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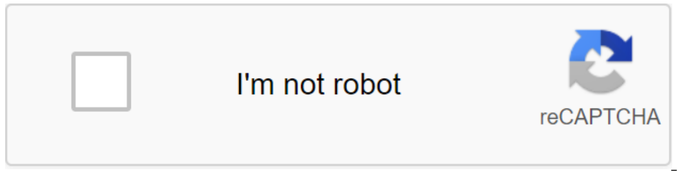

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The function of cranial vapors is systematically investigated; must always be carried out in an orderly, two-way and comparative manner. There are 12 cranial nerves, however, of each of them will be considered only those elements that are most important to know to perform the appropriate diagnostic approach in accordance with the clinical context of the patient. Evaluation of all except the lobby-cochlear nerve (VIII pair) which would otherwise have to be evaluated in depth for the fact that the purpose of the possible change presented by the patient with dizzying symptoms will be mentioned. Olfactory nerve (I pair): It is not regularly investigated, as in most cases olfactory disorders are caused by nasousinal pathologies or problems and not central origin, besides in the context of a dizzying patient it is not so relevant. This will be done with olfactory stimulation from various substances. Optical nerve (II pair): Your scan is based on an estimate of 4 aspects. Remote visual acuity is usually done using the Snellen table, or if the instrument is not available, a less accurate assessment can be made using the fingerprint counting method, showing the patient's hand at different distances, asking him to calculate the number of fingers it differs. As for close visual acuity, the Jaeger table is used, which displays a series of text in a reduced size or a letter from Rosenbaum that displays letters and numbers that should be placed at 30 cm and determines which line of the smallest types you can read correctly. If there is no lack of these tools, it may also be helpful to ask the patient to read any other text. Chromatic vision: the easiest way to evaluate it is to show the patient objects of primary colors (blue, yellow and red) by assessing each eye separately (including the contralateral eye); first you are asked if you are different in color and then you are asked to name it. Visual fields: The easiest clinical test to evaluate them is confrontational campimetry, in which the doctor compares his field of vision (assuming that his peripheral vision is normal) with those of the patient. Facing each other (sitting for comfort and at a distance of about 1 meter), both cover one eye counterlaterally (doctor, right eye and patient, left eye) and must be constantly looking at each other's discovered eyes. Your doctor moves your index finger (or any other object) along the main axials of the field of vision (top, bottom, temporal and nasal) at the same distance from both, and the patient must indicate when you see or stop seeing your finger or object; This method allows you to detect such as hemianopsia and some quadrantanopsia. Eye background: the room should be darkened as much as possible in order to promote pupil expansion and facilitate exploration; You are then instructed to look at the fixed point as far as possible (this also contributes to the extension of the pupil). The ray of light from the ophthalmoscope affects the eye, which will be examined at a distance of 30-35 cm in the direction of the nose and as soon as the red reflection is identified, it slowly approaches until the image is received. The retina will be observed and the vessels are followed to the nasal retina until the optical disk is found, and then the vessels follow to the periphery in each of the four directions; Finally, the patient is asked to look directly into the light to briefly examine the macula. Oculomotor nerves (III, IV and VI pairs): These nerves are evaluated together because they are all inert in the muscles of the eye movements. The doctor must constantly look at the patient's eye movements to determine if they are conjuged and symmetrical. Amplitude and symmetry of the palebrade slit (given the muscle lifting of the eyelids, iii cranial nerve) should be checked, such as a complete paresia of the III nerve causing drooping or palebral ptosis. It should also be assessed that the conjuged view is normal, i.e. that both eyeballs are symmetrical, in a central position when they are at rest and do not have any abnormalities. To study eye movements, the patient is asked to continue vision and without moving his head, the finger is an expert who must move in the direction of the look: lateral (external rectal muscle, VI nerve), medial (inner rectal muscle, III nerve), up and side (upper rectal muscle, III nerve), downward and lateral (lower rectal muscle, III nerve) , IV nerve). It is also necessary to study the morphology and diameter of the pupils (III nerve): the shape (round), contour (ordinary), the situation (central), the size (2-5 mm, myosis vs. midriasis) and symmetry (isocory against anisoria), as well as the reflexes of the pupil (preferably the darkening of the room): these are mixed reflexes involving both the II nerve (afferent component) and the nerve component. Direct reflection of the photomotor: Perpendicular to the eye, the glowing beam is directed from the patient's ear and moves the medialli until the pupil strikes; pupil reduction (myosis) should be observed in the stimulated eye; Consensus or indirect reflections of the photomotor: the stimulus and response are the same, only this time it should be delivered counteralateral eye, in which the contraction of the contralateral pupil should be observed. The implementation of both reflexes will allow, in the case of one-sided pupil midriasis, to differentiate if it is a change of optic nerve (II) against the oculomotor nerve (III). Trigeminal Nerve (V pair): It is responsible for transmitting facial sensitivity and providing motor inertia of chewing muscles (pterigoids, temporals and maseteros). Motor function: When examined, the pathism of the mazetero and temporal muscles is evaluated, the patient is asked to tighten the teeth tightly while both masked muscles are felt, and then the same is done, feeling both temporal muscles to assess tone and strength. It can also be studied by asking the patient to perform anti-resistance movements (put by the doctor's hand), such as opening the mouth or moving the jaw lateral (pterigoid muscle). Sensory function: the tactile sensitivity of the face of the three branches of the nerve is investigated: ophthalmic, maxillofacial and mundibular. Full scanning requires an assessment of sensitivity to the thick touch surface, with a thin, blunt object, pain with a pointed object, and temperature. The patient is asked to close his eyes and with the chosen object gently touched in the territory of the inert of each of the branches on a bilateral basis, comparatively and from top to bottom. Initially, the patient should specify only whether he or she feels not (the area of probable anesthesia), and then wonder whether there is a difference between the sensation on one side and the other (the area of hypoesthesia). The root reflex (palebral closure occurs by gently rubbing the edges of the cornea with a clean, blunt object) is recommended only for patients who do not cooperate properly or in patients with impaired vigilance. Facial nerve (VII pair): It is also a mixed nerve, the function of which is the motor inertia of most facial muscles and the taste sensation of the previous two-thirds of the tongue (research on the routine function of taste is not offered). Motor function: the patient is encouraged to perform various facial movements or gestures, starting with the forehead and ending with the mouth (wrinkles of the forehead, raise eyebrows, frown, imitate giving the beak or try to whistle, among other things), in order to determine facial asymmetry, which suggested parsion or paralysis of the facial musculature. Glosophal nerve (IX pair) and vagus nerve (X pair): They are studied together (inert functionally related structures). It should be noted whether the height of the sky veil is symmetrical and whether the valve is in the central position, in addition to assessing whether there are problems in the background that can During an oroscopy, asking the patient to say on the phone A for a long time; in the case of one-sided paresia of the nerves IX and X, it is observed that one of the pillars of the sky does not rise, which leads to the deviation of the tongue to a healthy side. Secondly, the patient is asked to open his mouth and touch the back wall of pharyng with a lingual depressant and the reduction of pillars at the same time and the sickening reflex should be observed. Accessory Nerve (XI pair): It is responsible for the motor inertation of trapeze and walloidoid muscles, so his study consists of an assessment of trophi (by examination), tone and strength (asking the patient to lift shoulders and turn his head against resistance) of both muscles. Hypoglysis nerve (xii vapor): Gives motor inertation of the tongue, so the patient is investigated asking to speak and mobilize it in all directions; will be redirected to a healthy side. Author: Alejandro Restrepo Medical Strap Otolaryngologist Introduction to this Back to Bases, we will review the neurological examination of the child, reuse for the next issue of the evaluation of neurodevelopment. Neurological examination, even if subjected, is an important element of any pediatric examination, as it provides information on the functioning of other organs and systems. At the same time, neurological examination requires proper general examination, as in many cases the main aspects of neurological diagnosis are hidden in other organs. Particularly important: anthropometric assessment (including the correct measurement of the perimeter of cephaly or occhipitofronal circumference, which is measured by flexible, insoluble tape around the perimeter, which passes through the occipusio and supracilar arches and the measurement of which must be repeated at least 2 times before being considered pathological), observation of skin damage (table I), dysmorphological assessment (II) Neurological examination depends on its systematization. It is important to always follow the same pattern and maintain it with adaptation so that we can be quick, accurate and draw conclusions about the assessment. In this article, we propose a systemization that includes, in our opinion, the most important maneuvers for neurological examination in the field of general pediatrics. Assessment of cognition The first step of neurological evaluation involves assessing the level of consciousness and the degree of orientation of the patient (if possible, in time, space and man). It is therefore important to determine the degree of attention and concentration which is usually determined with a certain degree of cooperation. These cognitive functions should always be recorded because they affect the implementation of any neurological test and its changing conditions of the rest of the scan. It's also easy to include an overall retrograde memory and communicative rating when doing the rest of the scan. Retrograde memory is evaluated by asking the patient about their age, birthday and the name of their family, friends or teachers. To assess communication, we need to look at the patient's verbal expression (whether the language is spontaneous and fluid - fluency, whether he is able to repeat sounds or phrases - repetition - or if he is able to name objects - nomination), in verbal compression (understands the sequence of orders; for example, optimize the time and investigate at the same time motor skills and motor practices, the patient may be asked to undress himself incompletely or in a certain manner). Finally, it is important to try to assess the patient's level of intelligence and reflect it subtly but clearly in the survey journal. If time is available or while a medical history is done as part of a patient's cognitive exam and manual skills, it is advisable to ask him or her to draw. If you are a child under the age of 5, usually in normal clinical practice, a free drawing is used. For children over 5 years old, several tests can be used, but perhaps the most interesting, because it is very easy to apply and quickly dial, is the Pascual graph engine test (4.5). If the patient is needed or evaluated for cognitive problems, the evaluation of cognitive function should be expanded, and, already in a specialized consultation, we regularly investigate: The skill of reading: you can collect the impression by evaluating reading aloud and understanding the simple text. It should always be evaluated in school failures and can lead to more complex neuropsychological evaluations. Skill calculation: your score depends on age; Thus, at 2-3 years of life, the child should understand the difference between 1 and 2; at the age of 3-4 years there is a concept of quantity (distinguishes groups where there is more or less one number); In 5-6 years, you should know how to count to 20-30; in 6-7 years, he must add by heart; and in 7-8 years, learn the multiplication tables well. Changes in anusmogradive memory: the ability to memorize three words in 3-5 minutes. Changes in the frontal lobe: very important in adolescents and whose examination takes some time and is relatively difficult, especially in their because it depends on the intellectual level and motivation of the patient. An easy way is to ask the patient about why he likes something or explains what any utterance means. The existence of dyspraxia: their assessment is also relatively complex, depends on the cognitive level of the patient and avoids basic examination. If in doubt, constructive apraxia can be evaluated by drawing the watch freely or by imitating the motor sequence of toothwashing. Assessment of the motor system Motor rating system includes assessment of muscle strength, tone and appearance (troxism), assessment of osteotendinous and skin reflexes, assessment of gait, posture and manipulation, presence of abnormal movements, as well as study of selective control and motor cerebellar tests. The strength score varies depending on the age of the patient. In children who do not cooperate in cooperation, the measurement of force should be carried out by countering resistance to prosthetic movements that can be obtained by playing with the child. In the collaboration of children under the age of 4, the patient should be placed in the right position and played with it, indicating that he must prevent you from moving it by performing a force contrary to the function of the muscle group to be measured. Children over the age of 4 may have a more selective assessment of muscle groups, explaining the movement that needs to be performed and imposing resistance. Muscle strength is usually measured on the MRC scale, the Medical Research Council (Table III). In cases of minimal muscle weakness, a number of specific tests may be more sensitive to detect weakness, such as: the Barre maneuver: the patient is asked to keep the upper limbs enlarged and in suppination for more than 20 seconds; there is a progressive tendency towards pronation in the light parsia. Gowers maneuver: a patient is asked to get out of the ground without helping himself out of his hands; it is worth remembering that the need to go from supino to prono to stand up is actually the most sensitive part of the test to detect the proximal weakness of the lower limbs. - Walking and processing ratings. In some individual cases, it is advisable to study fatigue. Fatigue is selectively investigated in different muscle groups: in the upper extremities, asymmetry is investigated in force for shoulder theft, after repeatedly raising a heavy object above the head on one side; in the lower extremities, explored repeating the Gowers maneuver; and in the musculature of the eye, keeping the forced look up. Tone is a passive and continuous contraction that is present in the muscles, despite the rest. The decrease in ness tone is mainly valued through posture (reducim kyphosis) and dystal through the assessment of resistance to passive limb mobilization. From a clinical point of view, hypertension is classically classified in: spastic (increased resistance to mobilization, which increases at the speed of joint movement) or dyson (increased mobilization stability that appears or changes with certain postures or movements). It is important to distinguish hypertension from stiffness (constant stability, which appears when bending and expanding the joint) and hypotension from hyperlaxia (lack of soft tissue resistance outside the normal range of motion). Both pairs can occur at the same time in the same joint of the same patient and focus on neurological or muscle problems, but stiffness and hyperlaxity can appear regardless of neurological or muscle problems. As for muscular trophies, the presence of aplasia/atrophy and selective muscular hypertrophy, the presence of dysmetry between the limbs and the consistency of the muscular abdomen are assessed. Osteotendine reflexes can be obtained in any muscle, hitting the tendon that produces a muscular stretch. There are two keys to getting them; On the one hand, the child should be distracted, especially toddlers, creating a pleasant environment, using distractions to draw attention to the other part of his body and upper limbs, passing the blow through the finger of the examiner; on the other hand, it is necessary to pay attention to the position of the muscles, as osteotendinic reflexes appear characteristically when the muscle tendon is moderately enlarged and, therefore, sometimes, it is advisable to ask the patient to perform minimal muscle contraction. The most important osteotendine reflexes and the appropriate method of their implementation are listed in Table IV. Clinical interpretation of the reflex should be integrated with the rest of the scan. Thus, a higher reflection than usual, on a bilateral basis, can be seen as a normal option if we do not find any other data of pyramidalism. If the bilateral reflexogenic area is increased, more caution should be exercised, but despite this, this change should be interpreted in a clinical context. In addition, the decrease in reflexes should be interpreted with other clinical data, as this change is usually accompanied by weakness and hypotension. Otherwise, it is best to consider whether the technique was correct. The link between hyporeflexion and hypotension is also important because it is oriented towards the causal process; peripheral nerve diseases tend to have very noticeable hyporeflexion for the degree of hypotension, while muscle diseases have a lower degree of hyporeflection than hypotension. Reflex asymmetry usually indicates pathology. The most commonly used skin reflexes are the plantar response of the skin and abdominal reflexes. The sole reaction of the skin is performed by a blunt object that slides on the side of the plant's legs and on the over-the-top skin at the head of the metatarsal. The type of response is classified on flexora (this is a normal reaction throughout postpartum life and consists of thumb flexion), indifferent (no thumb movement) and an extension cord (there is a motion extending the big foot and/or flex/opening the fan of the rest of your fingers). Abdominal reflexes are obtained by tickling the nail or clip along the dermatoma to the middle line. It is important to know that their absence can occur in 15% of a healthy population and that they can be asymmetrical. Its importance lies in the location of the spinal injury (less reliable than sensitive examination) and, above all, in the case of suspected siringomyelia in children with scoliosis of unknown cause. Differential diagnosis of motor pathologies by deficiency is based on a comprehensive interpretation of all the traits described so far (table V). During the exam, abnormal movements may occur, the characteristics of which depend on the medical history and data extracted from the physical examination (table VI). The posture score should be adapted to the thick motor maturity of each patient. In those who have not reached the opportunity for placement, the position in supine and prono decubbitous should be evaluated. If you are able to sit but not stand, you should be appreciated sitting. If you have reached the beep, you should stand up and use the Romberg test if the patient is cooperative enough. When assessing posture, we assess: stability, the presence of contracture (distraction of the patient from the anatomical position) and the presence of abnormal movements. Assessment of gait is one of the most informative parts of neurological research. It is convenient to be systematic and rely on recording from your mobile phone. The patient should always be distracted to perform his natural gait and in interpretation, it is very important to correlate the findings with what we described in the static assessment of strength and tone. If the gait seems pathological, it is advisable to formulate the problem in a series of classic patterns (table VII). Evaluation of manipulation is more complex because motion sequences are more complex when integrating the multifay phase (coverage, grip, hand-wringing, transportation and release) and because it must be interpreted in the cognitive context of the patient. Practically, in the clinic, it is explored by pencil clutch pattern in children under 4 years of age and over 4 years of age, the presence of errors, speed disorders or synkinesies in the sequence of touch of each finger with the thumb. The study of selective control is especially important for the manifestation of a very mild pyramidal injury. In patients with poor selective control, while exercising well below the maximum force they can perform, they gain muscles not involved in this movement, causing movement in another joint or counteralateral limb. In clinical practice, it is investigated at the same time that the strength of muscle groups and repeatedly performing a manual clamp on the upper limbs of observation if there is a very noticeable flexion of the rest of the fingers (a certain degree of flexion is normal) or on the wrist. To study the functioning of the cerebellum and the balance system, a number of maneuvers must be performed that require the cooperation of the patient, making their correct assessment complicated in our younger patients: Tandem March: the patient is asked to walk the leg support line in such a way that the advanced heel of the foot contacts delay the legs. Patients with mild imbalances have instability. The heavy involvement of the cerebellum shows instability in a normal gait or sound signal. Romberg test: Compares the degree of

instability of the patient in the sound signal with his feet between the situation with the eyes open and the situation with the eyes closed. Patients with cerebellar involvement have instability in both situations, while patients with vestibular or sensitive participation worsen their instability with their eyes closed. Finger-nose test: this is a method of measuring dysmetry and, above all, intentional tremor. It is important to insist to the child that this is not a speed test, but an accurate test. In patients who do not cooperate on the test or if the degree of change is easily recorded in history, they may be asked to copy the spiral. Finger finger test: It consists of a patient after a browser finger that changes position when the patient reaches it. This is a method of measuring dysmetry. Fast alternating hand movements: The patient is asked to alternately perform movements of pronation and supption on the hip as fast and accurately as he can. Dysdiachokinesia is a method of evaluation of dysdiachokinesia. It can also be affected by dystonia, spasticity patients with dyspraxia. Knee heel test: In the decubbital area, the patient asked for the heel of the contratalteral knee and below, touching the shin. Assesses dysmetry and tremor of the lower extremities. Sensitivity Assessment Is the most subjective element of neurological examination and therefore sensitivity can be difficult to examine even if the patient is an employee. There are different types of sensitivities that reach the brain through different ways. Depending on the purpose of exploration, we will pursue different approaches. In general neurological examination, in pediatrics, only tactile sensitivity is assessed. In a neurological examination in which we are interested in sensitivity, they should be measured: thermo-freezing sensitivity, tactile sensitivity and vibration. To study hegesis sensitivity, it is recommended to use some tool with a tip, which is not able to pass through the skin and which is disposable, for example: an open clip. To implement it properly, various punctures must be performed on the face (after three trigeminal branches), hands and feet. In the event of any changes, a more detailed examination should be done after the territory of inertia of the main nerves and dermat. Heat sensitivity scans can be done with a tube (such as those used to collect urine) filled with hot water and with a cold water pipe. Follow the same approach as geg'sica. Sensory sensitivity is investigated by touching the patient with his finger gently or with a cotton swab. When studying vibrational sensitivity, it is necessary to use a fret board. To implement them, the head fretboard must be struck and placed in the bony fame of the four limbs (usually: tr'clea, maleolos and metacarpal head) and check that the patient notices vibration in a similar way. The nasal nerve of the olfactory nerve evaluation (I): is not usually studied. Optical nerve (II): The visible function and anatomy of nerve and pupil reactions must be studied. Function: The function of the macula (central vision) is investigated by visual acuity and peripheral retina through confrontational campimetry (requires partial patient cooperation) or refjetive reflex (the patient performs a caadic motion to study the object approaching from the peripheral field of vision to the central). The assessment of visual acuity depends on age. In children who can read, this is practically assessed with reading ability, and in young children, it is explored with the ability to manipulate (and detect) small objects. If in doubt or necessary optic nerve functions, more formal methods (oculockinetic nystagmus, Ishihara test...) should be used. Anatomy: researched with direct fondoscopy. This scan depends on the correct technical implementation and practice accumulated in its implementation. The first step is to adjust the ophthalmoscope: you have to remove the glasses, adjust the diopters to be able to read the cover of the book at arm's distance and reduce the brightness. After that, the patient must be prepared by reducing the light in the room (avoiding darkness), place him in a position where he is calm, and ask him to look at a distant object (usually his father's face). The ophthalmoscope is performed by the right hand and is used by the right eye for the patient's right eye. The sequence begins with the search for a red reflection, placing the patient 15 degrees laterally at arm's distance. Then you need to approach the patient in a straight line and increase the brightness to 80-90% of the maximum. You have to look for the disk by turning the ophthalmoscope avoiding moving or moving the ophthalmoscope to the side. The size and color of the sosal (grey in the newborn, yellowish in preschool and asalmonado in the eldest child), edges (usually acute) and the presence of venous pulse (its presence has a high negative predictive value for intracranial hypertension and is investigated stabilization of the hand on the patient's eyebrows and looks for the reflection of moving light on the veins of the retina). Pupil reactions: asymmetry seeks between pupils (anisoria) and afferent pupil defect (anomalies in pupil reactivity). Oculomotor nerves (oculomotor, troclear and abducens): as for eye mobility, the presence of paralysis in the function of any of these nerves (table VIII), the existence of diplopia in different positions of the view and the presence of abnormalities in eye movements should be studied. Trigeminal nerve (V): Scans depend on assessing the sensitivity of its three branches, implementing the corneal reflex (necessary in non-collaborating patients) and studying its motor function by studying mandibular movements. Facial nerve (VII): its central involvement is characterized by loss of voluntary mobility of the lower ipsyliteral hemicara and erasure of the ipsylateral nasal groove. His peripheral involvement is characterized by the loss of voluntary mobility of all hemicaras with the inability to close the palebral and reduce wrinkles on the forehead by raising eyebrows. Satoacusmic nerve (VIII): examination of the auditory component based on the patient's response to auditory stimuli is highly dependent on instrumental methods to be sensitive enough. The vestibular component can be investigated using lobby-eye reflection using a head impulse maneuver that quickly rotates the head around 15o. Glisofaringal nerve (IX): scanned with a sickening reflex. Wandering Nerve (X): Your paresia is clinically detected as weakness in the soft height of the sky when studying orofarix. Spinal nerve accessory (XI): considered by assessing strength against head turn resistance. Hypoglyse nerve (XII): Its bilateral paresia manifests itself as the inability to speak the tongue and its one-sided paresia, like arching the tongue, speaking language. The bibliography Of several Pediatric Neuroscience Guides feature exceptionally good chapters on the study that were used to create this article: 1. Sims K. The Children's Neurology Handbook. Philadelphia, PA: Lippincott Williams and Wilkins; 2014. 2. Forsyth R, Newton RW. Pediatric neurology. Second edition. ed. Oxford, United Kingdom: Oxford University Publishing House; 2012. 3. Haslam RH. Clinical neurological examination of infants and children. The Directory of Clinical Neurology. 2013; 111: 17-25. 4. Pascual Pascual SI. Assessment of maturity in drawing in childhood. I. 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