insight often lost
- Mood flattened or euphoric
- Somatic complaints uncommon
- Vascular risk factors less likely to be present

Vascular

- More common in males
- May be sudden onset
- Stepwise course
- Focal neurological signs present
- Insight often retained
- Mood symptoms are uncommon
- Somatic complaints reported frequently, eg dizziness and headaches
- Vascular risk factors more common

Fronto-temporal Dementia

- Younger population 40 -75 yrs
- Personality (disinhibition,lack of insight)
- Behaviour
- Fronto-temporal (impulsivity,lability,executive dysfunction,hyperorality).
- Memory involvement later ,spatial orientation well preserved
Insight lost early.
- 10 % associated with Motor neuron disease which has more aggressive course of illness.
Selective Serotonin Reuptake Inhibitors limited benefit.

Diagnosis

Neuropsychology: Impairment in Abstract thinking, spared memory , speech perceptuo -spatial functions

SPECT : regional cerebral blood flow decreased with decreased glucose metabolism in frontal areas.

Lewy Body Dementia

- Lewy Body Dementia (LBD) ---- accounts for 15----20% of cases of dementia.
- **The central feature** : progressive cognitive decline of sufficient magnitude to interfere with normal social or occupational function.

Core features include 2-probable diagnosis 1- possible diagnosis.

- **Fluctuating cognition with profound variations in attention and alertness**
- **Recurrent visual hallucinations----**that are typically well formed and detailed
- **Spontaneous motor features of parkinsonism (seen in 70% of cases)**

Supportive features

- Repeated falls due to autonomic dysfunction
- Syncope
- Transient disturbances of consciousness
- Neuroleptic sensitivity
- Systematized delusions
- Hallucinations in other modalities

PDD: If the parkinsonian symptoms have existed for more than 12 months before dementia develops then a diagnosis of Parkinson's disease dementia is given

- 50% of individuals experience life threatening adverse effects to antipsychotics.
- Medial temporal lobes relatively preserved in SPECT----HMPAO scan

Parkinson's disease Dementia

- Prototype of subcortical Dementia
- Structures affected are Basal Ganglia (Caudate, Globus Pallidus, Putamen).
- **3 M's Mood, Mentation, movement.**
- Bradyphrenia- Slowed Thinking.
- 10 % gradually develop dementia ever year.
- Executive functions commonly affected like Planning, reasoning, sequencing.
- Visual and verbal memory deficits less severe than Alzheimer's.
- Alexia , Agraphia , Anomia , Acalculia,
- Impaired Quality of life, caregiver stress, doubles mortality, due to motor burden.
- Rx- clozapine 25- 50 mg
Quetiapine may be tried
Rivastigmine Licensed for Parkinson's disease Dementia

LBD: If both motor symptoms and cognitive symptoms develop within 12 months, then it is conventional to give a diagnosis of Lewy body dementia.

Parkinsonism with Psychosis: Pimavanserin (FDA approved)

Investigation

- Blood test:
 1. Complete blood counts (CBC)
 2. Liver Function test (LFT)
 3. Kidney Function test & Serum electrolytes (KFT)
 4. Thyroid assay
 5. Vit b 12
 6. Test of Infective etiology (syphilis, Epstein Bar, Neurocysticercosis AIDS)

Psychological Assessment:

Gold standard for evaluating BPSD:
Neuropsychiatric inventory (NPI)
Behavioural Pathology In Dementia (BEHAVE-AD)
Cohen-Mansfield Agitation Inventory (CMAI)

- For MCI due to (AD) Alzheimer's Dementia

Currently **two main sets of biomarkers** can help in formulating this clinical judgment:

a) **Biomarkers of amyloid-beta ($A\beta$) deposition** → CSF $A\beta_{42}$, PET Amyloid Imaging

b) **Neuronal injury**.-→

FDG PET, SPECT Imaging, Rate of Atrophy, Hippocampal volume, csf TAU

CONCLUSIONS

-In this lecture We have discussed regarding concepts of dementia, its various types
Differentiate between Delirium , Geriatric Depression , Dementia and its characteristic features

REFERENCES

- 1 Oxford Text book Of Psychiatry
- 2 Comprehensive Text book Of Psychiatry (Kaplan & Sadock)
- 3 Text book Of psychiatry (Tasman & Leiber mann)
4. Delirium/Acute confusional state/Acute brain syndrome/Acute cerebral insufficiency/Toxic-Metabolic Encephalopathy- Morandi et al.
- 5.Attended with and head-turning sign can be clinical markers of cognitive impairment in older adults
J C Williamson, A J Lerner
6. Stephan stahls psychopharmacology



**THANK
YOU !**



NPTEL ONLINE CERTIFICATION COURSES

Course Name Basics Of Mental Health & Clinical Psychiatry
Faculty Name Dr Sumit Kumar
Department Name Psychiatry
TATA MAIN HOSPITAL

Lecture 25 : Neurocognitive Disorders-II

CONCEPTS COVERED

- Concepts of Dementia , Delirium , Geriatric depression
- Cases Vignette 1
- Case Vignette 2
- Case Vignette 3
- Management of Dementia (Pharmacological + Non Pharmacological)

Neurocognitive disorders - II



NPTEL



Case Vignette

Mr X 78 yr old male married with 1 son owns a business(flower shop).He was brought by his son for the treatment to a hospital.

when Mr B was in his 60's their son started noticing misplacing tools, losing paper orders and forgetting important pick up timings , At home Mr B had problems in remembering names of the family members, could fumble during marketing ,many a times he used to ask repeatedly the names of the house hold articles to be brought which was not present 6 months back and making payments in bills,he used to forget after taking meals that he has eaten and would ask again complaining he has not given the food for the day, twice he was observed with burst of laughter when he could not answer his customers for payments ,often wake up at odd hours in night telling its time to open shop eventually becoming irritable at home and shop.

When MR B turned 70 yrs old family decided to sell business as he was having difficulties related to social relatedness, repeated questions after reassurances ,he used to get lost and were brought by neighbours because he failed to remember his postal address , on several instances there were suspiciousness towards family members doubting that his spouse has been replaced by other person , multiple complaints regarding stolen articles which belongs to him attributing the theft towards family members ,with elaboration of visual images that he could see persons who are dead walking beside him ,disturbed sleep –wake cycle.

When Mr B turned 75, he could not remember his date of marriage , when asked about his work he could not remember what was the profession?? not able to dress himself wear his clothes , eat food , repeated falls , denies recognizing himself in the mirror with severity in paranoia , myalgia weakness , physically frail along with medical comorbidity which was associated restlessness ,agitation and aggression eventually becoming dependant on caregiver (spouse).On interviewing MrX used to turn and gaze towards his son for the answers.

Discussion: Mr X

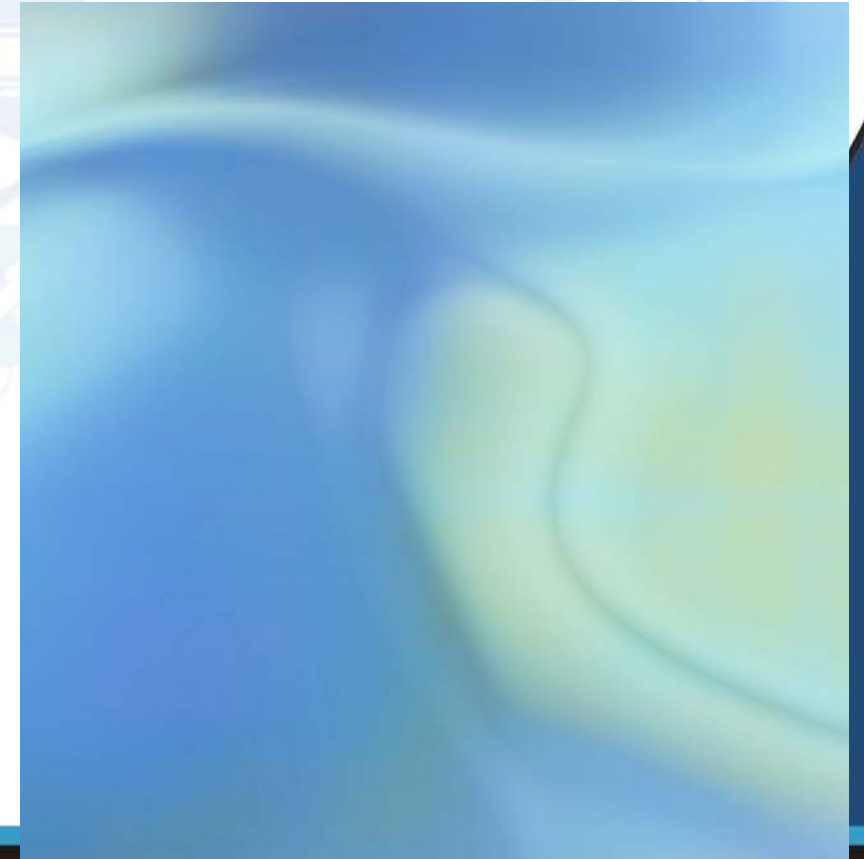
SI No	Signs	Symptoms
1.	Forgetfulness	He was not able to remember timings of the deliveries along with house related work.
2.	Poor Comprehension and Dyscalculia	Not able to perform arithmetic calculations at job during payments, neither he could communicate with customers at shop.
3.	Lexical anomia	He used to forgets names of the family members as well as friends
4.	Dressing Apraxia	Not able to wear dress correctly.
5.	Catastrophic Reaction	(Pathological laughter) He used to laugh at some point in the conversation wherein it is difficult for him to answer questions simply to ignore or deviate from questions being put forward
6.	Bpsd (Delusion & Hallucination)	are hiding my possession and are making plot against me. He could see dead people around him walking (Capgras)
7.	T.V sign, magazine sign, mirror sign	Perceiving real world images of self, in television and magazine

Case 2

Mr Y 76 yr old male, appears perplexed , day after surgery to repair broken hip which resulted after a fall. The neighbour who brought him stated ,he was reclusive in recent years after wifes death 6 months earlier able to function independently . There were liquor bottles which were collected from the apartment where Mr A used to live.

Laboratory values were s/o increased BUN, low albumin with increased BP 160/100, In addition to medications he had received 2mg of haloperidol after a bout of agitation.

The team which assessed him where of opinion that he answers absurdly, with irrelevant answers, disoriented to place and time, not making any sense at all. Mr A was constantly complaining of insects crawling over the skin & scratching all over the body. On further clarification it was found out there was history of alcohol dependence in Mr A.



Discussion : Mr Y

Anatomical area Reticular
Formation of Brain stem and
Dorsal tegmental pathway
locus ceruleus

Reticular
Formation:-
controls attention
and arousal-

Altered
consciousness

Disorientation

Rapid onset of
symptoms

Visual and Tactile
hallucination

Alcohol withdrawal

Autonomic Arousal
(rise in
BP, diaphoresis)

Weight loss (low
Albumin, anorexia)

Rx: benzodiazepines (Lorazepam)

Antipsychotics

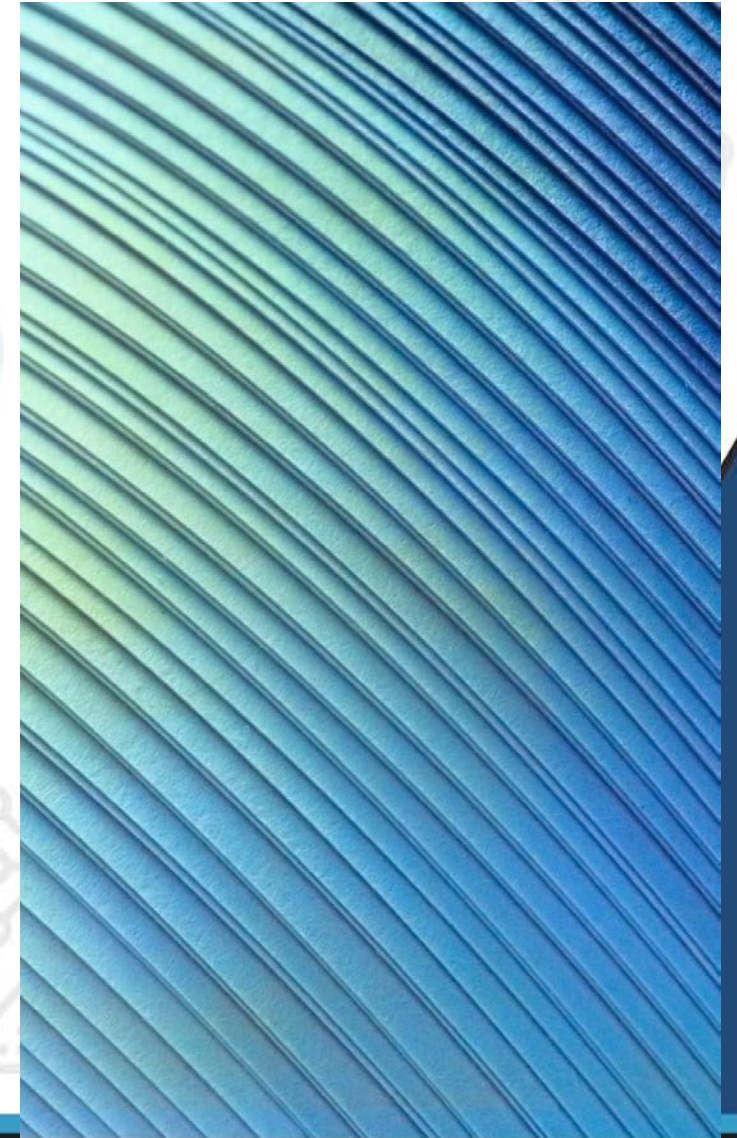
Thiamine

Case 3

Mrs Z 67 yrs old female appears gloomy, sulky, with loss of interest in pleasurable activities, depressive ruminations that it was because of her mistakes that her husband died , difficulty concentrating in various tasks, fatigueability on minimal work at home, decreased memory, disturbed sleep, loss of appetite 1 year following the demise of her spouse.

She now spends most of her time in bed thinking that she wont survive with feelings of hopelessness and helplessness , completely isolating herself from the rest of her family tried to end her life twice by consuming medicines prescribed to her by the family physician.

She is suffering from CHD, hypertension which further adds on to her misery .On interviewing Mrs X becomes extremely irritable on asking simple answers during mental status examination , although conscious and oriented and coherent for the session . She would most of the time refuse to answer deliberately with “ I don't Know” expression even though she knows the answers.



Discussion: Mrs Z

Neurotransmitter involved :
Serotonin, Dopamine, norepinephrine.

Anhedonia-loss of interest in life

Ruminations – focused attention on one distress and its consequences

Anatomical Area :
striatum, thalamus, and prefrontal cortex involved in emotional and cognitive processing.

Guilt – blaming herself for the death of his spouse.

Fatigueability- tired in doing very light amount of work

Suicidal ideation- intent and lethality

- **S-----Sleep Difficulty**
- **I-----Interest Deficit**
- **G-----Guilt**
- **E-----Energy deficit**
- **C-----Concentration Deficit**
- **A-----Appetite**
- **P-----Psychomotor Retardation**
- **S-----Suicidality**

Cognitive impairment
which improves with Antidepressants or when Depression is treated

Rx : Antidepressants

Clinical complaints: Depression vs Dementia

Depression

Mr Z

- Family aware of the dysfunction
- Rapid progression of symptoms.
- History of psychiatric dysfunction present.
- Patient themselves complaints of memory loss.
- Patients emphasis with elaborate details.
- Affective change pervasive.
- Behaviour incongruent with cognitive function.
- Attention and concentration often preserved well .
- Don't Know answers

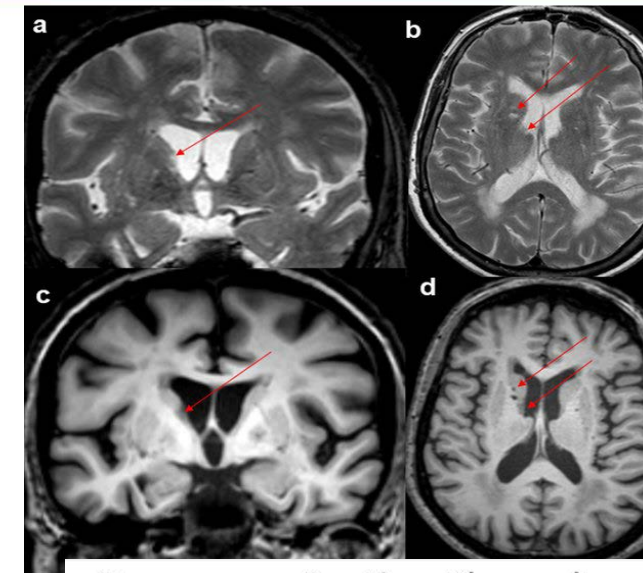
Dementia

Mr X

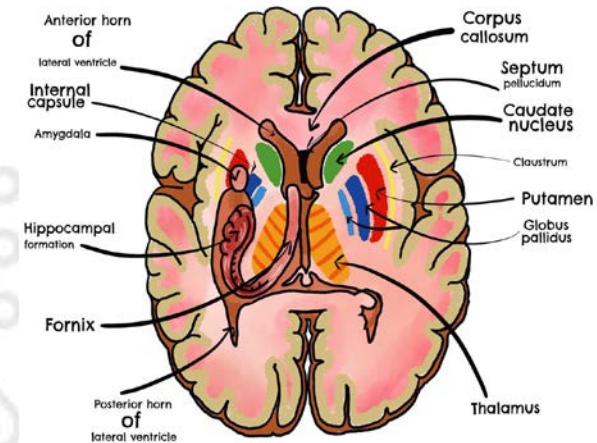
- Family often unaware of dysfunction
- Slow gradual .
- Previous psychiatric history not present
- Little or no complaints (Anosognosia)
- Patients usually conceal.
- Affect labile and shallow.
- Behaviour compatible with cognitive function.
- Attention and concentration impaired.
- Near miss answers

Radioimaging

- Neuroimaging findings in **LLD overlap with other diseases of aging, including Alzheimer's disease** and cerebrovascular disease
- **Central and cortical atrophy** have been widely reported on both CT and MRI
- Both the **hippocampus** bilaterally and the **amygdala** core nuclei **bilaterally** showed **reduced volume** in depressed
- LLD is also associated with **reduced frontal lobe volume**
- Recently volumetric studies have identified differences between early versus late-onset LLD , with **the late onset** showing less **frontal and more temporal and parietal atrophy..**
- fMRI :- reduced **CBF** bilaterally in the dorsal anterior cingulate and the hippocampus



Transverse Section Through Brain



University of Southampton

Epidemiology

- Patients suffering from Alzheimer's Dementia having Depression- **33.2%**.
- Percentage of Depression in Alzheimer's Dementia is **-30 %**.
- Delirium/Acute confusional state/Acute brain syndrome/Acute cerebral insufficiency/"Toxic-Metabolic Encephalopathy" - 10-31% on admission

Intensive care units- 80%

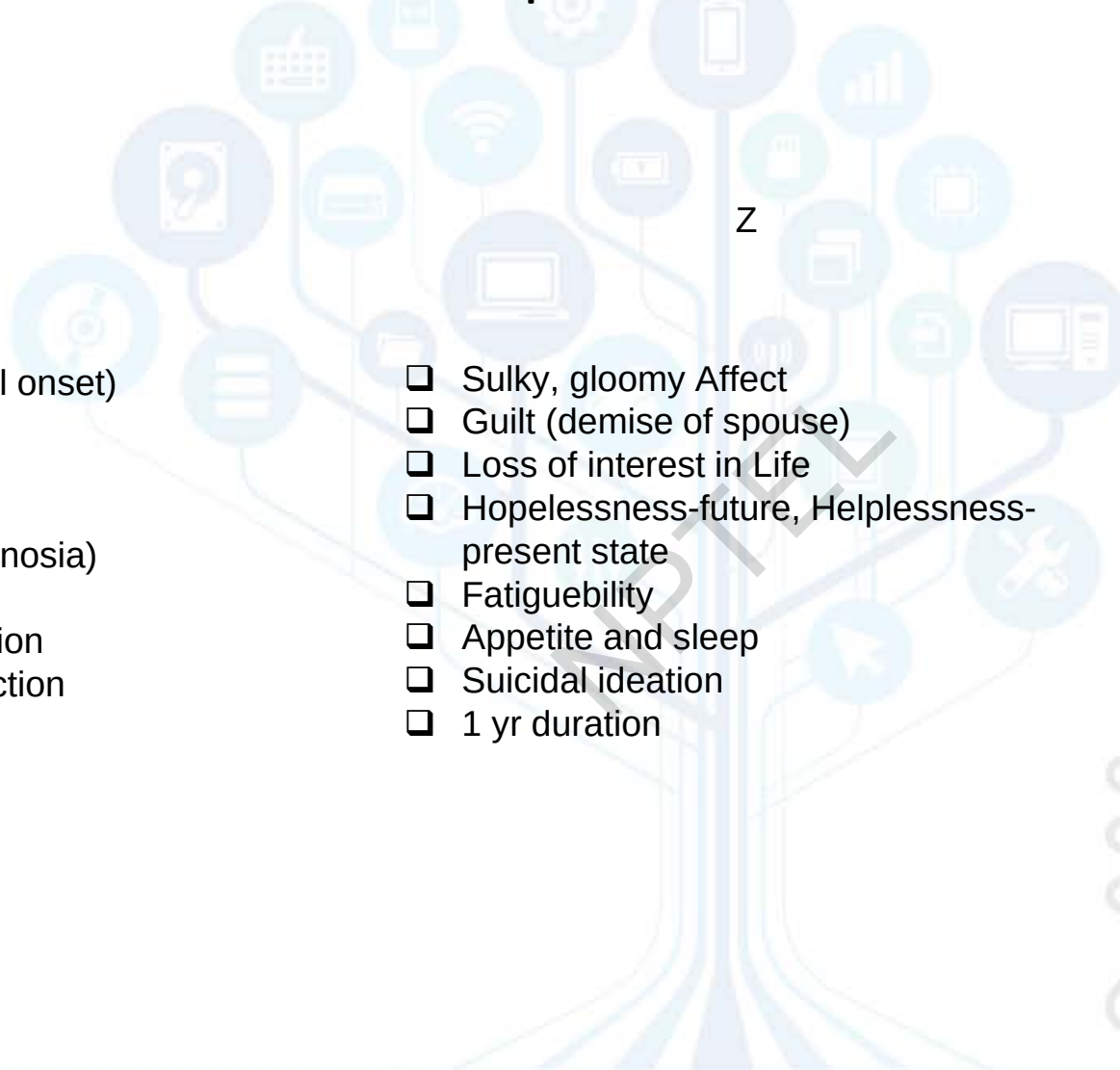
Palliative care units- 85%

Recapitulation of Cases



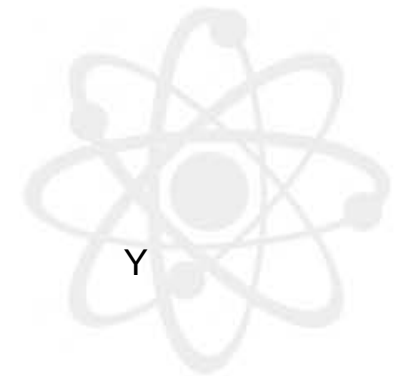
X

- ☐ Amnesia (gradual onset)
- ☐ Apathy
- ☐ Depression
- ☐ Nominal Aphasia
- ☐ Agnosia (Anosognosia)
- ☐ Dressing Apraxia
- ☐ Psychosis ,agitation
- ☐ Catastrophic reaction



Z

- ☐ Sulky, gloomy Affect
- ☐ Guilt (demise of spouse)
- ☐ Loss of interest in Life
- ☐ Hopelessness-future, Helplessness-present state
- ☐ Fatigueability
- ☐ Appetite and sleep
- ☐ Suicidal ideation
- ☐ 1 yr duration



Y

- ☐ Perplexed Affect
- ☐ Hip surgery
- ☐ AdLs maintained
- ☐ Acute onset confusion
- ☐ Low albumin increased BP
- ☐ Haloperidol Rx
- ☐ Alcohol Dependence



SI No	Feature	Delirium	Depression	Dementia
1.	Onset	Acute	Variable	Insidious, Chronic
2.	Course	Short, fluctuating	Diurnal worse in the morning	Long progressive
3.	Duration	Typically short hrs to less than a month	2 weeks	Months- yrs
4.	Alertness	fluctuation	normal	Normal -until late stages
5.	Attention	Fluctuation distraction	Minimum impairment, poor concentration	Normal Until progression of disease
6.	Orientation	Fluctuation	Mostly intact	Increasing impairment over time
7.	Memory	Recent memory affected	Recent memory affected	Recent memory affected Long term memory affected with progression of illness
8.	Thought	Incoherent, Rambling, Disorganized	Hopelessness, helplessness, guilt	
9.	Perception	Acute onset, hallucinations	In Severe cases Depression with psychotic features	Can occur with Dementia with lewy bodies/late stages of Alzheimer's

Pharmacological Management

NPTEL

Tacrine



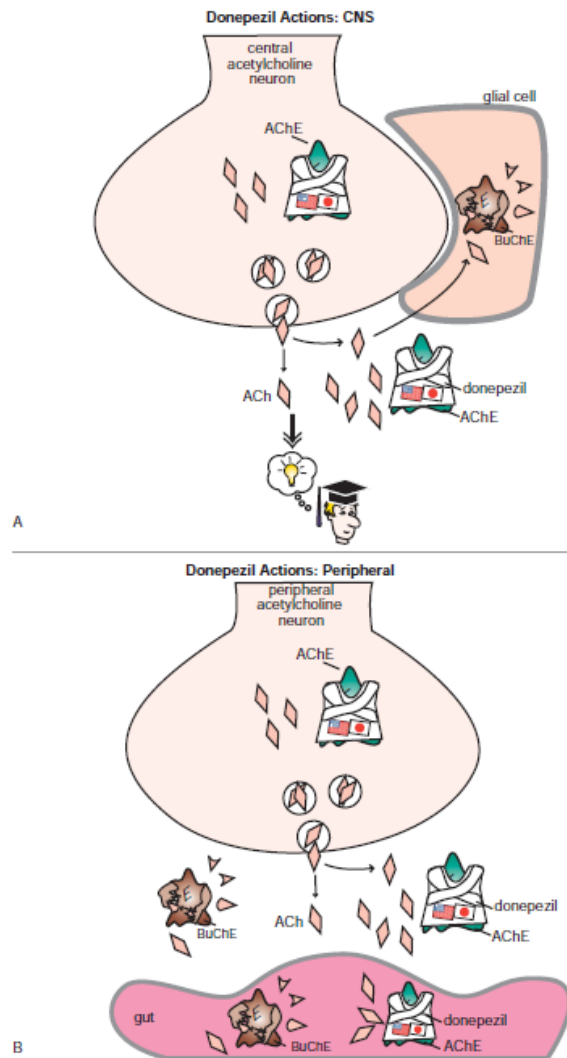
(Tetrahydroaminoacridine)

was the first FDA (Food and Drug Administration)-approved cholinesterase inhibitor drug for the treatment of AD

Acts by increasing ACh in muscarinic neurons

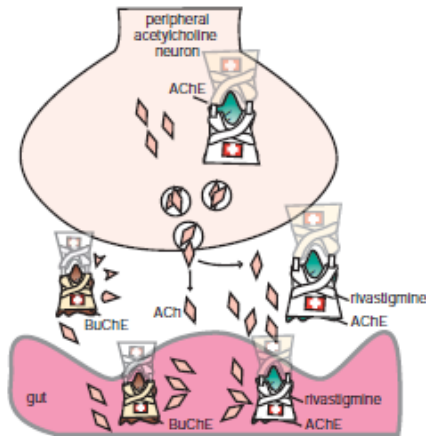
Exited the market immediately due to a high incidence of side effects like **hepatotoxicity**.

Donepezil (Selective +Reversible)

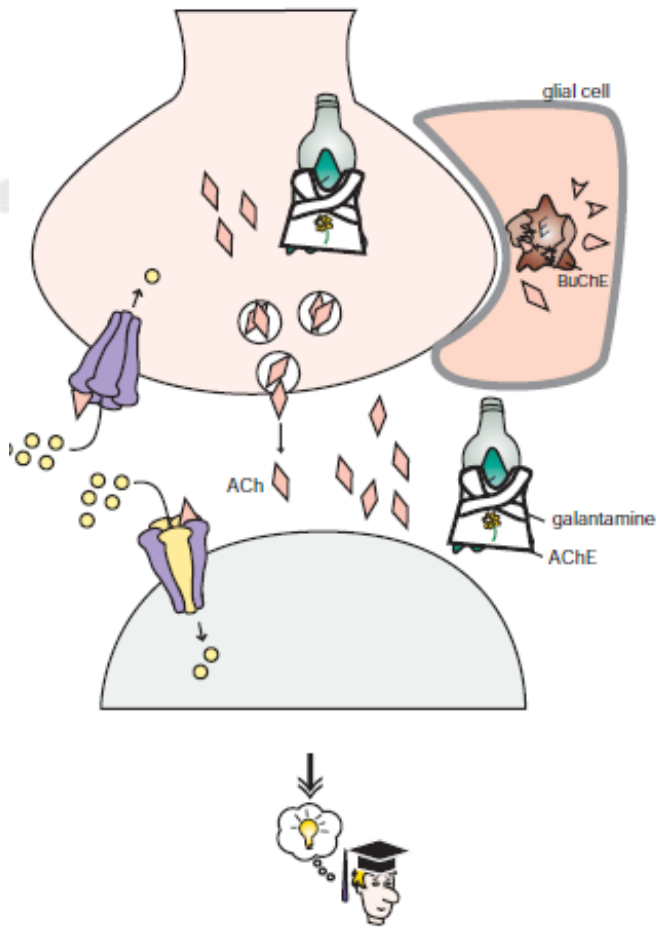


- Donepezil is an **indanone benzylpiperidine** derivative and a second generation of AChEIs and is considered the leading drug for AD treatment.
- Donepezil binds to **Acetylcholinesterase reversibly** and inhibits acetylcholine hydrolysis, which leads to a higher concentration of ACh at the synapses.
- The drug is given in **mild –moderate cases**
- Well-tolerated with mild and transient cholinergic side effects which are related to the gastrointestinal and nervous systems.
- Dose- 5-10 mg(Sustained Release formulation upto 23 mg available but when given above 10 mg :- GI side effects increases)

- Rivastigmine is a **pseudo irreversible inhibitor** of AChE and butyrylcholinesterase (BuChE)
- Acts by binding to the two active sites of AChE (anionic and esteric sites), which results in preventing ACh metabolism.
- The drug is used in mild to moderate AD cases.
- **Side effects include-** nausea, vomiting, dyspepsia, asthenia, anorexia, and weight loss.
- Dose- 3-6mg twice daily/9.5mg per 24 hrs patch



Galantamine Actions

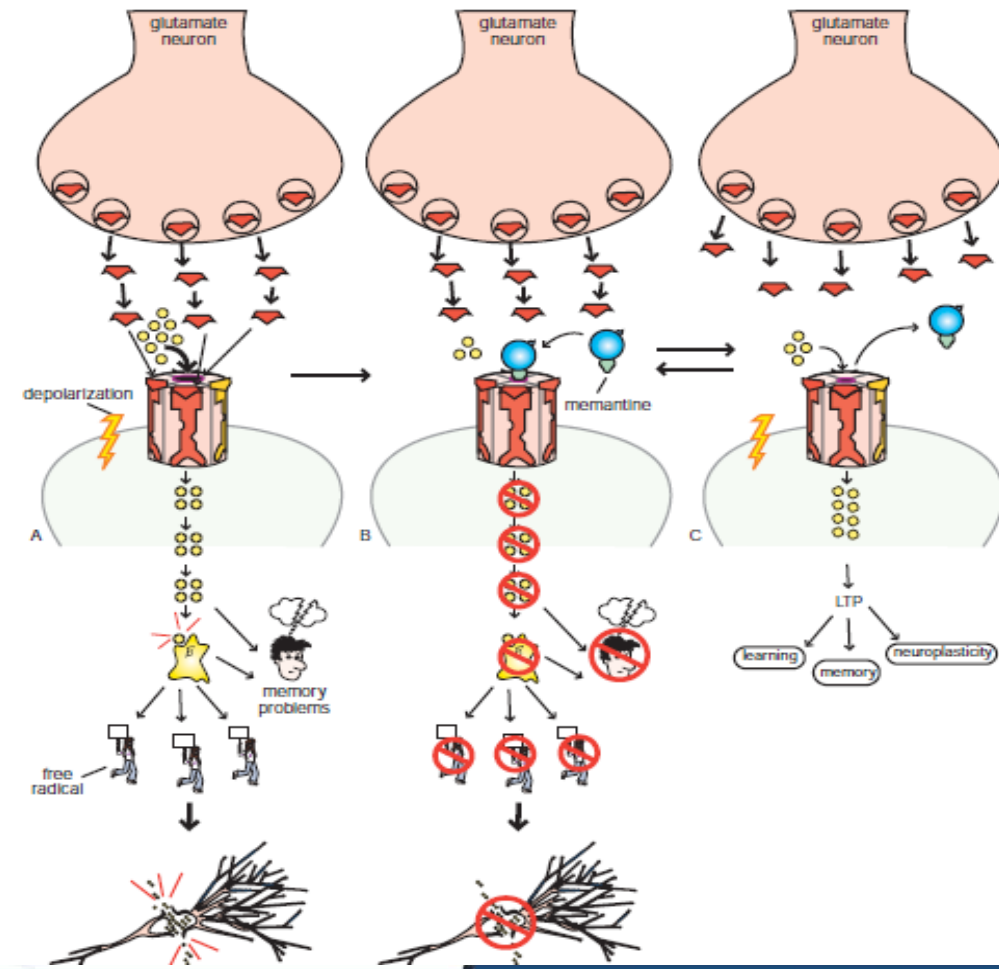


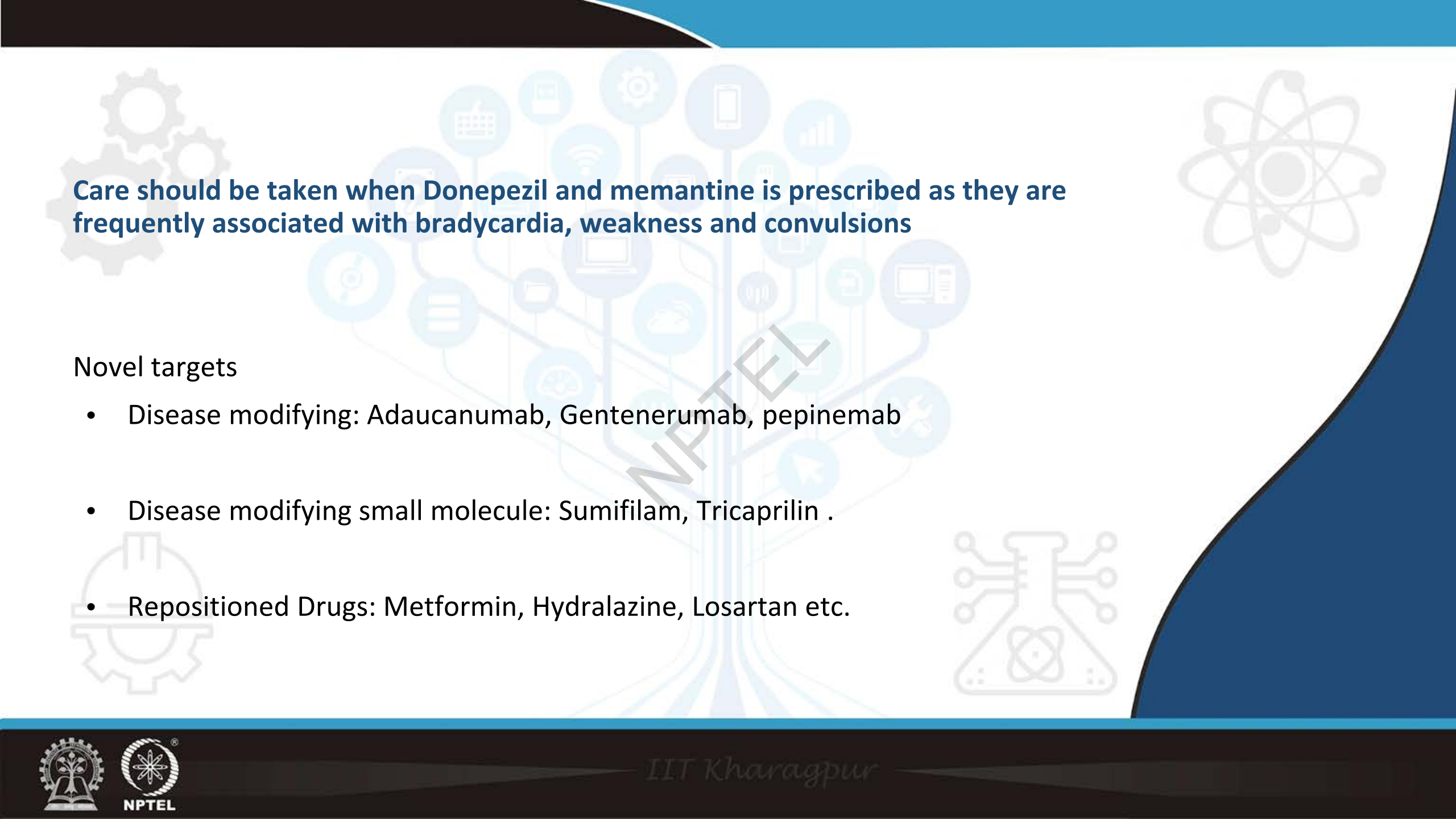
Galantamine (Competitive,Reversible)

- First-line drug for **mild to moderate AD** cases.
- GAL is a selective **tertiary isoquinoline** alkaloid with a **dual mechanism** of action .
- It acts as a **competitive inhibitor of AChE** and can bind allosterically to the α -subunit of nicotinic acetylcholine receptors and activate them.
- Dose-16-24mg XL daily

Memantine (Glutamate Receptor Antagonist)

- Memantine is a low-affinity **Noncompetitive antagonist of the NMDAR**, that prevents over-activation of the glutaminergic system involved in the neurotoxicity in AD cases.
- Memantine is used for the treatment of **moderate to severe AD** alone or in combination with AChEI.
- Blocks the downstream affects of **Tonic** Glutamate release thereby improving memory and neurodegeneration, low affinity results in easy dissociation on **burst** of Glutamate and depolarization occurs.
- **Dose-20 mg daily (10 mg twice)**





Care should be taken when Donepezil and memantine is prescribed as they are frequently associated with bradycardia, weakness and convulsions

Novel targets

- Disease modifying: Adaucanumab, Gentenerumab, pepinemab
- Disease modifying small molecule: Sumifilam, Tricaprilin .
- Repositioned Drugs: Metformin, Hydralazine, Losartan etc.

Non Pharmacological Management

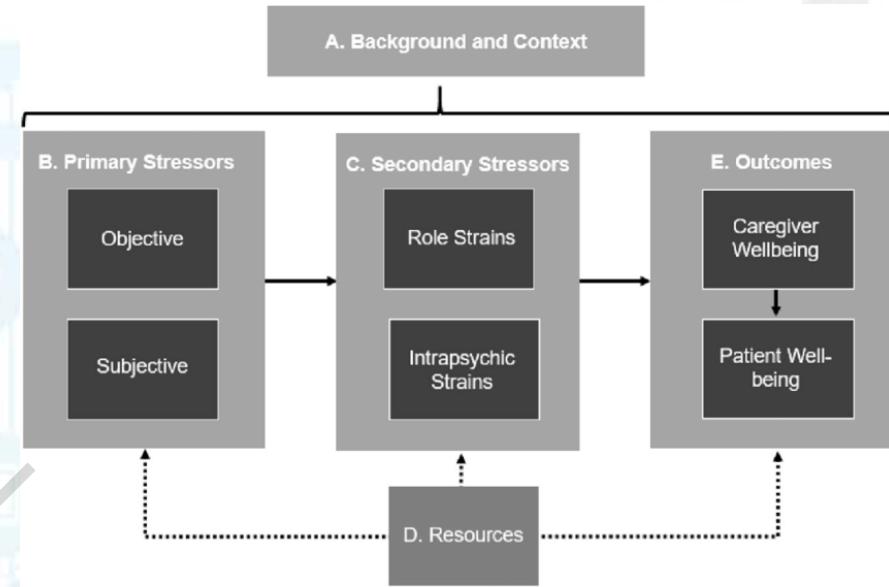


NPTEL



Pearlin and colleagues model of caregiver stress in family members.

- Background context (such as level of support and impact of other life events),
- Primary stressors of the illness (such as the level of help required by the patient and behavioral and psychological problems in dementia [BPSD]),
- Secondary role strains (such as family conflict and social life)
- Intrapsychic strains such as personality, competence, and role captivity of the caregiver



Positive Regard

Warmth

Hostility

Emotional Overinvolvement

Critical Comments

- Psychosocial interventions encompass :

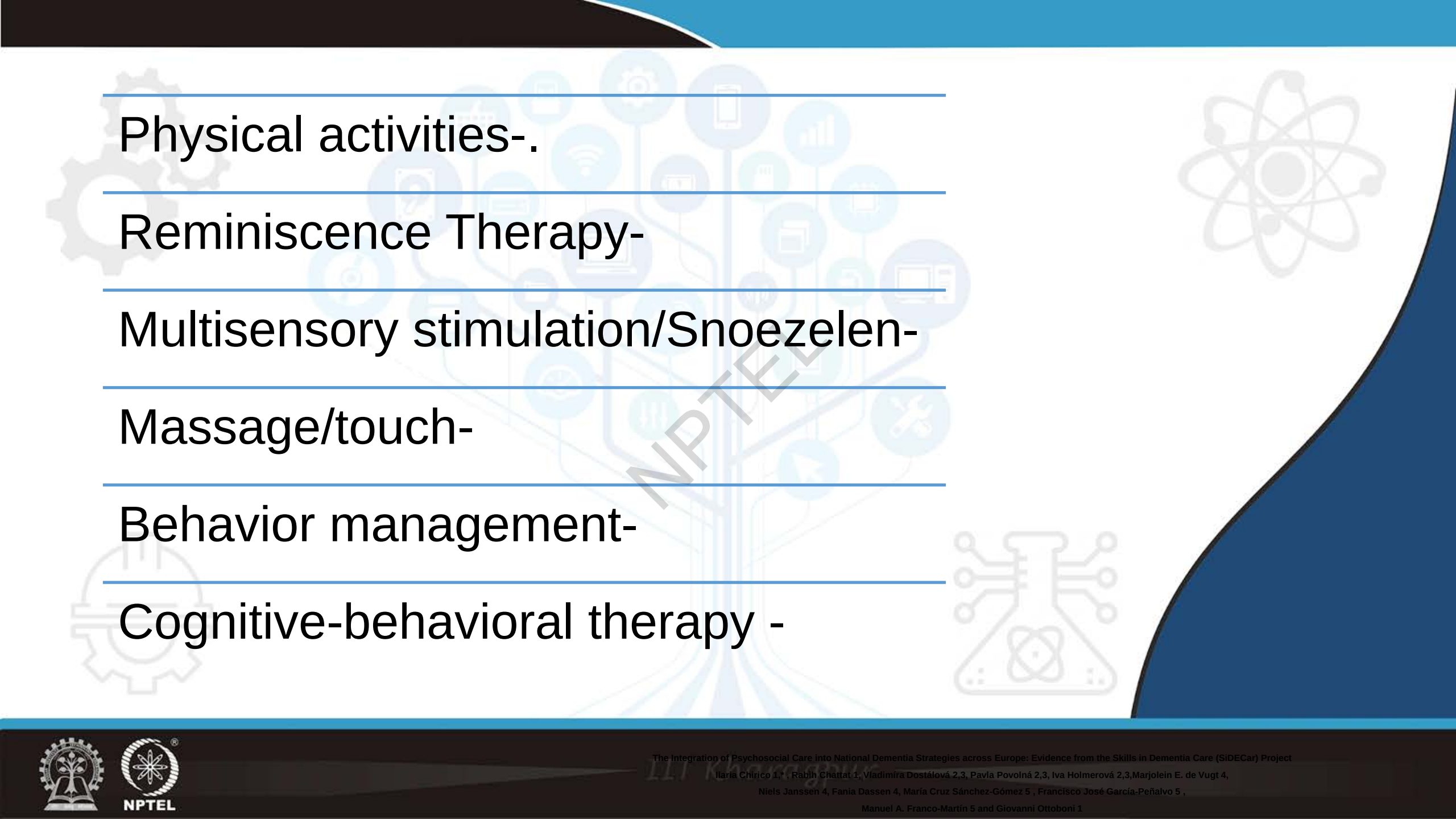
- a) Physical
- b) cognitive
- c) social activities

They have a twofold aim:

- a) They attempt to maintain or improve personal functioning, interpersonal relationships and well-being in people with dementia
- b) They try to minimize the risk of future disability.

Dementia plans and strategies across Europe revealed three main pillars associated with psychosocial care and interventions :

(1) Treatment, (2) Education, and (3) Research.



Physical activities-

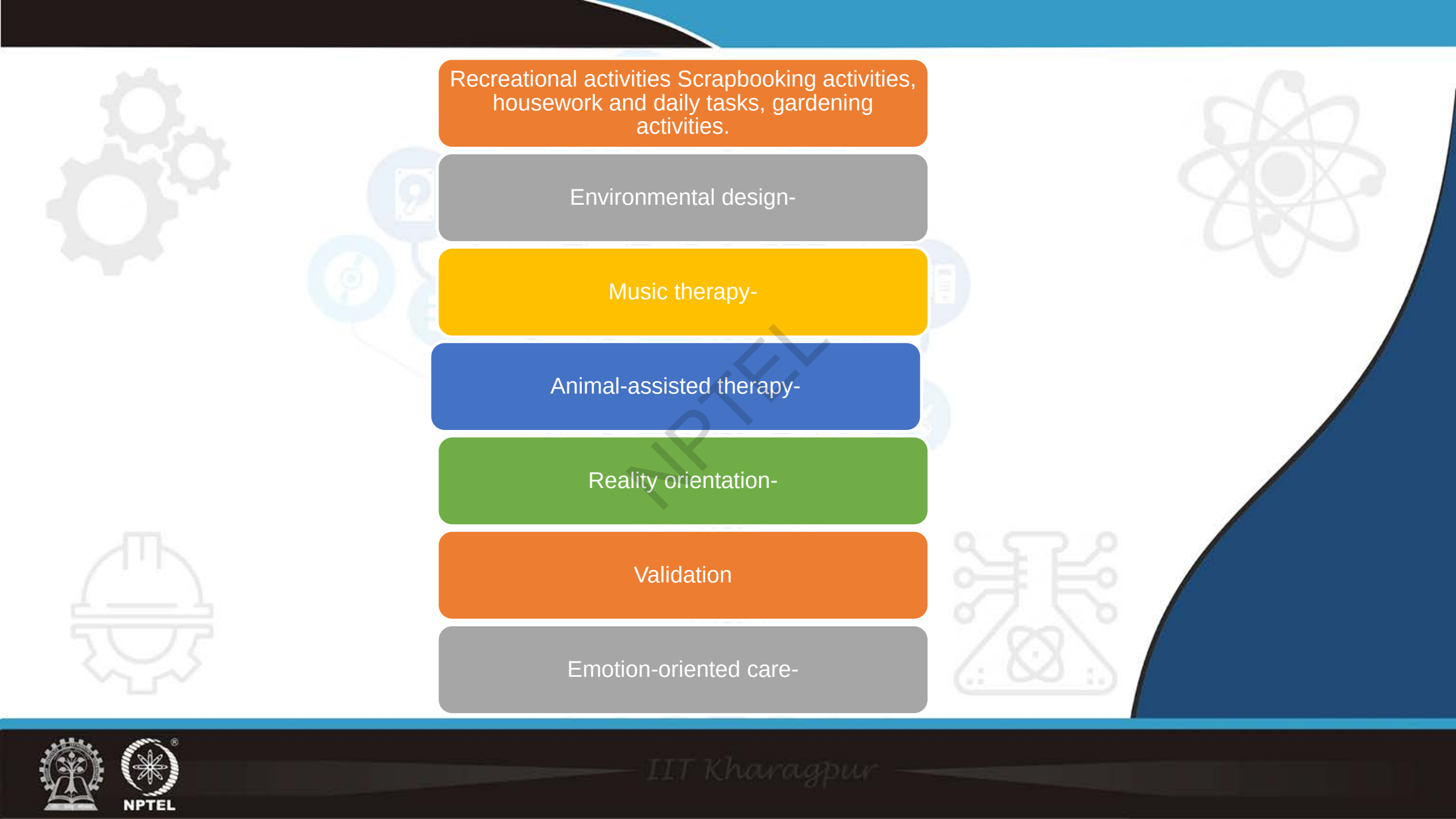
Reminiscence Therapy-

Multisensory stimulation/Snoezelen-

Massage/touch-

Behavior management-

Cognitive-behavioral therapy -



Recreational activities Scrapbooking activities,
housework and daily tasks, gardening
activities.

Environmental design-

Music therapy-

Animal-assisted therapy-

Reality orientation-

Validation

Emotion-oriented care-

Verbal Skills:

Skills, Attitudes and Knowledge

- a) Before Physical Care—Announce single activities

Use one step instructions

Delay physical assistance after verbal prompt

- b) At an early Stage of illness-Avoid arguing

Use of open ended questions suggest words when person is struggling.

- c) At moderate stage- Use persons names and rephrase ,repeat where necessary

- d) General skills- Identify personal communicative styles, positive atmosphere

Reason and Emotion



Recognize unusual communicative attempts-
Recognize behavioural changes eye movements, lifting the corners of the mouth



Reflect your own non-verbal behaviour- Make Eye contact, Avoid high pitch voice, listen carefully



Recognize and answer to emotions-Show empathy



- Change perspective-patients perspective on communication
- Think about activities- Increased use of pleasant activities.
- Reflect on your perceptions-identify impacts on your communication
- General attitude- Calm approach,Avoid over nurturing.



Behavioural management skills: Use distraction techniques, avoid confrontation

Reflect your communication style

Give and receive feedback

Theoretical knowledge:-

Know about MCI, simple forgetting, Dementia, appropriate expectations of the patients and caregiver of Dementia

- ☐ *The Number of people affected by dementia is rapidly increasing and there are no curative treatments as yet for the dementias. Medicines only delay the progression of the disease.*
- ☐ *It is becoming increasingly important to understand and promote the well-being and quality of life to improve the lives of those who are affected by the condition through rapid identification and intervening the illness as early as possible so as to decrease the sufferings.*
- ☐ *Delirium ,Dementia,Depression delineate the clinical entities as they mimic each other.*
- ☐ **It is emphasized to bring down the negative Expressed Emotion in the family by various psychosocial techniques which will create conducive environment for the pateints of Dementia to live harmoniously .**

CONCLUSIONS

-In this lecture we have discussed regarding the concepts of Geriatric depression , Delirium , Dementia with the help of case vignettes.
Detailed pharmacological and Non pharmacological treatment of Dementia

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**THANK
YOU !**