

Chapter 1 : Neurological History and Physical Examination Publications | PubFacts

Taking a detailed history and performing a careful examination can help the doctor to determine the site of a specific neurological lesion and reach a diagnosis, or at least differential diagnoses. A systematic approach is required. This is a general article, attempting to cover all aspects of.

You can expand or shrink each area as you need to include relevant data for your client. Patient states she has a history of dry macular degeneration and it is being well controlled. Patient uses special eye drops for her eye disease. Admits to blurred vision occasionally. Patient denies any ear problems Last eye infection was over 10 years ago. No discharge noted from ears Nose, Mouth, and Throat discharge, sores or lesions, pain, nosebleeds, bleeding gums, sore throat, allergies, surgeries, usual dental care, medications: Lips pink, mucous membranes pink and moist No discharge or foul odor noted No history of nosebleeds, bleeding gums, allergies or surgeries on nose, mouth or throat. Lymph nodes barely palpable Patient had 4 wisdom teeth removed at age 20 Patient states she flosses daily, and brushes her teeth twice a day with sensodine. No dentures noted No missing teeth. Patient denies any skin disease, any changes in skin, excessive dryness, moisture, itching, any bruising, rashes Patient has thinning hair. Patient uses protective clothing and hats in the sun Patient has an ingrown nail on her left big toe that causes discomfort and goes to a podiatrist to get it looked. Patient does her pedicure every two weeks to have the nail trimmed by professionals. Breasts and Axilla pain or tenderness, lumps, nipple discharge, rash, swelling, trauma or injury to breast, mammography, breast self-exam, medications: Cardiovascular System chest pain or tightness, SOB, cough, swelling of feet or hands, family history of cardiac disease, tire easily, self-history of heart disease, medications: No cardiovascular problems noted Patient states she takes a baby aspirin daily as prescribed by her doctor Patient walks daily for a minimum of 30 minutes. No cough, SOB or pain while breathing No history of lung disease Past smoker of 10 years, Quit when she was 40 years old. Joint and back pain noted after long days working at the Church and in the garden, particularly when in one position for long periods. Limited range of motion in rotator cuff , performs exercises as instructed by physical therapist No accident or trauma to bones Performs activities of daily living independently, just slower. Gastrointestinal System change in appetite “ increase or loss; difficulty swallowing; foods not tolerated; abdominal pain; nausea or vomiting; frequency of BM; history of GI disease, ulcers, medications: Patient has regular daily bowel movements, takes fiber to help No change in appetite No difficulty swallowing foods History of diverticulosis, avoids nuts and seeds Occasional antacid after too much Italian food Genitourinary System recent change, frequency, urgency, nocturia, dysuria, polyuria, oliguria, hesitancy or straining, urine color, narrowed stream, incontinence, history of urinary disease, pain in flank, groin, suprapubic region or low back: Neurological System exam of all 12 cranial nerves, motor and sensory assessments: Limited range of motion in right arm Detects cold and warm touches as well as sensations Able to distinguish smells EOM intact, pupils reactive to light 6 cardinal fields of vision Lifts eye brows, demonstrated facial movements Able to distinguish taste Able to hear sounds Able to swallow, gag reflex in place, moves tongue without difficulty Able to shrug shoulders and ROM of neck Head and Neck palpate the skull, inspect the neck, inspect the face, palpate the lymph nodes, palpate the trachea, palpate and auscultate the thyroid gland: Lymph node palpable, non tender or swollen Trachea midline Eyes test visual acuity, visual fields, extraocular muscle function, inspect external eye structures, inspect anterior eyeball structures, inspect ocular fundus: EOM intact Sclera clear 6 cardinal fields of gaze Known history of dry macular degeneration, unable to detect abnormality of visual assessment. Ears inspect external structure, otoscopic examination, inspect tympanic membrane, test hearing acuity: No drainage noted in ears, minimal wax seen in ears Tympanic membrane seen, pink non ruptured Sounds able to be detected Nose, Mouth, and Throat Inspect and palpate the nose, palpate the sinus area, inspect the mouth, inspect the throat: Skin smooth, non elastic Cool to touch Mucus membranes moist No lesions on scalp Thinning hair Nails short and clean, in growing toenail left toe Breasts and Axilla deferred for purpose of class assignment Peripheral Vascular and Lymphatic System inspect arms, symmetry, pulses; inspect legs, venous pattern, varicosities, pulses, color, swelling, lumps: Carotid arteries palpable JVD “ Apical pulses heard, S1 S2 noted HR 80, NSR Thorax and

Lungs inspect thoracic cage, symmetry, tactile fremitus, trachea; palpate symmetrical expansion; percussion of anterior, lateral and posterior, abnormal breathing sounds: No swelling, mass or deformity noted on spine. Rotator cuff pain when rotated Limited range of motion in right hand related to that Shoulders even, squared No deformity noted in hands, feet, hips Active ROM in legs. Gastrointestinal System contour of abdomen, general symmetry, skin color and condition, pulsation and movement, umbilicus, hair distribution; auscultate bowel sound; percuss all four quadrants; percuss border of liver; light palpation in all four quadrants muscle wall, tenderness, enlarged organs, masses, rebound tenderness, CVA tenderness: Abdomen soft, flat, symmetric Umbilicus shallow and clean Bowel sounds active x4 No tenderness No enlarged organs palpated Negative rebound tenderness Genitourinary System deferred for purpose of this class FHP Assessment Cognitive-Perceptual Pattern: Patient needs corrective lenses Has dry macular degeneration Occasionally back, neck and joint pain from prolonged standing Joint pain related to rotor cuff injury, patient was instructed on exercises to help by physical therapist. Patient eat small meals a day, cuts out heavy meals at night One glass of wine at dinner, nights a week Fiber is increased No seeds and nuts related to diverticulosis Sexuality-Reproductive Pattern: Daily bowel movements Has stress incontinence when coughing or laughing Urinary frequency No diseases Pattern of Activity and Exercise: Participates in church activities 6 days a week Drives but has limited vision at night Pattern of Sleep and Rest: Sleeps hours a night Takes 1 hour nap in afternoon Feels rested when she wakes up in the morning. Pattern of Self-Perception and Self-Concept: Loves herself as she is, uses minimal make up. Has beautiful skin Is very religious and views herself as living a humble life She is grateful for life and all she has been blessed with Summarize Your Findings Use format that provides logical progression of assessment. Situation reason for seeking care, patient statements: August 27th, Situation: Health History and Screening Interview Background health and family history, recent observations: The patient is an 80 year old female who has a history of diverticulosis, dry macular degeneration, injured rotator cuff and frequent stress incontinence. The patient has had yearly physical checkups. Assessment assessment of health state or problems, nursing diagnosis: Patient lives an active lifestyle. She controls her macular degeneration with medication, frequent checkups and surgery. Patient has stress incontinence and seeks further education and instruction. Pain in joints restricts patient from church activities sometimes. She sees a physical therapist. When asked to demonstrate exercise techniques given to do daily by physical therapist she is unable to demonstrate all. Effective Therapeutic Regimen Management as evidenced by thorough management of macular degeneration. Altered Urinary Elimination; Stress Incontinence as evidenced by frequent involuntary urinary elimination when coughing and laughing. Recommendation diagnostic evaluation, follow-up care, patient education teaching including health promotion education: Hygienic recommendations were also given in regards to keeping dry and avoiding infections. Patient demonstrated complete understanding of eye care. Next eye appointment is in 2 months. Physician phone number easily accessible in case of emergency.

Chapter 2 : Neurological history and examination - Oxford Medicine

The neurologic examination is one of the most unique exercises in all of clinical medicine. Whereas the history is the most important element in defining the clinical problem, neurologic examination is performed to localize a lesion in the central nervous system (CNS) or peripheral nervous system (PNS).

Tremor What is done during a neurological exam? The nervous system is very complex and controls many parts of the body. The nervous system consists of the brain, spinal cord, 12 nerves that come from the brain, and the nerves that come from the spinal cord. The circulation to the brain, arising from the arteries in the neck, is also frequently examined. In infants and younger children, a neurological exam includes the measurement of the head circumference. The following is an overview of some of the areas that may be tested and evaluated during a neurological exam: The person will also be observed for clear speech and making sense while talking. Motor function and balance. Balance may be checked by assessing how the person stands and walks or having the patient stand with his or her eyes closed while being gently pushed to one side or the other. This may be done by using different instruments: Newborn and infant reflexes. There are different types of reflexes that may be tested. In newborns and infants, reflexes called infant reflexes or primitive reflexes are evaluated. Each of these reflexes disappears at a certain age as the infant grows. An infant will close his or her eyes in response to bright lights. If the infant is placed on his or her stomach, he or she will make crawling motions. Palmar and plantar grasp. Reflexes in the older child and adult. These are usually examined with the use of a reflex hammer. The reflex hammer is used at different points on the body to test numerous reflexes, which are noted by the movement that the hammer causes. Evaluation of the nerves of the brain. There are 12 main nerves of the brain, called the cranial nerves. During a complete neurological exam, most of these nerves are evaluated to help determine the functioning of the brain: Cranial nerve I olfactory nerve. This is the nerve of smell. The patient may be asked to identify different smells with his or her eyes closed. Cranial nerve II optic nerve. This nerve carries vision to the brain. Cranial nerve III oculomotor. This nerve is responsible for pupil size and certain movements of the eye. Cranial nerve IV trochlear nerve. This nerve also helps with the movement of the eyes. Cranial nerve V trigeminal nerve. This nerve allows for many functions, including the ability to feel the face, inside the mouth, and move the muscles involved with chewing. Cranial nerve VI abducens nerve. This nerve helps with the movement of the eyes. The patient may be asked to follow a light or finger to move the eyes. Cranial nerve VII facial nerve. This nerve is responsible for various functions, including the movement of the face muscle and taste. The patient may be asked to identify different tastes sweet, sour, bitter, asked to smile, move the cheeks, or show the teeth. Cranial nerve VIII acoustic nerve. This nerve is the nerve of hearing. A hearing test may be performed on the patient. Cranial nerve IX glossopharyngeal nerve. This nerve is involved with taste and swallowing. Once again, the patient may be asked to identify different tastes on the back of the tongue. The gag reflex may be tested. Cranial nerve X vagus nerve. This nerve is mainly responsible for the ability to swallow, the gag reflex, some taste, and part of speech. The patient may be asked to swallow and a tongue blade may be used to elicit the gag response. Cranial nerve XI accessory nerve. This nerve is involved in the movement of the shoulders and neck. The patient may be asked to turn his or her head from side to side against mild resistance, or to shrug the shoulders. Cranial nerve XII hypoglossal nerve. The final cranial nerve is mainly responsible for movement of the tongue. The patient may be instructed to stick out his or her tongue and speak. The patient may be asked to walk normally or on a line on the floor. The patient may be instructed to tap his or her fingers or foot quickly or touch something, such as his or her nose with eyes closed.

Chapter 3 : Neurological Examination for Multiple Sclerosis | Cigna

The neurologic examination is one of the most unique exercises in all of clinical medicine. Whereas the history is the most important element in defining the clinical problem, neurologic examination is performed to localize a lesion in the central nervous system (CNS).

Photo by Kevin Berne Today, most neurology residents have had 1 year of internal medicine training, some of which was likely spent in ambulatory neurology settings, while students in internal medicine programs spend less time in neurology training due to duty-hour requirements, said Dr. Advances in neurology have contributed to the need for separate training programs just to keep up with the basic science. Just as internists might feel uncomfortable with neurology, frightened off by their lack of familiarity with the nervous system, the reverse is also true, said Dr. At recent American Academy of Neurology meetings, he noted, neurologists who have become progressively more uncomfortable dealing with heart failure and hypertension sought out courses to better manage these conditions in their patients. Samuels reviewed the workup of patients with neurological symptoms. The most powerful tool in neurology, he said, is the history and physical exam. The neurological exam is the same the world over, Dr. Samuels said, and involves the following touchstones: It would be wasteful in many respects to try to do a complete examination in every patient. Affect is the outward appearance of feeling. Does the patient look frightened, sad, or worried, for example? Thought is the code that a person uses to communicate internally. What are you thinking about, and what is the process? Does the person make sense? You should understand their story. A is connected to B, to C, to D. Consciousness is a measure of wakefulness and alertness and where the patient is on that spectrum. Attentiveness is the ability to maintain a coherent stream of thought or action, and Dr. Samuels conducts the digit span test, a subset of the Mini-Mental State Exam. How many numbers delivered randomly, at 1 per second, can the patient remember forward and backward? The correct answer is about 7 forward and 5 backward. Another test is the Go-No Go protocol. It involves having the patient repeat tapping. Instruct the patient that, when you tap once, he or she should tap twice. The second component of the neurological mental status exam is language. Unlike thought, the internal code, language is the code one person uses to communicate with another, whether it is via speech, writing, or sign language, Dr. The third component, memory, involves 4 aspects: It is a memory that occurs in time; patients know when that memory was acquired and how long it has been kept in mind. Semantic memories spread from the Papez circuit and are stored all over the brain, Dr. For example, he pointed out, George Washington was the first president of the United States, but no one can remember where they learned that. Working memory is the ability to remember 7 objects in a row, such as a phone number. Pavlovian conditioning is another form of memory, but it is not routinely tested as part of the neurological examination, he said. Samuels offered pearls for examining the cranial nerves. An easy way to do this involves looking directly at the second cranial nerve using an ophthalmoscope. Look at the edges of the optic disc, and take a mental picture of the fundus, he said. They react to light: That would be very helpful to people who read the record. If the difference between the size of the pupils increases in bright light, then the small pupil is the abnormal one, indicating a sympathetic nervous system lesion Horner syndrome. The reverse is true in parasympathetic lesion. Then have the patient look up, right, left, and down to test saccades and pursuit. A test that connects the 2 is the corneal reflex. Test it directly and consensually and compare the results to assess facial weakness versus facial sensation, Dr. The eighth cranial nerve is tested by rubbing fingers near the ear and moving them outward to see how acutely the patient can hear. A doctor can also assess air and bone conduction with a tuning fork and compare them to determine whether there is fluid in the middle ear, for example. Long before a doctor might see anything wrong, dysphagia, nasal speech, or a pseudobulbar affect could signal the presence of amyotrophic lateral sclerosis, Dr. Finally, assess the eleventh cranial nerve by asking patients to turn their heads or shrug their shoulders. When assessing power, look for patterns of weakness or asymmetry when moving the limb passively, Dr. Spasticity is a velocity-related stiffness, compared to lead-pipe stiffness, in which a limb is hard to move at all. Hypotonicity is hard to recognize in adults, Dr. Muscle bulk is also hard to assess, especially in muscles that are big and have a lot of fat in them.

Sensory exam The sensory exam is the most difficult part of the neurological exam because there are very few objective tests available, Dr. Patients have to be astute observers to provide useful data, so do not expect too much from them. **Coordination and gait** Observing a patient walking is one of the most useful neurological exams, Dr. In patients who cannot walk, there are surrogate tests, such as the finger-to-nose test. Samuels offered a pearl for addressing the proprioceptive reflexes, which involve how the body knows where something is in space at any single time, by assessing whether muscles are contracted and how much. The 5 proprioceptive reflexes are the biceps, triceps, and brachioradialis in the forearm in the upper extremities and the knee jerk and ankle jerk in the lower extremities. Samuels said he always carries his Babinski hammer with him because he never knows when it might be needed. He applies a finger to the tendons for the biceps, triceps, and forearms, then strikes his finger to assess the muscle and avoid directly striking it. Samuels advised physicians to grade reflexes on scale of 0 to 4. A grade of 0 is scored when there is no reflex. A grade of 1 is scored when extra effort is needed, such as when the Jendrassik maneuver is required to elicit a patellar reflex. A score of 2 is normal, with 1 reflexive jerk per tap, and a score of 3 signals an increased reflexive reaction. A 4 means there is more than 1 jerk per tap. Unfortunately, the note was for a patient no-show visit. Take open-ended histories, and offer the patient no suggestions about symptoms. Psychologist Carl Rogers, PhD, articulated a way of taking a medical history that is useful in general medicine as well as neurology and psychiatry, said Dr. Do you see double? Samuels adds a gesticulation he learned from Freddy, his former Norfolk terrier. When the dog was confused, it offered a head tilt and quizzical look, which Dr. Samuels uses as well. Beware of patients offering an overly medicalized history. This issue is getting worse and worse as patients use the Internet to look up symptoms, Dr. A patient with numbness is worried about multiple sclerosis, or one with migraines is worried about a brain tumor. Physicians need to ask directly where patients have gotten their ideas about possible diagnoses. Know the synonyms for symptoms. Dizziness is often called wooziness or lightheadedness by patients. Is it acute, subacute, chronic, or episodic? For example, a middle-aged woman might wake up in the middle of the night with numbness in the thumb, first and second fingers, and half of the fourth finger that goes away when she shakes her hand. It might be carpal tunnel syndrome, but asking about the progression of the disease could determine whether the cause is actually a C6 radiculopathy, Dr. Avoid heuristic errors and shortcuts to make diagnoses. Common heuristic errors are framing making a diagnosis based on the way the patient is presented to you , anchoring sticking with a diagnosis familiar to you , availability making a diagnosis you may have recently seen or may have previously missed , or blind obedience only relying on tests, for example. Samuels also suggested avoiding questionnaires, which are popular these days.

Chapter 4 : A Practical Guide to Clinical Medicine

A neurological examination is the assessment of sensory neuron and motor responses, especially reflexes, to determine whether the nervous system is impaired. This typically includes a physical examination and a review of the patient's medical history, but not deeper investigation such as neuroimaging.

Examine the cranial nerves. Examine central and peripheral sensory function. Examine cranial and peripheral reflexes. Examine cerebellar function and gait. Students studying Neurological Surgery must adhere to sound principles of clinical medicine. A standard clinical method must be employed with specific evaluation of the history and physical within the context of the nervous system. The symptoms and signs of neurological illness are evaluated by the history and neurological examination, respectively. The first step in acquiring the Neurological History of the Present Illness is determining if the patient is a competent historian. The very nature of the neurological disease may render the history indeterminable or limit the reliability of the history obtained. For example, a patient with significant head trauma with diminished level of consciousness may be unable to give a history. In such instances it is necessary for the neurosurgeon to attempt to obtain history from family members, emergency medical personnel, or other witnesses to the event. Indeed, the evaluation of the trauma patient with disturbed level of consciousness includes evaluation of the level of awareness of the patient including the orientation of the patient to present surroundings and person, place and date the Glasgow Coma Score, which is utilized to rapidly evaluate the level of consciousness in trauma patients, includes three separate categories which records the ability of the patient to respond to the examiner in eye opening, motor examination, and voice, which includes orientation. A careful documentation of the history is recommended, and the simplest method starts with note taking at the bedside or in the office. Immediate recording of the history ensures maximal reliability. If the accuracy of the history is in question, checking details with an observer or informant is desirable. Errors or inconsistencies in the history may be determined in this manner, as the error may be attributable to the physician or surgeon as well as the patient. Careful notation of the mode of onset of the illness, evolution, and time course are made. If the patient is unable to offer this information, the friends, family or employer of the patient may contribute important information. Any changes in the symptoms, and circumstances surrounding such events must be recorded. If the patient is unable to supply the details of these events, it may be necessary to judge the course of the illness by what the patient was able to do and perform at various times during the course of the illness.

e. The Neurologic Examination The neurological examination has already begun during the interview of the patient for the history of the illness. Careful observation of the patient by the neurosurgeon will demonstrate any obvious speech difficulties receptive or expressive, dysarthria, and general motor difficulties. Attention to details and potential inconsistencies of dates or events in the history could suggest some intellectual problems that may be explored further with the neurological examination. The focus and thoroughness of the neurological examination must be tailored to the chief complaint and symptoms manifest by the patient. Furthermore, the examination must be modified by the condition of the patient. A trauma patient with multiple injuries requires a focused and rapid neurological examination to enable the trauma surgeon and the neurosurgeon to prioritize the injuries and proceed with appropriate diagnostic tests and, ultimately, treatment. Such details should be checked with available medical records or with family as appropriate. Any speech or language disorder should be evident during the history taking or examination of higher cortical functioning. These disorders should be explored by testing of reading, writing, spelling, ability to execute spoken commands, name objects and solve simple arithmetic problems.

Cranial Nerve Examination Cranial nerves should be examined in anatomical sequence to ensure complete examination of all nerves. Testing of smell should be performed in each nostril separately, and it should be determined if odors can be discriminated. Soap, coffee, or various spices may be used for this purpose. Careful fundoscopic examination is performed to rule out any evidence of raised intracranial pressure. Inspection of the optic disc will show evidence of flattening or frank papilledema with significantly raised intracranial pressure from a variety of causes, including tumors or hydrocephalus. Visual fields are tested by confrontation, and corrected acuity is tested in each eye. Any abnormalities are further evaluated by formal

tangent screen or computed perimetry testing. Oculomotor function is examined by checking pupillary size bilaterally, and reactivity to light and accommodation. The range of movement, as well as any dysconjugate gaze is noted. Particular attention is paid to limitation of direction of gaze and any diplopia noted by the patient. Facial sensation is then tested with a pin and a wisp of cotton. All 3 divisions of the trigeminal nerve are tested in sequence. In addition, the presence of corneal reflexes is tested, and any asymmetry is noted. Facial movements are tested with the patient speaking, smiling, and frowning. Mild weakness will be noticed upon execution of these maneuvers that may be missed at rest. Hearing is then tested with a Hz tuning fork bilaterally, and any asymmetry is noted. Information from these studies are used to differentiate sensorineuronal from conductive hearing deficits. Audiograms and special tests of auditory and vestibular function are pursued if the bedside testing indicates any abnormalities of eighth nerve function, or diseases of the cochlear or labyrinthine end organs. Any hoarseness of voice is noted, as this may be an indication of vocal cord dysfunction. Pharyngeal sensation is tested bilaterally with the gag reflex. The position of the uvula at rest is noted, and the elevation of the soft palate and uvula is tested. Separate testing of trapezius and sternocleidomastoid muscle strength is performed. Inspection of the tongue at rest is informative, as atrophy and fasciculations may indicate disease of the lingual nerve. The patient is then asked to move the tongue in each lateral direction, and any weakness is recorded.

Motor Function Testing The motor examination should involve a close and complete inspection of all muscle groups. It is important to have the limbs fully exposed, and note any evidence of muscle wasting, or fasciculation. The examiner must be attentive to the speed, strength and coordination of the muscle movements. The patient should maintain the arms outstretched in the prone and supine positions, and accomplish simple tasks such as buttoning clothes, opening a safety pin, or picking up simple objects. The strength of the legs may be similarly tested, with the patient supine and the legs flexed at the hips and knees, or prone with the knees bent. An attempt must be made to test muscle function in the position of function if possible. For example, only testing of gastrocnemius and soleus strength while ambulating will help the examiner determine if the patient has any mild loss of function. For this reason, estimates of the strength of leg muscles in bed are highly unreliable. All individual muscle group strength is recorded for the medical record. Testing of the motor system should also include careful observation for any movement disorder, disorder of posture e.

Sensory Function Testing This is the most time-consuming and difficult part of the neurological examination. Sensory testing must be carried out in all extremities, and with multiple modalities. A quick survey of all regions with light touch and pin will determine if any gross abnormalities exist which should then be more carefully mapped out. Movement from an area of diminished sensation to one of normal enhances the perception of a difference. Any sensory disturbance must be examined in detail, to enable the examiner to differentiate anatomically the disorder. An understanding of sensory disorders depends on knowledge of functional anatomy. The sense of touch is usually tested with a wisp of cotton. The examiner will ask the patient to state "yes" when the stimulus is applied to various parts of the body. Cornified areas of the body, such as the soles and the palms will require more of a stimulus to evoke a response. On the contrary, glabrous areas of the skin may be more sensitive to stimulus because of the numerous nerve endings around the hair follicles. Pain is usually assessed by pinprick or pinwheel. It is almost impossible to consistently apply equal pressure with pin testing. The boundaries of any diminished region of sensation must be delineated carefully. Deep pressure-pain may be tested by pinching or pressing deeply on the tendons or muscles. Thermal sense may be tested in all extremities. It must be remembered that the perception of thermal stimuli may be delayed, and dependent upon the size of the object used to test the temperature sensation. Glass tubes filled with warm or cold water are useful for testing temperature. Any difference in temperature testing between the proximal or distal extremities is noted, which may indicate peripheral nerve disease. Perception of passive motion is first tested in the fingers and toes, since any deficit will be first noted in these regions most sensitive testing. Any evidence of loss of position sense in these regions would then dictate more proximal position sense testing. Vibration testing is performed by using a low rate and long duration of vibration Hz over bony prominences. The patient must be attentive to the vibration, and not merely the pressure sensation. Vibration sense and position sense are usually lost together, although vibration sense may be affected disproportionately. Vibration is most commonly diminished at the toed and

ankles. Discriminative sensory functions are tested after completion of the above primary sensory functions. Tests such as two-point discrimination, graphesthesia, and appreciation of texture, size, and shape is dependent upon functional sensory cortex or thalamo-cortical projections. Any disturbance of position sense with intact primary sensory function, or, if a cerebral lesion is suspected on other grounds, would dictate a careful testing of discriminative sensory function. The anatomic pattern of the sensory loss, such as dermatomal in pattern, a distribution of peripheral nerve, or "stocking and glove" must be noted. Any spinal level of sensory loss is documented. Careful documentation of the laterality of loss and modalities involved may give indication as to the potential nature of a spinal lesion.

Reflex Function Testing In testing tendon reflexes, it is essential that muscle groups be relaxed. Barely elicitable reflexes can be facilitated by voluntary contraction of other muscle groups Jendrassik maneuver. Testing of the biceps, pectoralis, triceps, supinator, patellar, Achilles, plantar and cutaneous abdominal reflexes comprises adequate testing of the sampling of reflex activity of the spinal cord. Careful elicitation of the plantar response can be evoked by stimulating the sole of the foot along its outer border from heel to the toes. The examiner must be aware that plantar responses may be confounded because of a high level avoidance response, and withdrawal responses may interfere with the interpretation of the Babinski sign. An abnormality of gait and stance may be the only neurological abnormality in cases of frontal lobe or cerebellar lesions.

Chapter 5 : NEUROLOGICAL EXAMINATION OF THE LIMBS | Clinical Gate

A detailed neurological history allows the physician to determine where the lesion is within the nervous system, the nature of the pathological process, and which physical signs to look for when examining the patient.

EOM intact, no gaze preference or deviation, no nystagmus. Rt facial weakness VIII: No signs of resp distress, on room air ABD: The patient is alert, attentive, and oriented to time, place and person. Visual fields are full to confrontation. Fundoscopic exam is normal with sharp discs. Pupils are 4 mm and briskly reactive to light. Facial sensation is intact to pinprick in all 3 divisions bilaterally. Face is symmetric with normal eye closure and smile. Tongue is midline with normal movements and no atrophy. There is no pronator drift of out-stretched arms. Muscle bulk is normal. Tone is increased rigidity in both upper and lower extremities and around the neck. Plantar responses are flexor. Light touch, pinprick, position sense, and vibration sense are intact in fingers and toes. Rapid alternating movements and fine finger movements are intact. There is no dysmetria on finger-to-nose and heel-knee-shin. There are no abnormal or extraneous movements. Romberg test is negative. Stooped posture, short steppage gait with decreased arm associative movements. Turns in block but no gait freezing.

Chapter 6 : Neurology OSCEs Exam

The history of the neurologic exam is therefore a consequence of the history of neuroanatomy and clinical neurophysiology. There was an exponential expansion of knowledge in the anatomy, physiology, pathology, and clinical aspects of the neurosciences in the s (66).

By the end of the history, you should have a clear picture of the person, their problem, and the likely etiologies. The history is also how we learn about disease and how it affects people. Reading a textbook can never replace personally hearing the story and examining multiple people with a certain disease. View each experience as a chance to learn more about a disease process, and to make personal observations that will be memorable. A proper history takes time, typically at least minutes, longer for more complex and acutely ill patients. Always sit-down when speaking to patients, and ensure their comfort and privacy. Ask open-ended questions and do not interrupt. Begin by eliciting their chief complaints. Note the symptoms so you can return to each of these to get the necessary details. If you interrupt after the first, you may not get back to the rest. Ask clarifying questions where appropriate, because your vocabulary may differ from the patient. While we understand vertigo and dizziness to mean different things, patients may not have that distinction. Please describe that more so I could better understand. If they go on a tangent, use a redirecting question. The redirecting question lets the patient know that they said something important, and more information is required. Please tell me more about the circumstances and what you experienced. Think of how you can acknowledge their frustration while stressing the importance of reviewing the history once again. Let them know that you want to hear what happened directly from them. I really want to hear about your problems directly from you, so I can best understand what is happening. Direct questions often reflect your bias towards a particular disease, and at this stage of gathering the data, you must keep an open mind. When you shift to a yes-or-no question format, the interview will be compromised because the patient now believes you know exactly what is important. Occasionally, some patients simply do not elaborate upon their answers. How you ask something is also crucial. These might include family, the nurse at the nursing facility, the manager at work who witnessed the seizure, etc. Patients with impaired consciousness or attention, those with seizures, and those with dementia always need an additional informant. The history is incomplete until you track down all available sources. Your job is to recreate a chronological line of all their symptoms starting from the very beginning. If someone has had MS for 10 years, and they are coming in with an exacerbation over the past 2 weeks, then their history really begins 10 years ago. Delve into each symptom to obtain all the details. Include historical details when informative, such as what they were doing at the time. You want to ask how things resolved. If they fell, were they able to get up by themselves, did they have to lay there for 2 hours until someone came in, or did they have to crawl over to the phone to call someone. Quantify whenever possible " how many times did they fall last year, how many times did they fall this year. Include hard measures of disability " 3 years ago they started using a walker, last year they started to use a wheelchair, this year they cannot transfer out of the wheelchair without assistance. Inquire on how the symptoms have led to changes in work, relationships, taking care of the home, and in hobbies and travel. Did you notice any slurred speech, or did anyone mention that your face was also weak? Did you have any trouble speaking or understanding? Did you have any shaking or tremor? One needs to be very cautious about interpreting the perceived benefits of prescribed treatments, because disease can fluctuate and medicines have placebo effects. Do not assume the existing diagnosis to be the correct one. Perhaps the diagnosis was made years ago, but new symptoms suggest a different disorder. You also need to have a sense of the patients social and support structure. If someone lives on the 5th floor of an apartment without an elevator, then this is important. Lastly, a good history will provide clues as to what you will find during the exam. If they are complaining of stiffness and weakness in the legs, then you would expect brisk reflexes and weakness. If they are complaining of numbness of the hand, ask them whether it is the whole hand or just part of it. If they are having double vision, ask if it is worse looking in a certain direction, and how are the 2 objects oriented. By the end of the history, you should have a clear picture of their symptoms and how they have unfolded over time. You should also have some hypotheses

about what you will find on exam and a start to your differential. You should also have some inside knowledge about who is this person, how has their disease affected them, and what is their social support and living situation.

Chapter 7 : Neurological Examination OSCE guides | Geeky Medics

The Neurological History. The history is the most important part of your work-up. By the end of the history, you should have a clear picture of the person, their problem, and the likely etiologies.

The patient is a year-old right-handed woman with a history of chronic headaches who complains of acute onset of double vision and right eyelid droopiness three days ago. History of present illness: When she looked up at the clock on the wall, she had a hard time making out the numbers. At the same time, she also noted a strange sensation in her right eyelid. She went to bed and upon awakening the following morning, she was unable to open her right eye. When she lifted the right eyelid with her fingers, she had double vision with the objects appearing side by side. The double vision was most prominent when she looked to the left, but was also present when she looked straight ahead, up, down, and to the right, and went away when she closed either of her eyes. She also noted that she had pain in both of her eyes that increased if she moved her eyes around, especially on looking to the left. Smith also notes that for the past two to three weeks, she has been having intermittent pounding bifrontal headaches that worsen with straining, such as when coughing or having a bowel movement. The headaches are not positional and are not worse at any particular time of day. She rates the pain as 7 or 8 on a scale of 1 to 10, with 10 being the worst possible headache. The pain lessened somewhat when she took Vicodin that she had lying around. She denies associated nausea, vomiting, photophobia, loss of vision, seeing flashing lights or zigzag lines, numbness, weakness, language difficulties, and gait abnormalities. She has never taken anything for these headaches other than ibuprofen or Vicodin, both of which are partially effective. The last headache of that type was two months ago. Her visual symptoms have not changed since the initial presentation. She denies previous episodes of transient or permanent visual or neurologic changes. She denies head trauma, recent illness, fever, tinnitus or other neurologic symptoms. She is not aware of a change in her appearance, but her husband notes that her right eye seems to protrude; he thinks that this is a change in the last few days. Migraine headaches, as described in HPI. There is no history of diabetes or hypertension. Zoloft 50 mg daily, ibuprofen mg a few times per week, and Vicodin a few times per week. The patient lives with her husband and year-old daughter in a 2-story single-family house and has worked as a medical receptionist for 25 years. She denies tobacco or illicit drug use and rarely drinks a glass of wine. Her mother had migraines and died at the age of 70 after a heart attack. Her maternal grandfather had a stroke at age She states that she had an upper respiratory infection with rhinorrhea, congestion, sore throat, and cough about 6 weeks ago. She denies fever, chills, malaise, weight loss, neck stiffness, chest pain, dyspnea, abdominal pain, diarrhea, constipation, urinary symptoms, joint pain, or back pain. Neurologic complaints as per HPI. The patient is obese but well-appearing. There is no tenderness over the scalp or neck and no bruits over the eyes or at the neck. There is no proptosis, lid swelling, conjunctival injection, or chemosis. Cardiac exam shows a regular rate and no murmur. The patient is alert, attentive, and oriented. Speech is clear and fluent with good repetition, comprehension, and naming. Visual fields are full to confrontation. Fundoscopic exam is normal with sharp discs and no vascular changes. Venous pulsations are present bilaterally. Pupils are 4 mm and briskly reactive to light. At primary gaze, there is no eye deviation. When the patient is looking to the left, the right eye does not adduct. When the patient is looking up, the right eye does not move up as well as the left. She develops horizontal diplopia in all directions of gaze especially when looking to the left. There is ptosis of the right eye. Facial sensation is intact to pinprick in all 3 divisions bilaterally. Corneal responses are intact. Face is symmetric with normal eye closure and smile. Tongue is midline with normal movements and no atrophy. There is no pronator drift of out-stretched arms. Muscle bulk and tone are normal. Strength is full bilaterally.

Chapter 8 : Neurological History and Examination. Neuro History Info | Patient

The neurological history and exam allows the examiner to pinpoint various areas of the brain or nervous system that may be dysfunctional. Specific signs and symptoms manifested by your patient are associated with specific areas of the.

Testing of motor and sensory function requires a basic understanding of normal anatomy and physiology. Voluntary movement begins with an impulse generated by cell bodies located in the brain. Signals travel from these cells down their respective axons, forming the Corticospinal tract. At the level of the brain stem, this motor pathway crosses over to the opposite side of the body and continues downward on that side of the spinal cord. A discussion of these tracts can be found in other Neurology reference texts. For more information about motor pathways, see the following link: [The precise location of the synapse depends upon where the lower motor neuron is destined to travel.](#) If, for example, the LMN terminates in the hand, the synapse occurs in the cervical spine. The axons of the PNS travel to and from the periphery, connecting the organs of action. Nerves which carry impulses away from the CNS are referred to as Efferents. Axons that exit and enter the spine at any given level generally connect to the same distal anatomic area. These bundles of axons, referred to as spinal nerve roots, contain both afferent and efferent nerves. For more information about spinal cord anatomy, see the following link: [Review of Spinal Anatomy](#) As the efferent neurons travel peripherally, components from different roots commingle and branch, following a highly programmed pattern. Ultimately, contributions from several roots may combine to form a named peripheral nerve, which then follows a precise anatomic route on its way to innervating a specific muscle. The Radial Nerve, for example, travels around the Humerus bone of the upper arm, contains contributions from Cervical Nerve Roots 6, 7 and 8 and innervates muscles that extend the wrist and supinate the forearm. It may help to think of a nerve root as an electrical cable composed of many different colored wires, each wire representing an axon. As the cable moves away from the spinal cord, wires split off and head to different destinations. Prior to reaching their targets, they combine with wires originating from other cables. The group of wires that ultimately ends at a target muscle group may therefore have contributions from several different roots. For more information about radial nerve anatomy and function, see below. Afferents carry impulses in the opposite direction of the motor nerves. That is, they bring information from the periphery to the spinal cord and brain. Sensory nerves begin in the periphery, receiving input from specialized receptor organs. The axons then move proximally, joining in a precise fashion with other axons to form the afferent component of a named peripheral nerve. The Radial Nerve, for example, not only has a motor function described previously but also carries sensory information from discrete parts of the hand and forearm. As the sensory neurons approach the spinal cord, they join specific spinal nerve roots. Each root carries sensory information from a discrete area of the body. The area of skin innervated by a particular nerve root is referred to as a dermatome. Dermatome maps describe the precise areas of the body innervated by each nerve root. These distributions are more or less the same for all people, which is clinically important. In the setting of nerve root dysfunction, the specific area supplied by that root will be affected. This can be mapped out during a careful exam, identifying which root is dysfunctional. To view a dermatomal map, see the following link: [Dermatome Map University of Scranton](#) Sensory input travels up through the spinal cord along specific paths, with the precise route defined by the type of sensation being transmitted. Nerves carrying pain impulses, for example, cross to the opposite side of the spinal cord soon after entering, and travel up to the brain on that side of the cord. Vibratory sensations, on the other hand, enter the cord and travel up the same side, crossing over only when they reach the brain stem. See following sections for detailed descriptions. For more information about sensory pathways, see the following link: [University of Washington Review of Sensory Pathways](#) Ultimately, the sensory nerves terminate in the brain, where the impulses are integrated and perception occurs. Understanding the above neuro-anatomic relationships and patterns of innervation has important clinical implications when trying to determine the precise site of neurological dysfunction. Injury at the spinal nerve root level, for example, will produce a characteristic loss of sensory and motor function. This will differ from that caused by a problem at the level of the peripheral nerve. An approach to localizing lesions on the basis of motor and sensory findings

is described in the sections which follow. Realize that there is a fair amount of inter-individual variation with regards to the specifics of innervation. Also, recognize that often only parts of nerves may become dysfunctional, leading to partial motor or sensory deficits. As such, the patterns of loss are rarely as "pure" as might be suggested by the precise descriptions of nerves and their innervations. Sensory Testing Sensory testing of the face is discussed in the section on Cranial Nerves. Testing of the extremities focuses on the two main afferent pathways: Spinothalamic and Dorsal Columns. These nerves detect pain, temperature and crude touch. They travel from the periphery, enter the spinal cord and then cross to the other side of the cord within one or two vertebral levels of their entry point. They then continue up that side to the brain, terminating in the cerebral hemisphere on the opposite side of the body from where they began. These nerves detect position. They travel from the periphery, entering the spinal cord and then moving up to the base of the brain on the same side of the cord as where they started. Upon reaching the brain stem they cross to the opposite side, terminating in the cerebral hemisphere on the opposite side of the body from where they began. A screening evaluation of these pathways can be performed as follows: To do this, break a Q-tip or tongue depressor in half, such that you create a sharp, pointy end. Alternatively, you can use a disposable needle or the sharp and blunt ends of a safety pin. I would discourage the use of the pointy, metal spikes that accompany some reflex hammers. Better to use a disposable implement. Ask the patient to close their eyes so that they are not able to get visual clues. Start at the top of the foot. Orient the patient by informing them that you are going to first touch them with the sharp implement. Then do the same with a non-sharp object. This clarifies for the patient what you are defining as sharp and dull. Now, touch the lateral aspect of the foot with either the sharp or dull tool, asking them to report their response. If they give accurate responses, do the same on the other foot. The same test can be repeated for the upper extremities. As such, it contributes to balance. Similar to the Spinothalamic tracts, disorders which affect this system tend to first occur at the most distal aspects of the body. Thus, proprioception is checked first in the feet and then, if abnormal, more proximally. Ask the patient to close their eyes so that they do not receive any visual cues. With one hand, grasp either side of great toe at the interphalangeal IP joint. Place your other hand on the lateral and medial aspects of the great toe distal to the IP. Orient patient to up and down as follows: Testing Proprioception Alternately deflect the toe up or down without telling the patient in which direction you are moving it. They should be able to correctly identify the movement and direction. Both great toes should be checked in the same fashion. If normal, no further testing need be done in the screening exam. Similar testing can be done on the fingers. Vibratory sensation travels to the brain via the dorsal columns. Thus, the findings generated from testing this system should corroborate those of proprioception see above. Start at the toes with the patient seated. You will need a 128 Hz tuning fork. Grasp the tuning fork by the stem and strike the forked ends against the floor, causing it to vibrate. Place the stem on top of the interphalangeal joint of the great toe. Put a few fingers of your other hand on the bottom-side of this joint. Testing vibratory sensation Ask the patient if they can feel the vibration. You should be able to feel the same sensation with your fingers on the bottom side of the joint. The patient should be able to determine when the vibration stops, which will correlate with when you are no longer able to feel it transmitted through the joint. It sometimes takes a while before the fork stops vibrating. If you want to move things along, rub the index finger of the hand holding the fork along the tines, rapidly dampening the vibration. Repeat testing on the other foot. Patients should normally be able to distinguish simultaneous touch with 2 objects which are separated by at least 5mm. These stimuli are carried via the Dorsal Columns. While not checked routinely, it is useful test if a discrete peripheral neuropathy is suspected. Testing can be done with a paperclip, opened such that the ends are 5mm apart. The patient should be able to correctly identify whether you are touching them with one or both ends simultaneously, along the entire distribution of the specific nerve which is being assessed. Special Testing for Early Diabetic Neuropathy: A careful foot examination should be performed on all patients with symptoms suggestive of sensory neuropathy or at particular risk for this disorder.

Chapter 9 : Keys to taking a neurological history | ACP Internist

This article explains the dermatomes and myotomes of the human body, with an included dermatome map. Examining myotomes and dermatomes is a vital part of a thorough neurological examination, particularly when a patient has a spinal cord injury.

Gale Encyclopedia of Medicine, 3rd ed. It is a systematic examination that surveys the functioning of nerves delivering sensory information to the brain and carrying motor commands. Peripheral nervous system and impulses back to the brain for processing and coordinating Central nervous system. Purpose A careful neurological evaluation can help to determine the cause of impairment since a clinician can begin localizing the problem. Symptoms that occur unexpectedly suggest a blood vessel or seizure problem. Those that are not so sudden suggest a possible tumor. Symptoms that have a waning course with recurrences and worsen over time suggest a disease that destroys nerve cells. Others that are chronic and progressive indicate a degenerative disorder. In cases of trauma, symptoms may be evident upon inspection and causes may be explained by third party witnesses. The NH will assist the clinician to diagnose illnesses such as seizure disorders, narcolepsy, migraine disorders, dizziness, and dementia. Description A neurological screening is an essential component of every comprehensive physical examination. In cases of neurological trauma, disease, or psychological disorders patients are usually given a very in-depth neurological examination. The examination is best performed in a systematic manner, which means that there is a recommended order for procedures. Neurological screening examination The NSE is basic procedure especially in patients who have a general neurological complaint or symptoms. The NSE consists of six areas of assessment: The NE is performed in a systematic and comprehensive manner. The NE consists of several comprehensive and in-depth assessments of mental status, cranial nerves, motor examination, reflexes, sensory examination, and posture and walking gait analysis. There are two types of MSE, informal and formal. The informal MSE is usually done when clinicians are obtaining historical information from a patient. The formal MSE is performed in a patient suspected of a neurological problem. Retentive memory capability and immediate recall can be assessed by determining the number of digits that can be repeated in sequence. Recent memory is typically examined by testing recall potential of a series of objects after defined times, usually within five and 15 minutes. Remote memory can be assessed by asking the patient to review in a coherent and chronological fashion, his or her illness or personal life events that the patient feels comfortable talking about. Patient recall of common historical or current events can be utilized to assess general knowledge. Higher functioning referring to brain processing capabilities can be assessed by spontaneous speech, repetition, reading, naming, writing, and comprehension. The patient may be asked to perform further tasks such as identification of fingers, whistling, saluting, brushing teeth motions, combing hair, drawing, and tracing figures. These procedures will assess the intactness of what is called dominant left-sided brain functioning or higher cortical function referring to the portion of the brain that regulates these activities. The MSE is particularly important in the specialty of psychotherapy. Psychotherapists recommend an in-depth MSE to all patients with possible organic referring to the body or psychotic disorders. This examination is also performed in a systematic and orderly manner. It is divided into several categories: Patients who exhibit latent or delayed speech can indicate depression, while a rapid or pressured speech may suggest possible mania or anxiety. Normal mood is term euthymia. There is variation in mood presentations and patients may display a flat, labile, blunted, constructed or inappropriate mood. The patient can also be euphoric elevated or dysphoric on the down side. Thought processes and content: This category is typically assessed by determining word usage can indicate brain disease, thought stream whether thoughts are slow, restricted, blocked, or overabundant, continuity of thought referring to associations among ideas, and content of thought delusional thoughts. Certain psychological states may cause hearing and visual hallucinations. Impairments of smell and touch are usually caused by medical organic causes or as side effects from certain medications. Abnormalities in attention and concentration can indicate problems related to anxiety or hallucinations. Disturbances in orientation can be due to a medical condition other than psychological, substance abuse, or as a side effect of certain medications such as those used to treat

depression, anxiety or psychosis since these medications usually have a sedative affect. Patients are examined for remote, recent, and immediate memory capabilities. Immediate memory can be tested by naming three objects and asking the patient to repeat the named objects immediately, then after five and 15 minute intervals. It also determines whether the patient has an understanding of consequences associated with their actions. Insight concerning the present illness can range from denial to fleeting admission of current illness. Cranial nerves are specialized nerves that originate in the brain and connect to specialized structures such as the nose, eyes, muscles in the face, scalp, ear, and tongue. This nerve checks for visual capabilities. Patients are usually given the Snellen Chart a chart with rows of large and small letters. Patients read letters with one eye at a time. These nerves examine the pupillary the circular center structure of the eye that light rays enter reaction. The pupils get smaller, normally when exposed to the light. The eyelids are also examined for drooping or retraction. The eyeball is also checked for abnormalities in movement. The clinician can assess the muscles on both sides of the scalp muscles the temporalis muscle. Additionally the jaw can be tested for motion resistance, opening, protrusion, and side-to-side mobility. The cornea located is a transparent tissue covering the eyeball and could be tested for intactness by lightly brushing a wisp of cotton directly on the outside of the eye. The patient is asked to raise eyebrows, wrinkle forehead, close eyes, frown, smile, puff cheeks, purse lips, whistle, and contract chin muscles. Taste for the front and middle portions of the tongue can also be examined. Testing for this CN deals with hearing. The clinician usually uses a special instrument called a tuning fork and tests for air conduction and structural problems which can occur inside the ear. CN IX and X: These tests will evaluate certain structures in the mouth. The clinician will usually ask the patient to say "aah" and can detect abnormal positioning of certain structures such as the palatovelum. The examiner will also assess the sensation capabilities of the pharynx, by stimulating the area with a wooden tongue depressor, causing a gag reflex. This nerve is usually examined by asking the patient to shrug shoulders testing a muscle called the trapezius and rotating the head to each side testing a muscle called the sternocleidomastoid. These muscles are responsible for movement of the shoulders and neck. The test is usually done with resistance, meaning the examiner holds the area while the patient is asked to move. This nerve tests the bulk and power of the tongue. Muscles could be abnormally larger than expected hypertrophy or small due to tissues destruction atrophy. It is important to assess if there is evidence of twitching or abnormal movements. Involuntary movements due to tics or myoclonus can be observed. Muscle tone is usually tested by applying resistance to passive motion of a relaxed limb. Power is assessed for movements at each joint. Decreases or increases in muscle tone can help the examiner localize the affected area. The clinician will tap the rubber triangular shaped end in several different areas in the arms, knee, and Achilles heel area. The clinician will ask the patient to relax and gently tap the area. If there is a difference in response from the left to right knee, then there may be an underlying problem that merits further evaluation. A difference in reflexes between the arms and legs usually indicates of a lesion involving the spinal cord. Depressed reflexes in only one limb, while the other limb demonstrates a normal response usually indicates a peripheral nerve lesion. Although a very essential component of the NE, the sensory examination is the least informative and least exacting since it requires patient concentration and cooperation. Five primary sensory categories are assessed: Patients who have sensory abnormalities may have a lesion above the thalamus. Spinal cord lesions or disease can possibly be detected by pinprick and temperature assessment. Coordination can also be assessed by asking the patient to alternate tapping the palm then the back of one hand on the thigh. For coordination in the lower extremities on legs, the patient lies on his or her back and is asked to slide the heel of each foot from the knee down the shin of the opposite leg and to raise the leg and touch the examiners index finger with the great toe. Normal walking is a complex process and requires usage of multiple systems such as power, coordination and sensation working together in a coordinated fashion. The examination of gait can detect a variety of disease states. Decreased arm swinging on one side is indicative of corticospinal tract disease. A high stepped, slapping gait may be the result of a peripheral nerve disease. Preparation The MSE is the first step in a continuous assessment to determine the diagnosis a psychotherapist should take a detailed medical history in the process of ruling out a general medical condition. If a general medical disease is suspected, referral is indicated to rule out this category. Once a medical condition has been fully excluded the therapist can then localize the components of an

abnormal MSE to determine the underlying psychological disorder. For neurological diseases the clinician will use information gained from the NE for ordering further tests. These tests may include a complete blood analysis, liver function tests, kidney function tests, hormone tests, and a lumbar puncture to determine abnormalities in cerebrospinal fluid. In cases of trauma car accident, sports injury the NE is a quick and essential component of emergency assessment. Aftercare Care is usually specific once the final diagnosis has been determined. In causes of an acute insult such as stroke or trauma, the patient is usually admitted to the hospital for appropriate treatment. Some neurological diseases are chronic and require conservative medical treatment and frequent follow-up visits for monitoring and stability or progression of the disease state. Further testing using advanced technological procedures is usually required for definitive diagnosis and initiation of disease-specific treatment. The outcome depends ultimately on the final diagnosis.