THE USE OF MNEMONICS FOR BETTER ACADEMIC PERFORMANCE OF MEDICAL UNIVERSITY STUDENTS IN THE STUDY OF ANATOMICAL TERMS

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Annotation. Mnemonics are a combination of special methods and techniques that make it easier to memorize the necessary information and increase the amount of memory by forming associations. The aim of the work is to develop techniques that will help medical students effectively learn anatomical terms by facilitating the memorization of large amounts of information. In this article, we used the following mnemonic techniques: first letter mnemonics or acronyms and the “Comparison” method - to identify common features in the studied and well-known material, namely the similarity in form. This article includes mnemonics that will help to easily learn the following terms namely the anatomy of the skeleton bones for memorizing the bones of the medial wall of the orbit, the bones in the nasal septum, the wrist bones, the ankle tarsal bones, recognition of thoracic vertebrae from the lumbar, cranial bones, upper limb bones, bones of the lower limb, the vertebral regions, the hand, the arm bones and the bone projections. Also included are mnemonics on the anatomy of the cranial nerves that pass through the superior orbital fissure and branches of the facial nerve, mnemonics on the anatomy of the peripheral nervous system, namely somatic nerve plexuses, which include the brachial plexus branches. Also included are mnemonics on the anatomy of the upper limbs muscles, namely the muscles that form the rotator cuff in the shoulder, muscles involved in elbow flexion and the anterior flexor muscles of the forearm and mnemonics on the anatomy of the trunk muscles, namely the paired erector spinae muscles and abdominal muscles. Finally, this article includes a mnemonic on the anatomy of the male reproductive system, namely the layers of the scrotum. In the future, new mnemonics will be developed that relate to splanchnology, anatomy of the central nervous system, anatomy of the sensory organs and anatomy of the cardiovascular system, which were not listed above.

Keywords: mnemonics, mnemonic technique, anatomical terms, English-speaking students.

Introduction

Mnemonics (Greek Τα μνημονικά - the art of memorization), mnemonic techniques are a combination of special methods and techniques that make it easier to memorize the necessary information and increase the amount of memory by forming associations. Words with an unknown, abstract meaning are difficult for most people to remember. If such a word is "memorized", then it disappears from memory after a few days. For lasting and at the same time easy memorization, the word should be filled with meaning (mnemonic methods) - something that is associated with specific vivid visual, sound images, with strong sensations.

Mnemotics is one of the oldest applied disciplines. The first known texts on mnemonics were created by the ancient Greeks. The experience gained over time in the application of mnemonics began to be used in teaching various disciplines. Teaching mnemonics in medical school has become a widespread practice, with its inclusion in textbooks and articles [3, 4, 5, 6, 9, 11].

The aim of the work was to develop techniques that will help students of medical institutions to effectively learn anatomical terms by facilitating the memorization of large amounts of information.

Materials and methods

Mnemonic systems are special technologies or strategies that are deliberately used to improve memory [8]. Mnemonic methods in anatomy are a special technique that is designed to improve the memorization of terminology [2]. The formation of associations has a good effect on the brain work, improving a person's ability to systematize knowledge, helps to memorize large amounts of information faster and more efficiently [10].

In this article, we used the following mnemonic techniques:

- Mnemonics by first letters or acronyms. This method is based on taking the first letter of the name of each word that needs to be memorized in general or in a certain sequence, and composing a new word or phrase. For best results when played back in memory, the phrase should make sense; it should also not be too long and witty [2].

- Comparison method - identifying common features in the studied and well-known material. Similarity in shape, for example, establishing the similarity of the cuboid and sphenoid bones of the feet with parts of the accordion to memorize their location [9].

Three basic principles of mnemonics (the use of associations, encoded information and the formation of an emotional attitude) are often used in pedagogical mnemonics and can be successfully integrated into the process of studying anatomy [7].

Results. Discussion

In order to memorize the bones of the medial wall of the orbit, students are encouraged to study the mnemonic...
In order to memorize the bones in the nasal septum, students are encouraged to study the mnemonic phrase: **My Very Fine Nasal SEPtum**, where the first letters of each word of this sentence correspond to the first letters of the bones in the nasal septum, that is, **M** in the word **My** corresponds to the first letter in **Maxilla** (frontal process), **V** in the word **Very** corresponds to the first letter in **Vomer**, **F** in the word **Fine** corresponds to the first letter in **Frontal**, **N** in the word **Nasal** corresponds to the first letter in **Nasal**, **S** in the word **SEPtum** corresponds to the first letter in **Sphenoid**, **E** in the word **SEPtum** corresponds to the first letter in **Ethmoid**, **P** in the word **SEPtum** corresponds to the first letter in **Pallatine** (oxford medical) [1].

In order to memorize the wrist bones, students are encouraged to study the mnemonic phrase: **She Likes To Play, Try To Catch Her**, where the first letters of each word of this sentence correspond to the first letters of the wrist bones, that is, **S** in the word **She** corresponds to the first letter in **Scaphoid**, **L** in the word **Likes** corresponds to the first letter in **Lunate**, **T** in the word **To** corresponds to the first letter in **Triquetrum**, **P** in the word **Play** corresponds to the first letter in **Pisiform**, **T** in the word **Try** corresponds to the first letter in **Trapezium**, **H** in the word **Her** corresponds to the first letter in **Hamate** (oxford medical) [1].

In order to memorize the vertebrae, students can learn an alternative mnemonic phrase: **Stop Letting Those People Touch The Cadaver's Hand**, where the first letters of each word of this sentence correspond to the first letters of the vertebrae, that is, **S** in the word **Stop** corresponds to the first letter in **Scaphoid**, **L** in the word **Letting** corresponds to the first letter in **Lunate**, **T** in the word **Those** corresponds to the first letter in **Triquetrum**, **P** in the word **People** corresponds to the first letter in **Pisiform**, **T** in the word **Touch** corresponds to the first letter in **Trapezium**, **H** in the word **Hand** corresponds to the first letter in **Hamate** (oxford medical) [1].

In order to memorize the ankle tarsal bones, students are encouraged to learn the mnemonic phrase: **Tiger Cubs Need MILC**, where the first letters of each word in this sentence correspond to the first letters of the ankle tarsal bones, namely **T** in the word **Tiger** corresponds to the first letter in **Talus**, **C** in the word **Cubs** corresponds to the first letter in **Calcaneus**, **N** in the word **Need** corresponds to the first letter in **Navicular**, **M** in the word **MILC** corresponds to the first letter in **Medial cuneiform**, **I** in the word **MILC** corresponds to the first letter in **Intermediate cuneiform**, **L** in the word **MILC** corresponds to the first letter in **Lateral cuneiform**, **C** in the word **MILC** corresponds to the first letter in **Cuboid**.

Vertebrae: To recognize the thoracic vertebrae from the lumbar vertebrae, remember that the thoracic vertebrae are heart-shaped because the heart is located in the chest. The lumbar vertebrae are kidney-shaped because the kidneys are located in the lumbar region (Fig. 1).

In order to memorize the cranial bones, students are encouraged to learn the mnemonic phrase: **PEST OF 6**, where the first letters of each word of this sentence correspond to the first letters of the cranial bones, namely **P** in the word **PEST** corresponds to the first letter in **Parietal**, **E** in the word **PEST** corresponds to the first letter in **Ethmoid**, **S** in the word **PEST** corresponds to the first letter in **Sphenoid**, **O** in the word **PEST** corresponds to the first letter in **Occipital**, **F** in the word **OF** corresponds to the first letter in **Frontal**, 6 just reminds you to remember 6 bones.

In order to memorize the cranial bones, students can learn an alternative mnemonic phrase: **Fat People Only Eat Thick Steak**, where the first letters of each word of this sentence correspond to the first letters of the cranial bones, namely **F** in the word **Fat** corresponds to the first letter in **Frontal**, **P** in the word **People** corresponds to the first letter in **Parietal**, **O** in the word **Only** corresponds to the first letter in **Occipital**, **E** in the word **Eat** corresponds to the first letter in **Ethmoid**, **T** in the word **Thick** corresponds to the first letter in **Temporal**, **S** in the word **Steak** corresponds to the first letter in **Sphenoid**.

In order to memorize the bones of the upper limb and the order of their location from proximal to distal, students are encouraged to learn the mnemonic phrase: **How Rare U Cook Mesquite Pork**, where the first letters of each word in this sentence correspond to the first letters of the upper limb bones, namely **H** in the word **How** corresponds to the first letter in **Humeral**, **R** in the word **Rare** corresponds to the first letter in **Radius**, **U** in the word **U** corresponds to the first letter in **Ulna**, **C** in the word **Cook** corresponds to the first letter in **Cubital** (oxford medical) [1].
In order to memorize the bones of the lower limb and the order of their location from proximal to distal students are encouraged to learn the mnemonic phrase: *From Pennies To Fives They May Pay*, where the first letters of each word in this sentence correspond to the first letters of the lower extremity bones, namely F in the word *From* corresponds to the first letter in *Femur*, P in the word *Pennies* corresponds to the first letter in *Patella*, T in the word *To* corresponds to the first letter in *Tibia*, F in the word *Fives* corresponds to the first letter in *Fibula*, T in the word *They* corresponds to the first letter in *Tarsal bones*, M in the word *May* corresponds to the first letter in *Metatarsal bones*, P in the word *Pay* corresponds to the first letter in *Phalanges*.

In order to memorize the vertebral regions and the order of their location from the superior part of the spine to the inferior part, students are encouraged to learn the mnemonic phrase: *Can The Ladies Stand Comfortably*, where the first letters of each word in this sentence correspond to the first letters of vertebral sections, namely C in the word *Can* corresponds to the first letter in *Cervical*, L in the word *Ladies* corresponds to the first letter in *Lumbar*, S in the word *Stand* corresponds to the first letter in *Sacral*, C in the word *Comfortably* corresponds to the first letter in *Coccygeal*.

In order to remember the bones of the hand and the order of their location from the distal end of the fingertips to the wrist, students are encouraged to learn the mnemonic phrase: *Please Make Cookies*, where the first letters of each word in this sentence correspond to the first letters of the hand bones, namely P in the word *Please* corresponds to the first letter in *Phalanges*, M in the word *Make* corresponds to the first letter in *Metacarpal bones*, C in the word *Cookies* corresponds to the first letter in *Carpal bones*.

In order to memorize the bones of the arm, students are encouraged to learn the mnemonic phrase: *Ultra Red Hair*, where the first letters of each word in this sentence correspond to the first letters of the bones of the hand, namely U in the word *Ultra* corresponds to the first letter in *Ulna*, R in the word *Red* corresponds to the first letter in *Radius*, H in the word *Hair* corresponds to the first letter in *Humerus*.

In order to remember the projections of the bone, students are encouraged to learn the mnemonic phrase: *People Take Teaspoons Temporarily Causing Constipation*, where the first letters of each word in this sentence correspond to the first letters of the bone projections, namely P in the word *People* corresponds to the first letter in *Process*, T in the word *Take* corresponds to the first letter in *Tubercle*, T in the word *Teaspoons* corresponds to the first letter in *Tuberosity*, T in the word *Temporarily* corresponds to the first letter in *Trochanter*, C in the word *Causing* corresponds to the first letter in *Condyle*, C in the word *Constipation* corresponds to the first letter in *Crest*.

In order to remember the nerves passing through the superior orbital fissure, students are encouraged to study the mnemonic phrase: *Live Frankly To See Absolutely No Insult*, where the first letters of each word in this sentence correspond to the first letters of the nerves, namely L in the word *Live* corresponds to the first letter in *Lacrimal nerve*, F in the word *Frankly* corresponds to the first letter in *Frontal nerve*, T in the word *To* corresponds to the first letter in *Trochelear nerve*, S in the word *See* corresponds to the first letter in *Superior division of oculomotor nerve*, A in the word *Absolutely* corresponds to the first letter in *Abducens nerve*, N in the word *No* corresponds to the first letter in the *Nasociliary nerve*, I in the word *Insult* corresponds to the first letter in the *Inferior division of the oculomotor nerve* (oxford medical) [1].

In order to memorize the branches of the facial nerve, students are encouraged to study the mnemonic phrase: *Ten Zulus Bought My Cat*, where the first letters of each word in this sentence correspond to the first letters of the branches, namely T in the word *Ten* corresponds to the first letter in *Temporal*, Z in the word *Zulus* corresponds to the first letter in *Zygomatic*, B in the word *Bought* corresponds to the first letter in *Buccal*, M in the word *My* corresponds to the first letter in *Mandibular*, C in the word *Cat* corresponds to the first letter in *Cervical* (oxford medical) [1].

In order to memorize the brachial plexus branches, students are encouraged to study the mnemonic phrase: *My Aunt Raped My Uncle*, where the first letters of each word in this sentence correspond to the first letters of the branches, namely M in the word *My* corresponds to the first letter in *Musculocutaneous*, A in the word *Aunt* corresponds to the first letter in *Axillary*, R in the word *Raped* corresponds to the first letter in *Radial*, M in the word *My* corresponds to the first letter in *Median*, U in the word *Uncle* corresponds to the first letter in *Ulnar*.

In order to remember which muscles form the rotator cuff in the shoulder, students are encouraged to learn the mnemonic word: *SITS*, where the first letters of this word correspond to the first letters of the muscles forming the rotator cuff, namely S in the word *SITS* corresponds to the first letter in *Supraspinatus*, I in the word *SITS* corresponds to the first letter in *Infraspinatus*, T in the word *SITS* corresponds to the first letter in *Teres minor*, S in the word *SITS* corresponds to the first letter in *Subscapularis*.

In order to remember which muscles are involved in elbow flexion, students are encouraged to learn the mnemonic phrase: *3 B’s Bend the elbow*, where the first letters of this word correspond to the first letters of the muscles involved in elbow flexion, namely the first B is *Biceps*, the second B is *Brachialis*, the third B is *Brachioradialis* (oxford medical) [1].
In order to memorize the anterior flexor muscles of the forearm, students are encouraged to learn the mnemonic phrase: **Cats Run Circles Under Dogs Stomachs**, where the first letters of each word in this sentence correspond to the first letters of the muscle, namely C in the word **Cats** corresponds to the first letter in **Carpi**, R in the word **Run** corresponds to the first letter in **Radialis**, C in the word **Circles** corresponds to the first letter in **Carpi**, U in the word **Under** corresponds to the first letter in **Ulnaris**, D in the word **Dogs** corresponds to the first letter in **Digitorum**, S in the word **Stomachs** corresponds to the first letter in **Spinalis**.

In order to remember the paired erector spinae muscles and their location from lateral to medial students are recommended to study the mnemonic phrase: **I Like Standing**, where the first letters of each word of this sentence correspond to the first letters of muscles, namely I in word **I** corresponds to the first letter in **Iliocostalis**, L in the word **Like** corresponds to the first letter in **Longissimus**, S in the word **Standing** corresponds to the first letter in **Spinalis**.

In order to memorize the abdominal muscles, students are encouraged to study the mnemonic phrase: **Spare TIRE around their abdomen**, where the first letters of the word **TIRE** correspond to the first letters of the muscles, and the word “abdomen” indicates where these muscles are located. So T in the word **TIRE** corresponds to the first letter in **Transversus abdominis**, I in the word **TIRE** corresponds to the first letter in **Internal abdominal oblique**, R in the word **TIRE** corresponds to the first letter in **Rectus abdomini**, E in the word **TIRE** corresponds to the first letter in **External abdominal oblique**.

In order to memorize the layers of the scrotum, students are encouraged to study the mnemonic phrase: **Some Damn Englishmen Called It The Testis**, where the first letters of each word of this sentence correspond to the first letters of the scrotum layers, namely S in the word **Some** corresponds to the first letter in **Skin**, D in the word **Damn** corresponds to the first letter in **Dartos**, E in **Englishmen** corresponds to the first letter in **External** spermatfascia, C in **Called** corresponds to the first letter in **Cremaster** muscle, **I** in **It** corresponds to the first letter in **Internal** spermatic fascia, **T** in **The** corresponds to the first letter in **Tunica vaginalis**, **S** in the word **Testis** corresponds to the word **Testis** (oxford medical) [1].

**Conclusions and prospects for further development**

1. This article includes mnemonics that will help to easily learn the following terms, namely the anatomy of the skeleton bones for memorizing the bones of the medial wall of the orbit, the bones in the nasal septum, the wrist bones, the ankle tarsal bones, recognition of thoracic vertebrae from the lumbar, cranial bones, upper limb bones and the order of their location from proximal to distal, bones of the lower limb and the order of their location from proximal to distal, the vertebral regions and the order of their location from the superior part of the spine to the inferior part, the hand bones and the order of their location from the distal end of the fingertips to the wrist, the arm bones and the bone projections.

2. Also included are mnemonics on the anatomy of the cranial nerves that pass through the superior orbital fissure and branches of the facial nerve, mnemonics on the anatomy of the peripheral nervous system, namely somatic nerve plexuses, which include the brachial plexus branches.

3. Also included are mnemonics on the anatomy of the upper limbs muscles, namely the muscles that form the rotator cuff in the shoulder, muscles involved in elbow flexion and the anterior flexor muscles of the forearm and mnemonics on the anatomy of the trunk muscles, namely the paired erector spinea muscles and their location from lateral to medial and abdominal muscles.

4. Finally, this article includes a mnemonic on the anatomy of the male reproductive system, namely the layers of the scrotum.

In the future, new mnemonics will be developed that relate to splanchology, anatomy of the central nervous system, anatomy of the sensory organs and anatomy of the cardiovascular system, which were not listed above.

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