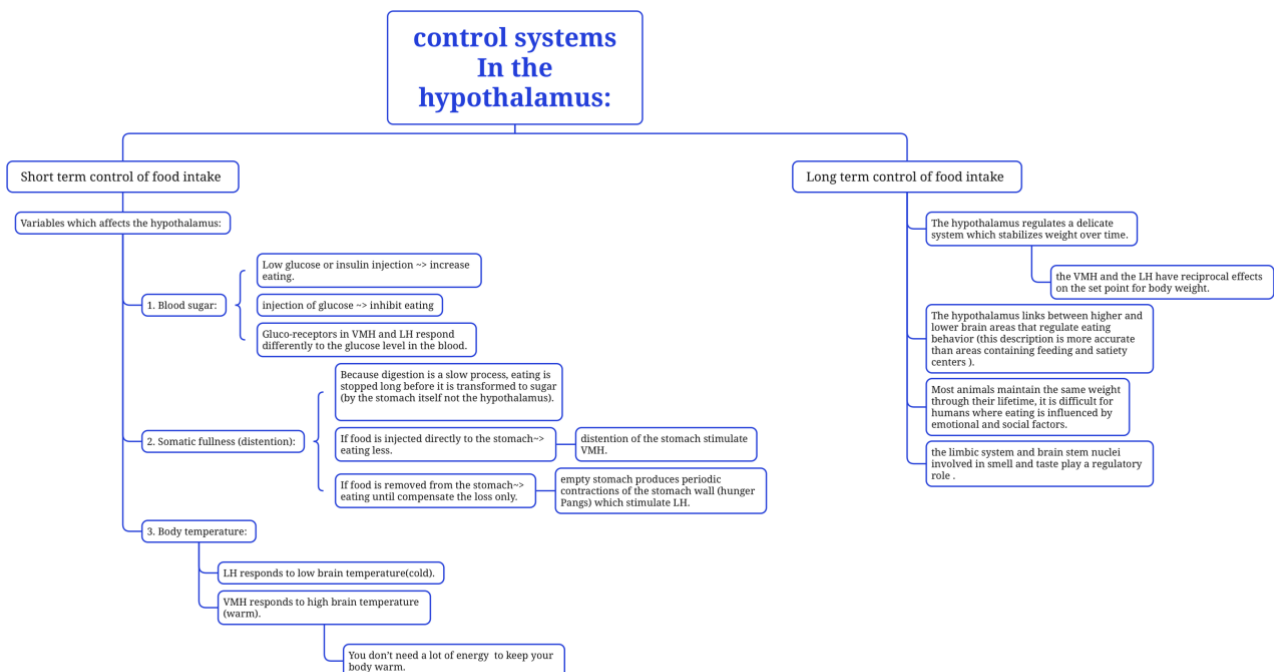


Lecture 5 (Psychophysiology of eating)

- Hunger is a strong motivator.
- In people on semi starvation diets much of their thinking and dreaming is about food.
- When nutrients are depleted from the body, homeostatic mechanism to release stored food is activated. If the body stores are diminished to a point that the automatic homeostatic mechanism can't cope, the whole body is mobilized to seek food.
- Internal signals of hunger: empty or aching pain in the stomach with feeling of weakness.
- External signals of hunger: odor and sight of food, habits, social.
- Regulation of food is crucial to life, so we have several homeostatic controls.
- **hypothalamus:**
 - Located in the base of the brain, connected to the CNS, rich blood supply, affected by chemical state of the blood.
 - Two hypothalamus areas influence food intake (regulatory centers):
 1. The lateral hypothalamus (LH) ~> initiates eating. it stimulates hunger.
 - If damaged, eating is decreased.
 - rats with lesions in the LH refuse all food and water for some time after the operation and will die if not artificially fed, after few weeks they resume eating and drinking on their own but stabilize at a lower weight level (long term control).
 2. The ventromedial hypothalamus (VMH) ~> inhibits eating. Stimulates satiety.
 - If damaged, eating is increased.
 - Rats with damaged VMH become obese to a point, then slow down eating. If diet is restricted, they go to their original weight. If they allowed to eat freely, they go back to their obese weight. If force-fed and become super obese then eat freely, they reduce their intake and return to their obese weight (long term control)
 - Some correlates of body weight must act on the VMH to influence food intake.
 - Autopsies of animals with VMH lesions indicate that the amount of fatty acids in the blood is influential.



- To lose 1kg of body fat, you need to remove 700-7000 kilocalories.
- **Obesity:**
 - Is a major health problem. It stems from unresolved emotional problems.
 - No personality type specific to obese people.
 - Obesity results from the interplay of genetic, metabolic, psychological, and environmental events (varies between individuals).
 - Factors that influence eating: food cues (sight, aroma and taste), they affect how much and when we eat.
 - Obese persons differ in their responses to these cues.
 - obese people are more responsive to such cues (may be inherited).
 - Taste is particularly important to obese people (ice cream test).
 - Obese people are highly responsive to the sight of the food (bright light test).
 - Obese people's eating increased when they are tense or anxious, in contrast with normal weight individuals (film viewing).
 - Overweight individuals are more likely to be dieting than normal-weight ones, which may be a cause of their responsiveness to food.
 - people are classified to (restrained eaters ~> have self control) and (unrestrained eaters ~> don't have self control) **regardless of their weight.**
- ability to keep weight off permanent depends on establishing self-control overeating habits, person must be aware of factors that lead to overeating and try to change them by daily record of eating. Behavior therapy with drugs give the best results.
- weight control is possible, in most cases.
- **Exercises and eating:**
 - The level of body energy expenditure is critical to the weight control.
 - Energy expenditure depends on general activity level and exercise and the basic metabolic rate (the energy needed to maintain minimal body functions).
 - In normal-weight people ~> basal metabolism accounts about two thirds of the energy expenditure. Physical activity accounts about one third.
 - Overweight people ~> energy expenditure is inhibited because the metabolic rate is lower in fat tissue than in lean tissue. Physical activity plays more critical role in the amount of energy expenditure.
 - Metabolic rate is decreased during food deprivation.
 - The inhibition of metabolic rate in overweight and the decreased metabolic rate during food deprivation let weight loss harder.
 - Exercise is critical in weight loss, it burns calories, and helps regulating normal metabolic functioning.
 - NEAT ~> non exercise activity thermogenesis (الحركة اليومية) , it burns about 10 hundred calories per day.

Lecture 6 (Neurochemistry)

- Neurochemistry: the study of chemical inter-neuronal communication.
- Wilhelm and Santiago (late 19th century): the brain consists of individual cells rather than a mass of cytoplasm.

- 20th century: effects of extracts of the adrenal glands on sympathetic nerve tissue was elucidated.
- middle of 20th century: major biogenic amine neurotransmitters were characterized.
- Karl Lashley: envisioned the entire basic apparatus of chemical neurotransmission (neurotransmitter+ specific receptor molecules).
- Criteria for neurotransmitter:
 1. The molecule is synthesized in the neuron.
 2. The molecule is present in the pre-synaptic neuron and released on depolarization.
 3. When administered exogenously, it has the same effect as the endogenous neurotransmitter.
 4. A mechanism in the neuron (in the synaptic cleft) acts to remove or deactivate the neurotransmitter.
- types of neurotransmitters:
 1. The biogenic amines (catecholamines and indolamines) ~> best understood.
 2. amino acids.
 3. Peptides.

1. Biogenic amines:

- Dopamine, noradrenaline and adrenalin (monoamines), are products of the catechol amines synthetic pathway starting from Tyrosine.
- serotonin, acetylcholine, and histamine (indolamines), derived from distinct precursors.
- important in the etiology of psychiatric disorders.

Dopamine	
Tracts	1. Nigrostriatal~> from substantia nigra to the corpus striatum. (parkinsonism, depression) 2. Mesolimbic (mesocortical tract) ~> VTA to cortex. (schizophrenia) 3. Tuberoinfundibular (hypothalamic-pituitary) tract~> cell bodies in the arcuate nucleus and the periventricular area of the hypothalamus, projects to the infundibulum and the anterior pituitary. (prolactin, gynecomastia,galactorea) 4. Medullary tract. (vomitting)
Receptors	<div style="border: 1px solid #004a7c; padding: 10px; width: fit-content; margin: 0 auto;"> <p>2 groups, 5 subtypes</p> <pre> graph TD Root[2 groups, 5 subtypes] --> Group1[D1+D5] Root --> Group2[D2,D3,D4] Group1 --> G1[Activate the stimulatory G protein (G8) -> formation of cAMP.] Group1 --> G2[D5 has higher affinity for dopamin.] Group2 --> G3[D2 (and probably D3,D4) inhibitory G protein (G1) -> inhibition of cAMP formation.] Group2 --> G4[D2 -> mainly in the striatum. D3 -> nucleus acumbens. D4 -> frontal cortex.] </pre> </div> <p>Presented with xmind</p>
theory of schizophrenia	drugs which stimulate Dopamine can induce schizophrenic symptoms, and drugs which block Dopamine can improve schizophrenic symptoms.

- Dopamine may be involved mood disorders (amphetamine is an antidepressant and Levodopa cause mania).
- **Norepinephrine:**
 - noradrenergic cell bodies are mainly in the locus ceruleus in the pons, project to cerebral cortex, limbic system, thalamus and hypothalamus.
 - Metabolized by MAO.
 - Adrenergic receptors:
 1. Alpha receptors: alpha1 (α 1a, α 1b, α 1d), alpha2 (α 2a, α 2b, α 2c) and alpha3~> **inhibit** formation of cAMP.
 2. Beta adrenergic receptors (1,2 and3) ~> **stimulate** formation of cAMP. B1 and 2 regulates the function of nearly every organ in the body (in antagonism to the effects of a receptors), β 3 regulates energy metabolism in adipocytes, **reducing body fat**.
 - The signal transduction of adrenergic receptors is regulated by phosphorylation and changes in protein-protein interaction.
- **Serotonin(5-HT):**
 - Serotonergic cell bodies are mainly in the upper pons and midbrain (raphe nuclei and locus ceruleus), project to basal nuclei, limbic system and cerebral cortex.
 - Its precursor is Tryptophan.
 - Metabolized by MAOa. primary metabolite is 5HIAA.
 - Deficiency causes depression. Overactivity involved in schizophrenia.
 - Serotonergic receptors: seven types (5HT1- 5HT7) with subtype, totally 14 (or 15) receptors.
 - Buspirone (5HT1a agonist) ~> anxiolytic.
 - Clozapine (5HT2 antagonist) ~> antipsychotic.
 - Fluoxetine, called Prozac (SSRI) ~> antidepressant.
- The biogenic amines theory of depression: depression is caused by reduced amount of biogenic amines (norepinephrine, 5HT, dopamine) or reduced sensitivity of their receptors. mania is caused by increasing their amount.
- **Histamine:**
 - Neurons that release histamine are in hypothalamus, project to cerebral cortex, the limbic system and thalamus.
 - 3 types of histamine receptors, H1, H2, H3 (vascular tone control).
 - Anti allergic drugs~> block H1. Cause sedation.
- **Acetylcholine:**
 - synthesized in the cholinergic axon terminal from acetyl coenzyme A and choline **by** choline acetyltransferase.
 - metabolized by acetylcholinesterase. Alzheimers dementia is treated by acetylcholinesterase inhibitors.
 - Tracts:
 1. A group of cholinergic neurons in the nucleus basalis of Meynert, project to the cerebral cortex and limbic system.
 2. Others in the reticular system projects to the cortex, limbic system, hypothalamus and thalamus.

- Some patients with Alzheimers dementia and Down syndrome have degeneration of the neurons in the nucleus basalis of Meynert.
- Cholinergic receptors:
 1. Muscarinic ~> antagonized by atropine and anticholinergic drugs.
 2. Nicotinic.
- Anticholinergic drugs can impair learning and memory in normal people.
- Acetylcholine may also be involved in mood and sleep disorders.

2. Amino acid:

- the building blocks of proteins.
- amino acid neurotransmitters: GABA (inhibitory) and Glutamate (excitatory).
- Some suggest looking to brain as a balance between GABA and Glutamate, while other neurotransmitters are modulating this balance.
- Benzodiazepines, barbiturates and anticonvulsants act through GABA.
- PCP act at Glutamate receptors.

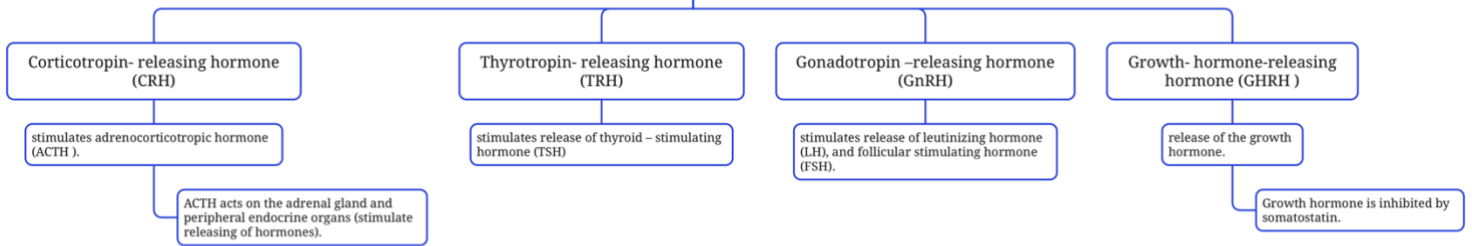
3. Peptides:

- short protein, made of less than 100 amino acids.
- 300 peptide neurotransmitters are found in the human body.
- SubstanceP (pain), Neurotensin (schizophrenia), Cholecystokinin (schizophrenia, eating disorder), Somatostatin (Huntingtons, chorea, Alzheimers).
- Endogenous opioids (enkephalins, endorphins and dynorphines, they are neuropeptides) act on 3 receptors m, k d. they are involved in regulation of stress, pain and mood.

- Neuromodulators:

- Neurotransmitters have an immediate and short-lived effect. Modulators modulate the response of a neuron to a neurotransmitter; this modulatory effect present for longer time.
- Modulatory effect is more involved with fine tuning than with activating or inhibiting the generation of an action potential.
- When a hormone is co-exists and co-secreted with a neurotransmitter, it may be referred to as a neuromodulator (some have been shown to meet criteria for neurotransmitters themselves).
 - Neurohormone is released into the blood stream (not the extraneuronal space), then diffuse into the extraneuronal space and has its effect on neurons.
 - Neurohormones are a neuronal secretory product of neuroendocrine transducer cells of the hypothalamus, they are released from the median eminence of the hypothalamus in response to chemical signals, into the portal hypophyseal blood stream then to the anterior pituitary, to stimulate hormone secretion.
 - these hormones have feedback action (directly or as a modulators) that regulate neurohormone secretion and effects in the brain.

Neurohormones



Presented with **xmind**

Lecture 7 (Human development)

- Developmental milestones: notable events, markers, or turning points in personal development (time sensitive in children in the first 5 years).
- Developmental tasks (such as learning to read and adjusting to sexual maturity) must be mastered for optimal development.
- Psychosocial dilemma: conflict between personal impulses and the social world.
- **Erik Erikson's Stages of psychological Dilemmas (مهم):**
 1. Stage One: **Trust versus mistrust.**
 - Children (first year) are completely dependent on others. Babies either develop Trust (healthy attachment) (adequate warmth, touching, love, and physical care) or Mistrust (cold, indifferent, and rejecting parents).
 2. Stage two: autonomy versus shame and doubt
 - **Autonomy:** Doing things for themselves. (لما يبيلش الطفل يتعلم كيف يعمل أشياء لحاله).
 3. Stage Three: Initiative versus Guilt (لما يبيلش يتعامل مع آلي حواليه ويصير قيادي ويعمل أشياء جديدة)
 - **Guilt:** May occur if parents criticize, prevent play, or discourage a child's questions.
 4. Stage Four: industry versus inferiority
 - **Industry:** when child is praised for **productive activities.**
 - **Inferiority:** if child's efforts are **messy or inadequate.**
 5. Stage Five: identity versus role confusion
 - **Identity:** for adolescents; problems answering, "Who am I?"
 - **Role confusion:** when adolescents are unsure of where they are going.
 6. Stage Six: intimacy versus isolation
 - **Intimacy:** ability to care about others and to share experiences with them.
 - **Isolation:** being alone and uncared for in life
 7. Stage Seven: generativity versus stagnation
 - **Generativity:** interest in guiding the next generation.
 - **Stagnation:** when one is only concerned with one's own needs and comforts.
 8. Stage Eight: integrity versus despair
 - **Integrity:** Self-respect; developed when people have lived richly and responsibly.
 - **Despair:** previous life events are viewed with regret; experiences heartache and remorse.

- Lawrence Kohlberg and Stages of moral Development: (Moral Development: when we acquire values, beliefs, and thinking abilities that guide responsible behavior):
 1. Pre-conventional: moral thinking guided by consequences of actions (punishment, reward).
 2. Conventional: Reasoning based on a desire to please others or to follow **accepted** rules and values.
 3. Post-conventional: follows self-accepted moral principles.
- Stage theorist ~> Freud, Erikson and Ross.
- Developmental Challenges (Gould):
 1. Escape from dominance (16-18 years).
 2. Leaving the family (18-22).
 3. Building a workable Life (22-28).
 4. Crisis of questions (29-34).
 5. Crisis of urgency (35-43).
 6. Attaining stability (43-50).
 7. Mellowing (50 and up).
- Empty Nest Syndrome: A woman may become depressed after her last child leaves home.
- **Childhood Problems:**
 - **Toilet training problems:** (average 30 months, some children take up to six months longer)
 - Enuresis: lack of bladder control (bedwetting) may be physical, more common in males.
 - Encopresis (less common): lack of bowel control (soiling).
 - **Feeding disturbances:**
 - Overeating: eating in excess of daily caloric needs, significant because of convenience and fast foods.
 - Anorexia nervosa: self-starvation or sustained loss of appetite, psychological origins.
 - Pica: eating or chewing inedible objects or substances (lead, chalk, paint chips, clay). Not uncommon among young toddlers.
- **Speech disturbances:**
 - Delayed Speech (after the normal age for language development).
 - Stuttering: chronic hesitation. Involves speech timing mechanisms in brain, NOT parent's fault.
- **Learning disorders:**
 - problems with reading, math or writing.
 - Academic achievement is significantly lower than expected for child's intellectual level and age.
 - Dyslexia: Inability to read with understanding (such as reversing letters), 10-15% of school-age children.
- **Attention-deficit hyperactivity disorder (ADHD):**
 - Behavioral problem (short attention span, rapid speech, impulsivity, and rarely finishing work).
 - More common in males.
 - Treatment:

- **Drugs: Ritalin (methylphenidate):** Stimulant; lengthen attention span and reduce impulsiveness.
 - **Behavior modification:** Application of learning principles to change or eliminate maladaptive or abnormal behavior.
- **Autism:**
 - Severe disorder involving mutism (silence), sensory spinouts (watching a faucet drip for hours), sensory blocking (not responding to an extremely loud noise), tantrums, and unresponsiveness to others.
 - Echolalia: When an autistic child parrots back everything said, like an echo.
- **Child abuse:**
 - Physical or emotional harm caused by violence, mistreatment, or neglect.
 - 3.5 - 14% are physically abused by parents.
 - Abusive parents have high level of stress and frustration.
 - 1/3 of parents who were abused mistreat their own children.
 - Prevention: to change attitudes (parents don't have the right to hit or slap their child).
- **Adolescence:**
 - Puberty: hormonal changes promote rapid physical growth and sexual maturity. Increases body awareness and concerns about physical appearance.
 - Growth spurt: Accelerated growth rate.
 - Social markers: visible or tangible signs that indicate a person's social status or role (driver's license, wedding ring).
 - Peer group: people who share similar social status.
 - Imaginary audiences: adolescents imagine that people are watching them.
- **Middle age issues (crises):**
 - Menopause: menstruation ends, and the woman is no longer able to bear children. Estrogen levels also drop causing mood or appearance changes.
 - **Hot flashes (symptom of menopause in some women):** sudden uncomfortable sensation of heat.
 - Climacteric: When men experience a significant change in health, vigor, or appearance (40-60 years).
- **Gerontology:** study of aging and it's effects.
 - Intellectual abilities:
 - **Fluid abilities:** abilities requiring speed or rapid learning; based on perceptual and motor abilities.
 - **Crystallized Abilities:** Learned (accumulated) knowledge and skills (vocabulary and basic facts).
 - Disengagement theory: it is normal and desirable for people to withdraw from society as they age.
 - Activity theory: people who remain active physically, mentally, and socially will adjust better to aging.
 - Ageism: Discrimination or prejudice based on age.

- **Death and Dying (Elizabeth Kubler-Ross):**
 - Ross is a thanatologist (studies emotional and behavioral), she described five basic reactions to death (in order):
 1. Denial and isolation: denying death's reality and isolating oneself from information confirming that death will occur.
 2. Anger: "why me?". Anger may then be projected onto the living.
 3. Bargaining: "If I can live longer, I'll be a better person."
 4. Depression: futility, exhaustion and deep sadness.
 5. Acceptance: Person is at peace with the concept of death. If death is not sudden, many will accept death calmly.
 - **Attitudes Towards Death:**
 - Hospice: medical facility or program that provides supportive care for terminally ill; to improve person's final days.
 - Living Will: written statement that a person does not wish to have his life artificially prolonged if terminally ill (a Do Not Resuscitate order to doctors).
 - Bereavement: period of adjustment follows death of loved one.
 - Grief: intense sorrow and distress following death of loved one.
 - Shock: emotional numbness experienced after death of loved one.
 - Pangs of grief: intense and anguished yearning for one who has died.
 - Resolution: acceptance of loss and need to build a new life.
- **Happiness:**
 - Subjective well-being: feelings of well-being occur when people are satisfied with their lives, have frequent positive emotions, and have relatively few negative emotions.
 - Happier people tend to be married, comfortable with their work, extraverted, religious and optimistic and satisfied with their lives.

Lecture 8 (Memory)

- Memory is the reconstructing of the Past; means it is not as playing a videotape. It involves inferences (we are unaware about) that fill in gaps in recall.
- **Source Amnesia:** The inability to distinguish what you originally experienced from what you heard or were told later about an event (لما تعرف معلومة بس انت مش عارف من وين عرفتها)
- **Confabulation:** Confusion of an event that happened to someone else with one that happened to you, or a belief that you remember something when it never actually happened. It happens when there are many details, event is easy to imagine, you thought about it many times, or when You focus on emotional reactions to the event rather than what actually happened.

(تعبي الفراغات إلي بذاكرتك بأشياء ما صارت)
- Eyewitness testimony ~>

يعني إذا سألنا شخص عن حدث هو كان شاهد عليه (حادث سيارة مثلاً) الإجابات إلي رح يعطيها بتكون غير دقيقة.

 - Children's testimony: children were asked about if a visitor committed acts that had not occurred, few 4-6 year olds said yes (30% of 3-years old).

When investigators used techniques taken from real child-abuse investigations, most children said yes. (يعني صياغة السؤال أثرت على الإجابة)

- Social pressure, false allegations

- Hypnosis: A procedure in which the practitioner suggests changes in sensations, perceptions, thoughts, feelings, or behavior of the subject, who cooperates by altering his normal cognitive functioning.

- Errors and pseudomemories are so common under hypnosis that the APA opposes use of hypnosis-based testimony in courts of law; few courts allow it.

- Measuring memory (types of memory):

1. Explicit Memory: Conscious, intentional recollection of an event or of an item of information. Types:

- Recall: The ability to retrieve and reproduce from memory previously encountered material.
- Recognition: The ability to identify previously encountered material.

يعني بس تشوفها بتعرف إنك شفتها.

2. Implicit Memory: Unconscious retention in memory, as evidenced by the effect of a previous experience or previously encountered information on current thoughts or actions. methods for measuring:

- Priming: A method for measuring implicit memory in which a person reads or listens to information and is later tested to see whether the information affects performance on another type of task.
- Relearning: A method for measuring retention that compares the time required to relearn material with the time used in the initial learning of the material.

- The three-box model of memory:

1. Sensory Memory (Fleeting Impressions): A memory system that momentarily preserves extremely accurate images of **sensory information**.

- Large capacity, brief retention of images (1/2 second for visual).
- Pattern Recognition: The identification of a stimulus on the basis of information already contained in long-term memory.
- Transferred to short-time memory.

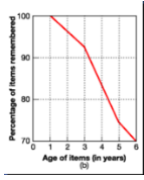
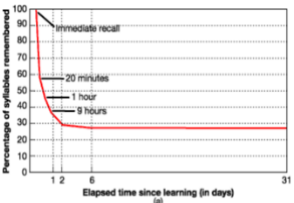
2. Short-term Memory STM (Memory's Scratch Pad): a limited capacity memory system involved in the retention of information for brief periods (30 seconds), it is also used to hold information **retrieved from long-term memory** for temporary use.

- Involved in conscious processing of information.
- Chunk: A meaningful unit of information; it may be composed of smaller units. يعني مثلاً بدك تحفظ ترتيب ١٥ أرقام بخمس ثواني، فتقسم الرقم لأخماس وتحفظ كل ثلاث مع بعض.
- Transferred to long-term memory.

3. Long-term Memory (Final Destination)

- Unlimited capacity.
- Storage thoughts by some to be prominent.
- Information organized and indexed.
- Types:

1. Procedural memories: Memories for performance of actions or skills. (**How**)

2. Declarative memories: Memories of facts, rules, concepts, and events; includes semantic and episodic memory. (**Knowing that**)
 3. Semantic memories: General knowledge, including facts, rules, concepts, and propositions.
 4. Episodic memories: Personally experienced events and the contexts in which they occurred.
- Serial-Position Effect: The tendency for **recall of first and last** items on a list to surpass recall of items in the middle of the list.
 - How we remember: effective encoding, rehearsal, mnemonics.
 - **Rehearsal:**
 - **Maintenance Rehearsal:** Rote repetition of material in order to maintain its availability in memory.
 - **Elaborative Rehearsal:** Association of new information with already stored knowledge and analysis of the new information to make it memorable.
 - **Elaborate encoding** ~> good retention.
 - Forgetting (why we forget): decay, replacement, interference, cue-dependent forgetting, psychogenic amnesia
 - **Decay Theory:** information in memory eventually disappears if it is not accessed; it applies more to short-term than to long-term memory.
 - **Interference:**
 - **Retroactive Interference:** Forgetting that occurs when recently learned material interferes **with the ability to remember similar material stored previously.**
 - **Proactive Interference:** Forgetting that occurs when previously stored material interferes with the ability to remember similar, more recently learned material.
 - **Cue-Dependent Forgetting:** The inability to retrieve information stored in memory because of **insufficient cues for recall.**
 - **Psychogenic Amnesia:** The partial or complete loss of memory (due to nonorganic causes) for threatening information or traumatic experiences.
 - State-Dependent Memory: The tendency to remember something when the rememberer is in **the same physical or mental state as during the original learning** or experience.
 - Herman Ebbinghaus tested his own memory for nonsense syllables. Forgetting was rapid at first and then tapered off (forgetting curve).
 
 - Marigold Linton tested her own memory for **personal events** over a period of several years. Retention fell at a gradual but steady rate.
 
 - Autobiographical Memories:
 - **Childhood Amnesia:** The inability to remember events and experiences that occurred during the first two or three years of life. Cognitive explanations: lack of sense of self, impoverished encoding, a focus on the routine, different ways of thinking about the world.
 - Self-Awareness: Observing your thoughts or feelings. Witnessing yourself from a neutral perspective. It is NOT being self-conscious, analytical, blaming or self-critical.