TABLE 27-1
Neurologic Diagnostic Procedures

Test	Description	Purpose	Comments
Lumbar puncture (LP)	Spinal needle is inserted between L3 and L4 or L4 and L5 vertebral spaces into subarachnoid space; CSF pressure is measured, and sample is collected for examination.	Measures spinal fluid pressure Obtains CSF for laboratory analysis Injection of medication	Contraindicated in patients with increased ICP or infected skin over puncture site.
Subdural tap	Needle is inserted into anterior fontanel or coronal suture (midline to pupil).	Helps rule out subdural effusions Removes CSF to relieve pressure	Place infant in semi-erect position after subdural tap to minimize leakage from site; prevent child from crying if possible. Check site frequently for evidence of leakage.
Ventricular puncture	Needle is inserted into lateral ventricle via coronal suture (midline to pupil).	Removes CSF to relieve pressure	Risk of intracerebral or ventricular hemorrhage.
Electroencephalogram (EEG)	EEG records changes in electrical potential of brain. Electrodes are placed at various points to assess electrical function in a particular area. Impulses are recorded by electromagnetic pen or digitally.	Detects spikes, or bursts of electrical activity that indicate the potential for seizures Used to determine brain death	Patient should remain quiet during procedure; may require sedation. Minimize external stimuli during procedure.
Nuclear brain scan	Radioisotope is injected intravenously then counted and recorded after fixed time intervals. Radioisotope accumulates in areas where blood–brain barrier is defective.	Identifies focal brain lesions (e.g., tumors, abscesses) Positive uptake of material with encephalitis and subdural hematoma Visualizes CSF pathways	Requires IV access; patient may require sedation. In normal children or noncommunicating hydrocephalus, no retrograde filling of ventricles occurs. Areas of concentrated uptake of material are termed *hot spots*.
Encephalography	Pulses of ultrasonic waves are beamed through head; echoes	Identifies shifts in midline structures from their normal	Simple, safe, rapid procedure.