Approach to the Neurological Exam

General Tips

- Observation is key, especially for infants/toddlers!
- Majority of the exam can be performed in the parent's lap
- Make the exam fun to increase effort!
- Don't forget to ask about developmental milestones

Vitals & General Appearance

- ❑ Stable? Well vs. Unwell?
- ❑ AVPU (alert, verbal, pain, unresponsive) or GCS

If concerned, **STOP** and get additional help!

- ❑ Growth + head circumference
- ❑ Head shape, sutures & dysmorphic features
- ❑ Neurocutaneous findings

Cranial Nerves

CN	Function	Exam
I	Smell	Rarely tested
II	Vision	Fix & follow/ blink to light or acuity*, visual fields, fundoscopy, pupillary response (CN II/III)
III, IV, VI	Extraocular movements	Observe for symmetry/ptosis, follow toy/finger in "H" pattern
V	Face sensation	Response to touch, jaw clench*
VII	Facial movements	Symmetry, raise eyebrows, eye closure, smile, puff out cheeks
VIII	Hearing, balance	Response to sound or whisper test*
IX, X	Swallow, gag	Cry quality, swallow, uvula elevation
XI	SCM / trapezius	Shrug, head turn
XII	Tongue movement	Stick out tongue (observe if midline/fasciculations)

* age-dependent

Reflexes

Primitive *(Age the Reflex Disappears)*	❑ Stepping *(2-3 mo)* ❑ Rooting *(2-3 mo)* ❑ Tonic Neck *(3 mo)* ❑ Moro *(5-6 mo)* ❑ Palmar Grasp *(5-6 mo)* ❑ Plantar Grasp *(9-12 mo)*
Deep Tendon *(Nerve Root)*	❑ Biceps *(C6)* ❑ Brachioradialis *(C6)* ❑ Triceps *(C7)* ❑ Patella *(L3/4)* ❑ Achilles *(S1)*

Grading: 0 = absent, 1+ = requires reinforcement, 2+ = "normal", 3+ = spread, 4+ = clonus
→ *up to 4 beats of symmetrical clonus is normal*

Motor

Observation	❑ Resting posture ❑ Symmetry of movements ❑ Muscle bulk ❑ Fasciculations/atypical movements
Tone	❑ Central tone including head control, ventral & vertical suspension ❑ Peripheral tone ❑ Velocity-dependent (ie. spasticity) & independent
Strength	**Upper Extremity:** ❑ Shoulder ABduction *(C5)* ❑ Elbow flexion *(C5/6)* & extension *(C7)* ❑ Wrist flexion *(C7/8)* & extension *(C6/7)* ❑ Finger PIP flexion *(C8)* & MCP extension *(C7/8)* ❑ Pinky & thumb ABduction *(C8/T1)* **Lower Extremity:** ❑ Hip flexion *(L2)*, ABduction *(L4/5)* & extension *(L5/S1)* ❑ Knee flexion *(L5/S1)* & extension *(L3/4)* ❑ Ankle dorsiflexion *(L4/5)*, plantar flexion *(S1)* & inversion/eversion *(L5)* ❑ Great toe extension *(L5)*
Special Tests	❑ Pronator Drift

Grading: 0/5 = none, 1/5 = flicker, 2/5 = gravity gone, 3/5 = against gravity, 4/5 = some resistance, 5/5 = "normal"

Tip: In infants look for symmetrical movement against gravity; in toddlers observe while playing!

Sensation

- ❑ Often inaccurate in children. Check for response to light touch centrally and peripherally.
- ❑ If > 5-6 yo, can test upper and lower extremity nerve distributions in the same manner as adults.
- ❑ If sensory concerns, localize with pain, temperature, vibration & proprioception.

Gait & Coordination

- ❑ **Gait:** including toe/heel walking & tandem gait (≥ 8 yo) + balance on one foot (# of seconds = age)
- ❑ **Dysmetria:** finger to nose (observe infants/toddlers bringing toys to their mouth)
- ❑ **Dysdiadokinesia:** rapid alternating movements

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