Neurological Assessment of the School Age Child©

Nadine Nielsen, ARNP, CPNP

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Program Handouts

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Neurological Assessment of the School Age Child

Nadine Nielsen ARNP, CPNP
Nurse Practitioner, Neurosurgery
Children’s Hospital, Seattle

- Serial, consistent and well documented neuro assessment is vital
- Subtle changes may be first noted by someone close to child-caregiver, school nurse, etc

- Timely response to changes in neuro status of child is essential in preventing complications associated with neurological disorders

History

- Prenatal, perinatal, neonatal issues
- Medical and surgical history
- Family history
- Overall development/school performance
- Current medications
- Review of symptoms

History

- Current concerns – history of present illness
- During hx observe child
- Will “see” much of exam while observing the child

Development

- Does child meet developmental expectations?
- Knowledge of normal development is essential
- Normal milestones – (smile, sit, crawl, pull to stand, walk, words, words together), does the child meet the milestones appropriate for his age
Development

• If child delayed, do current concerns reflect loss of milestones, slowness in developmental progress or any developmental effect?
• Loss of milestones is always “red flag”

Examination of Child

• Initial appearance and observation
• Technique of successful exam is to observe and engage child in age-appropriate manner

ABCs

• Airway
• Activate
• Breathing
• Circulation
• AED

Vital Signs

• Neurological alterations can affect vital signs
• Changes in VS may be a late sign in increased ICP in children
• Sequential observation
• Cushing’s Tiral (widening pulse pressure, bradycardia and altered respiratory patterns) sx of increased ICP (not always in kids)

Mental Status

• Sequential assessment is most important
• Alert, aware of environment, oriented
• Interactive / communication
• Normal thought process / memory
• Follow directions (age appropriate)
• Affect
• Cognition (age appropriate)

Glass Coma Scale
Head

- If injured visually examine and palpate the head and neck for lacerations, swelling, bleeding, etc
- If neck injury suspected or if accident not observed should immobilize neck

Cranial Nerves

- Olfactory (sensory)—smell
- Optic (sensory)—visual acuity, pupil size and reactivity to light

Nerves

- Oculomotor
- Trochlear
- Abducens

Extraocular movements—EOMs

EOMs

- Have child follow light with eyes with head stationary thru 6 planes of movement, normal-EOMs intact
- Conjugate-eyes move together
- Dysconjugate-eyes do not move together
- Nystagmus-jerky motion of eyes, horizontal, vertical, rotary
Nerves

III Pupil response, raise eyelids, move eye
Palsy – dilation / pupil – NR
ptosis with eye down and out

IV Downward with inward movement of eye

VI Lateral movement
palsy – eye deviates medially

TABLE 7F-4. CHART OF PARALYSES OF INDIVIDUAL EYE MUSCLES

<table>
<thead>
<tr>
<th>Muscle</th>
<th>Nerve</th>
<th>Deviation of Eyeball</th>
<th>Diplopia Present When Looking^</th>
</tr>
</thead>
<tbody>
<tr>
<td>Internal rectus</td>
<td>III</td>
<td>Outward (external squint)</td>
<td>Toward nose</td>
</tr>
<tr>
<td>Superior rectus</td>
<td>III</td>
<td>Downward and inward</td>
<td>Upward and outward</td>
</tr>
<tr>
<td>Inferior rectus</td>
<td>III</td>
<td>Upward and inward</td>
<td>Downward and outward</td>
</tr>
<tr>
<td>Inferior oblique</td>
<td>III</td>
<td>Downward and outward</td>
<td>Upward and inward</td>
</tr>
<tr>
<td>Superior oblique</td>
<td>IV</td>
<td>Upward and outward</td>
<td>Downward and inward</td>
</tr>
<tr>
<td>External rectus</td>
<td>VI</td>
<td>Inward (internal squint)</td>
<td>Toward temple</td>
</tr>
</tbody>
</table>

Nerves

V Trigeminal (motor and sensory) – sensation of face, corneal reflex, muscle of mastication

VII Facial (motor and sensory) – facial motor, facial symmetry

VIII Acoustic (sensory) – hearing, equilibrium

OCULOMOTOR NERVE PARALYSIS
3rd Nerve Palsy

Sun Setting Eyes

Nadine Nielsen, ARNP, CPNP
Pediatric Nursing Update
February 29, 2008
Nerves

IX  Glossopharyngeal (motor and sensory)—gag, movement of palate
X  Vagus (motor and sensory)—swallow, voice, phonation
XI  Accessory (motor)—shoulder shrug
XII Hypoglossal (motor)—tongue midline, tongue movement

Cerebellar Exam

• Overall balance and coordination
• Observe gait, toe, heel and tandem walking (tandem walk >5yr)
  Ataxia may result from cerebellar lesion, drug intoxications, post seizure
• Finger, nose, finger exam—dysmetria
• Rapid alternating movement

Motor Exam

• Muscle size, shape and symmetry
• Tone
• Strength and symmetry of movement
• Quality of movement
• Observe spontaneous movement and response to verbal directions
• Hold arms up/eyes closed and look for drift (subtle weakness)

Muscle Strength

0  No movement
1  Flicker of movement
2  Movement with gravity eliminated (horizontal plane)
3  Movement against gravity but not resistance
4  Full movement that can be overcome by examiner
5  Normal strength

Sensory

• Response to light touch, pin prick
• If abnormal consider affected dermatome
• Proprioception—“where part is in space”
Infantile Reflexes

- Normal in infancy, may persist in delayed child
- Disappear first year of life
  - Moro – birth to 6 mos.
  - Babinski – birth to 2 yrs.
  - tonic neck – birth to 6 mos.
  - placing (stepping) – 6 mos.–1 yr.
  - rooting – birth to 6 mos.
  - sucking – birth to 12 mos.
  - Palmar – birth to 6 mos.

Deep Tendon Reflexes

- 0-4 quality (1/sluggish, 2/active, 3/hyperactive, 4/brisk, transient clonus)
  - Bicep
  - Triceps
  - Tadialis
  - Patellar
  - Achilles
  - Babinski
  - Clonus

Back and Spine

- Contour and symmetry
- Scoliosis (curve to left “red flag”)
- Dimples, lumps, tuft of hair

Skin

- Patches of hyper or hypopigmentation signs of neurological disorders
- Birth marks, port wine stain / face-scalp

Pain

- Pain may be related to a known diagnosis or new problem
- Assessment using 1-10 scale
  1 no pain-10 worst pain ever
  - Anxiety and pain may increase each another
  - Chronic pain may be related to nerve injury-neuropathic pain
  - Developmentally delayed child may be difficult to assess pain

Soft Signs

- Gross motor – clumsiness, awkwardness
- Problem with motor planning
- Fine motor – handwriting, handling small items
- Speech / language – expressive, receptive
- Behavior – interaction with others, toys, aggression, impulsiveness, distractiveness
Signs of Increased Intracranial Pressure

Infants
- ↑OFC
- Separation of sutures
- Bulge tense fontanelle
- Poor feeding
- Lethargy
- High pitched cry

Signs of ICP

Child
- Headache
- Nausea / vomiting
- Lethargy
- Diplopia, blurred vision
- Papilledema (not necessarily)
- Memory problems
- Decline cognitive function

Red Flags of Hx and Exam

- Headache – awaken from sleep or in a.m. or worsening over time
- Nausea / vomiting in a.m.
- Changes in gait / coordination
- Cranial nerve dysfunction
- Loss of cognitive function or milestones
- Scoliosis with curvature to the left

Questions