

**EXAMINATION OF THE CHILD WITH MINOR NEUROLOGICAL DYSFUNCTION**  
(Hadders-Algra 2010)

Name child: \_\_\_\_\_ Sex: \_\_\_\_\_  
 Birth-date: \_\_\_\_\_ Age: \_\_\_\_\_  
 Date examination: \_\_\_\_\_ Project: \_\_\_\_\_

General remarks: (note behavioral state and reactivity during examination!)

In case of asymmetry, enter score of worst side into computer scoring system.

**ASSESSMENT DURING SITTING**

Sitting:

0 = can without help of hands  
 1 = can, but needs help of hands  
 2 = cannot

**PT<sup>1</sup>** Posture during sitting:

**Head:**  
 0 = typical  
 1 = mildly abnormal, R / L / R & L:  
 2 = definitely abnormal, R / L / R & L:

**Trunk:**  
 0 = typical  
 1 = mildly abnormal, R / L / R & L:  
 2 = definitely abnormal, R / L / R & L:

**Arms:**  
 0 = typical  
 1 = mildly abnormal, R / L / R & L:  
 2 = definitely abnormal, R / L / R & L:

**Legs:**  
 0 = typical  
 1 = mildly abnormal, R / L / R & L:  
 2 = definitely abnormal, R / L / R & L:

Extended arms in pronation:

0 = typical  
 1 = mild unilateral deviation:  
 2 = mild bilateral deviation:  
 3 = marked unilateral deviation:  
 4 = marked bilateral deviation:

Extended arms in supination:

0 = typical  
 1 = mild unilateral pronation/flexion/deviation:  
 2 = mild bilateral pronation/flexion/deviation:  
 3 = marked unilateral pronation/flexion/deviation:  
 4 = marked bilateral pronation/flexion/deviation:

Involuntary movements:

|              |            |       |       |        |         |
|--------------|------------|-------|-------|--------|---------|
| <b>I-Ath</b> | athetiform | 0 = - | 1 = + | 2 = ++ | 3 = +++ |
| <b>I-Ch</b>  | choreiform | 0 = - | 1 = + | 2 = ++ | 3 = +++ |
| <b>I-Tr</b>  | tremor     | 0 = - | 1 = + | 2 = ++ | 3 = +++ |

**A** Mouth opening finger spreading phenomenon:

|                            |   | <b>L</b> |   |   |   | <b>R</b> |   |   |   |
|----------------------------|---|----------|---|---|---|----------|---|---|---|
| <i>Raw score:</i>          |   |          |   |   |   |          |   |   |   |
| During mouth opening:      | A | 0        | 1 | 2 | 3 | 0        | 1 | 2 | 3 |
| During closing eyes:       | B | 0        | 1 | 2 | 3 | 0        | 1 | 2 | 3 |
| While sticking out tongue: | C | 0        | 1 | 2 | 3 | 0        | 1 | 2 | 3 |

0 = no associated activity in rest of body  
 1 = age-adequate degree of associated activity  
 2 = excessive associated activity

**Co** Kicking:

0 = typical  
 1 = mildly abnormal R / L / R & L:  
 2 = definitely abnormal R / L / R & L:

<sup>1</sup> Abbreviations in first column refer to the cluster of dysfunction to which the signs noted at a specific test might attribute.  
 A = associated movements, Ath = Athetoid movements, Ch = choreiform movements, CN = cranial nerves, Co = coordination, F = fine manipulation, PT = posture & muscle tone, R = reflexes, S = sensory function.

**Co** Response to being pushed:

0 = typical

1 = mildly abnormal R / L / R &amp; L:

2 = definitely abnormal R / L / R &amp; L:

Voluntary relaxation:

0 = easy

1 = difficult

2 = refuses

Muscle power:

Head:

0 = typical

1 = mildly abnormal:

2 = definitely abnormal:

Trunk:

0 = typical

1 = mildly abnormal:

2 = definitely abnormal:

Arms:

0 = typical to relatively high

1 = mildly abnormal, R / L / R &amp; L:

2 = definitely abnormal, R / L / R &amp; L:

Legs

0 = typical to relatively high

1 = mildly abnormal, R / L / R &amp; L:

2 = definitely abnormal, R / L / R &amp; L:

**PT** Resistance to passive movements: ↓ = hypotonia, ↑ = hypertonia, ⇕ = variable muscle tone

Head:

0 = typical

1 = mildly abnormal:

2 = definitely abnormal: ↓ ↓ ↑ ↑ ⇕ ⇕

Trunk:

0 = typical

1 = mildly abnormal: ↓

2 = definitely abnormal: ↓ ↓ ↑ ↑ ⇕ ⇕

Arms:

0 = typical

1 = mildly abnormal,

2 = definitely abnormal, ↓ ↓ ↑ ↑ ⇕ ⇕ R / L / R &amp; L:

Legs:

0 = typical

1 = mildly abnormal,

2 = definitely abnormal, ↓ ↓ ↑ ↑ ⇕ ⇕ R / L / R &amp; L:

Range of movements: ↓ = movement restriction, ↑ = excessive range of movement

Head:

0 = typical

1 = mildly abnormal,

2 = definitely abnormal: ↓ ↓ ↑ ↑

Trunk:

0 = typical

1 = mildly abnormal:

2 = definitely abnormal, ↓ ↓ ↑ ↑

Arms:

0 = typical

1 = mildly abnormal,

2 = definitely abnormal, ↓ ↓ ↑ ↑ R / L / R &amp; L:

Legs:

0 = typical

1 = mildly abnormal,

2 = definitely abnormal, ↓ ↓ ↑ ↑ R / L / R &amp; L:

|          |                           |                           |                 |   |                |
|----------|---------------------------|---------------------------|-----------------|---|----------------|
| <b>R</b> | <u>Reflexes:</u>          |                           |                 |   |                |
|          | Arms: intensity threshold | 0 = typical               | 1 = abnormal, ↓ | ↑ | R / L / R & L: |
|          |                           | 0 = typical               | 1 = abnormal, ↑ | ↓ | R / L / R & L: |
|          | Legs: intensity threshold | 0 = typical               | 1 = abnormal, ↓ | ↑ | R / L / R & L: |
|          |                           | 0 = typical               | 1 = abnormal, ↑ | ↓ | R / L / R & L: |
| <b>R</b> | <u>Footsole response:</u> | 0 = typical:              | ↓ / -           |   |                |
|          |                           | 1 = abnormal:             | ↑               |   | R / L / R & L: |
| <b>R</b> | <u>Plantar grasp:</u>     | 0 = bilaterally absent    |                 |   |                |
|          |                           | 1 = unilaterally present, |                 |   | R / L          |
|          |                           | 2 = bilaterally present   |                 |   |                |

### ASSESSMENT DURING STANDING

|                  |                                  |
|------------------|----------------------------------|
| <u>Standing:</u> | 0 = can without help of hands    |
|                  | 1 = can, but needs help of hands |
|                  | 2 = cannot                       |

|           |                                 |                |  |                          |                |
|-----------|---------------------------------|----------------|--|--------------------------|----------------|
| <b>PT</b> | <u>Posture during standing:</u> |                |  |                          |                |
|           | Head:                           |                |  | Trunk:                   |                |
|           | 0 = typical                     |                |  | 0 = typical              |                |
|           | 1 = mildly abnormal,            | R / L / R & L: |  | 1 = mildly abnormal,     | R / L / R & L: |
|           | 2 = definitely abnormal,        | R / L / R & L: |  | 2 = definitely abnormal, | R / L / R & L: |
|           | Arms:                           |                |  | Legs:                    |                |
|           | 0 = typical                     |                |  | 0 = typical              |                |
|           | 1 = mildly abnormal,            | R / L / R & L: |  | 1 = mildly abnormal,     | R / L / R & L: |
|           | 2 = definitely abnormal,        | R / L / R & L: |  | 2 = definitely abnormal, | R / L / R & L: |

|          |                               |                           |  |  |       |
|----------|-------------------------------|---------------------------|--|--|-------|
| <b>R</b> | <u>Abdominal skin reflex:</u> | 0 = symmetrically present |  |  |       |
|          |                               | 1 = unilaterally absent,  |  |  | R / L |
|          |                               | 2 = bilaterally absent    |  |  |       |

|           |                 |   |  |  |                |
|-----------|-----------------|---|--|--|----------------|
| <b>Co</b> | <u>Romberg:</u> | 0 = typical performance, stands still / does only move ankles or toes |  |  |                |
|           |                 | 1 = mildly abnormal, shows body and arm movements                     |  |  |                |
|           |                 | 2 = definitely abnormal, loses balance, falls to                      |  |  | R / L / R & L: |

Test for involuntary movements: (0 = absent → 3 = continuously and clearly present)

|              |                               | L |   |   |   | R |   |   |   |
|--------------|-------------------------------|---|---|---|---|---|---|---|---|
| <b>I-Ch</b>  | distal choreiform movements   | 0 | 1 | 2 | 3 | 0 | 1 | 2 | 3 |
| <b>I-Ch</b>  | proximal choreiform movements | 0 | 1 | 2 | 3 | 0 | 1 | 2 | 3 |
| <b>I-Ath</b> | athetotiform movements        | 0 | 1 | 2 | 3 | 0 | 1 | 2 | 3 |
| <b>I-Tr</b>  | tremor                        | 0 | 1 | 2 | 3 | 0 | 1 | 2 | 3 |

|           |                                  |   |  |  |                |
|-----------|----------------------------------|---|--|--|----------------|
| <b>Co</b> | <u>Response to being pushed:</u> | 0 = typical performance, keeps balance          |  |  |                |
|           |                                  | 1 = mildly abnormal, steps too frequently aside |  |  | R / L / R & L: |
|           |                                  | 2 = definitely abnormal, loses balance          |  |  | R / L / R & L: |

|           |                         |   |  |  |                |
|-----------|-------------------------|---|--|--|----------------|
| <b>Co</b> | <u>Diadochokinesis:</u> |   |  |  |                |
|           | Performance:            | 0 = typical, age-adequate                           |  |  |                |
|           |                         | 1 = mildly abnormal,                                |  |  | R / L / R & L: |
|           |                         | 2 = definitely abnormal, serious dysdiadochokinesis |  |  | R / L / R & L: |

|          |                                  |  |  |  |                |
|----------|----------------------------------|--|--|--|----------------|
| <b>A</b> | associated movements: (diadocho) | 0 = absent                                   |  |  |                |
|          |                                  | 1 = present, age-adequate                    |  |  | R / L / R & L: |
|          |                                  | 2 = present, exceeding age-appropriate norms |  |  | R / L / R & L: |

|           |                          |                                       |  |  |                |
|-----------|--------------------------|---------------------------------------|--|--|----------------|
| <b>Co</b> | <u>Finger-nose test:</u> |                                       |  |  |                |
|           | with eyes open:          | 0 = typical, age-adequate performance |  |  |                |
|           |                          | 1 = mildly abnormal,                  |  |  | R / L / R & L: |
|           |                          | 2 = definitely abnormal:              |  |  | R / L / R & L: |

|  |  |                                  |
|--|--|----------------------------------|
| with eyes closed:  | 0 = typical, age-adequate performance<br>1 = mildly abnormal,<br>2 = definitely abnormal:                              | R / L / R & L:<br>R / L / R & L: |
| <b>Co</b> <u>Fingertip-touching test:</u><br>with eyes open: | 0 = typical, age-adequate performance<br>1 = mildly abnormal,<br>2 = definitely abnormal:                              | R / L / R & L:<br>R / L / R & L: |
| with eyes closed:  | 0 = typical, age-adequate performance<br>1 = mildly abnormal,<br>2 = definitely abnormal:                              | R / L / R & L:<br>R / L / R & L: |
| <b>F</b> <u>Finger opposition test:</u><br>smoothness:       | 0 = typical, age-adequate<br>1 = mildly abnormal,<br>2 = definitely abnormal, serious difficulties to perform          | R / L / R & L:<br>R / L / R & L: |
| <b>F</b> transition:   | 0 = typical, age-adequate<br>1 = mildly abnormal,<br>2 = definitely abnormal, serious difficulties to perform          | R / L / R & L:<br>R / L / R & L: |
| <b>A</b> associated movements:                               | 0 = absent<br>1 = present, age-adequate<br>2 = present, exceeding age-appropriate norms                                | R / L / R & L:<br>R / L / R & L: |
| <b>F</b> <u>Follow-a-finger test:</u>                        | 0 = typical, age-adequate<br>1 = mildly abnormal,<br>2 = definitely abnormal, serious difficulties to perform          | R / L / R & L:<br>R / L / R & L: |
| <b>F</b> <u>Circle test :</u><br>opposite direction          | 0 = typical, age-adequate<br>1 = mildly abnormal,<br>2 = definitely abnormal, serious difficulties to perform          | R / L / R & L:<br>R / L / R & L: |
| same direction   | 0 = typical, age-adequate<br>1 = mildly abnormal,<br>2 = definitely abnormal, serious difficulties to perform          | R / L / R & L:<br>R / L / R & L: |
| transition   | 0 = follows immediately changes of direction<br>1 = has problems in the transition from one movement form into another |                                  |

## ASSESSMENT OF WALKING

|  |   |                          |                |
|--|---|--------------------------|----------------|
| <u>Walking:</u>                          | 0 = can without help of hands<br>1 = can, but needs help of hands<br>2 = cannot |                          |                |
| <b>PT</b> <u>Posture during walking:</u> |   |                          |                |
| Head:                                    |   | Trunk:                   |                |
| 0 = typical                              |   | 0 = typical              |                |
| 1 = mildly abnormal,                     | R / L / R & L:  | 1 = mildly abnormal,     | R / L / R & L: |
| 2 = definitely abnormal,                 | R / L / R & L:  | 2 = definitely abnormal, | R / L / R & L: |
| Arms:                                    |   | Legs:                    |                |
| 0 = typical                              |   | 0 = typical              |                |
| 1 = mildly abnormal,                     | R / L / R & L:  | 1 = mildly abnormal,     | R / L / R & L: |
| 2 = definitely abnormal,                 | R / L / R & L:  | 2 = definitely abnormal, | R / L / R & L: |
| Feet:                                    |   |                          |                |
| 0 = typical                              |   |                          |                |
| 1 = mildly abnormal,                     | R / L / R & L:  |                          |                |
| 2 = definitely abnormal,                 | R / L / R & L:  |                          |                |
| <u>Gait</u>                              |   |                          |                |
| width:                                   |   | Quality of gait:         |                |
| 0 = typical                              |   | 0 = typical              |                |
| 1 = abnormal: narrow / broad             |   | 1 = abnormal:            |                |

Heel-toe gait:

- 0 = adequate heel-toe gait
- 1 = mildly abnormal: does not adequately roll from heel to toe or walks occasionally on tiptoe, R / L / R & L:
- 2 = walks consistently on tiptoe R / L / R & L:

**Co** Walking on a straight line:

- 0 = typical, age-adequate
- 1 = mildly abnormal,
- 2 = definitely abnormal, cannot perform or frequently loses balance

Walking on tiptoe:

- Performance
- 0 = typical, age-adequate
  - 1 = mildly abnormal, R / L / R & L:
  - 2 = definitely abnormal, cannot perform R / L / R & L:

**A** associated movements:

- 0 = absent
- 1 = present, age-adequate R / L / R & L:
- 2 = present, exceeding age-appropriate norms R / L / R & L:

Walking on heels:

- Performance:
- 0 = typical, age-adequate
  - 1 = mildly abnormal, R / L / R & L:
  - 2 = definitely abnormal, cannot perform R / L / R & L:

**A** associated movements:

- 0 = absent
- 1 = present, age-adequate R / L / R & L:
- 2 = present, exceeding age-appropriate norms R / L / R & L:

**Co** Standing on one leg:

|                                     | <b>L</b> | <b>R</b> |
|-------------------------------------|----------|----------|
| duration in seconds (test max 20 s) | .....    | .....    |
| toe flexion                         | - +      | - +      |
| swaying                             | - +      | - +      |

0 = typical, age-adequate  
 1 = mildly abnormal,  
 2 = definitely abnormal, serious difficulties to perform

**Co** Hopping:

|                              | <b>L</b> | <b>R</b> |
|------------------------------|----------|----------|
| number of hops (at least 20) | .....    | .....    |
| at same spot                 | - +      | - +      |
| on toes                      | - +      | - +      |

0 = typical, age-adequate  
 1 = mildly abnormal,  
 2 = definitely abnormal, serious difficulties to perform

**Co** Knee-heel test:

- accurate placing:
- 0 = typical, age-adequate
  - 1 = mildly abnormal, R / L / R & L:
  - 2 = definitely abnormal, serious difficulties to perform R / L / R & L:

sliding heel:

- 0 = typical, age-adequate
- 1 = mildly abnormal, R / L / R & L:
- 2 = definitely abnormal, serious difficulties to perform R / L / R & L:

**SENSORY SYSTEM**

- S** Graphaesthesia:  
 0 = adequate  
 1 = inadequate, R / L / R & L:
- S** Kinaesthesia:  
 0 = adequate  
 1 = inadequate, hands: R / L / R & L: feet: R / L / R & L:
- S** Sense of position:  
 0 = adequate  
 1 = inadequate, hands: R / L / R & L: feet: R / L / R & L:

**ASSESSMENT OF HEAD AND CRANIAL NERVES**

- CN** Facial motility:  
 0 = typical  
 1 = abnormal, R / L / R & L:
- S** Spectacles:  
 0 = no  
 1 = pos. glasses, about .....D  
 2 = neg. glasses, about .....D
- CN** Position of the eyes:  
 0 = typical  
 1 = heterophoria: R / L / R & L  
 2 = convergent strabismus: R / L / R & L  
 3 = otherwise abnormal
- CN** Fixation:  
 0 = typical  
 1 = abnormal:
- I-Ch** during fixation choreiform movements eyes - + ++  
 choreiform movements face - + ++
- CN** Pupillary reactions:  
 0 = typical and symmetrical  
 1 = abnormal, R / L / R & L:
- CN** Pursuit movements of the eyes:  
 0 = typical in all directions  
 1 = abnormal: movements in all directions, but jerky quality  
 2 = abnormal: imbalance of the eyes  
 3 = abnormal: movements limited in specific directions:
- I-Ch** during pursuit choreiform movements eyes - + ++  
 choreiform movements face - + ++
- CN** Nystagmus:  
 0 = bilaterally absent  
 1 = unilaterally present, R / L  
 2 = bilaterally present
- S** Visual fields:  
 0 = typical  
 1 = abnormal, R / L / R & L:
- S** Hearing: indications for deficits  
 0 = no  
 1 = yes. R / L / R & L:

Tongue:

**CN** motility  
0 = typical  
1 = abnormal:

**I-Ch** choreiform movements: - + ++

Speech:  
0 = typical  
1 = abnormal:

**CN** Pharyngeal arches:  
0 = symmetrically typical  
1 = asymmetrical:

**BODY-SCHEME**

Basic knowledge body parts  
0 = age-adequate  
1 = inadequate:

Knowledge of left-right  
0 = age-adequate  
1 = inadequate:

Crossing / Non crossing midline  
0 = age-adequate  
1 = inadequate:

**ANTHROPOMETRIC DATA**

Head circumference ..... cm

Weight: ..... kg

Length: ..... cm

**GENERAL**

Quantity of motility:  
0 = typical  
1 = abnormal: ↓ ↑

Quality of motility:  
0 = typical, fluent  
1 = abnormal, describe:

Hand-preference:  
0 = R  
1 = L  
2 = ambidexter

## SUMMARY

|              |                              |   |  |  |                     |   |
|--------------|------------------------------|---|--|--|---------------------|---|
| <b>PT</b>    | POSTURE                      | 0 = typical<br>1 = mildly abnormal:<br>2 = definitely abnormal:                         |  |  |                     |   |
| <b>PT</b>    | TONUS ARMS                   | 0 = normotonic<br>1 = hypotonic<br>2 = hypertonic                                       |  | 3= changing between hypo- and hypertonia<br>4 = asymmetry: |                     |   |
| <b>PT</b>    | TONUS LEGS                   | 0 = normotonic<br>1 = hypotonic<br>2 = hypertonic                                       |  | 3= changing between hypo- and hypertonia<br>4 = asymmetry: |                     |   |
| <b>R</b>     | REFLEXES ARMS                | intensity<br>threshold  | 0 = normal, medium<br>0 = normal, medium | 1 = low<br>1 = high  | 2 = high<br>2 = low | 3 = asym:<br>3 = asym:                    |
| <b>R</b>     | REFLEXES LEGS                | intensity<br>threshold  | 0 = normal, medium<br>0 = normal, medium | 1 = low<br>1 = high  | 2 = high<br>2 = low | 3 = asym:<br>3 = asym:                    |
| <b>R</b>     | OTHER REFLEXES               | footsole response<br>plantar grasp reaction<br>abdominal skin reflex                    | 0 = normal<br>0 = absent<br>0 = present  | 1 = Babinski sign:<br>1 = present:<br>1 = absent:          |                     | R / L / R&L<br>R / L / R&L<br>R / L / R&L |
| <b>I</b>     | INVOLUNTARY MOVEMENTS        |   |  |  |                     |   |
| <b>I-Ch</b>  | choreiform movements         | 0 = -   | 1 = +                                    | 2 = ++   | 3 = asym:           |   |
| <b>I-Ath</b> | athetotiform movements       | 0 = -   | 1 = +                                    | 2 = ++   | 3 = asym:           |   |
| <b>I-Tr</b>  | tremor                       | 0 = -   | 1 = +                                    | 2 = ++   | 3 = asym:           |   |
| <b>Co</b>    | COORDINATION PROBLEMS        | 0 = no problems<br>1 = some problems<br>2 = criteria for dysfunctional domain fulfilled |  |  |                     | R / L / R & L<br>R / L / R & L            |
| <b>F</b>     | FINE MANIPULATIVE DISABILITY | 0 = no problems<br>1 = some problems<br>2 = criteria for dysfunctional domain fulfilled |  |  |                     | R / L / R & L<br>R / L / R & L            |
| <b>A</b>     | ASSOCIATED MOVEMENTS         | 0 = absent<br>1 = present, age-adequate<br>2 = present, exceeding age-appropriate norms |  |  |                     | R / L / R & L<br>R / L / R & L            |
| <b>S</b>     | SENSORY DEFICITS             | 0 = no<br>1 = some problems<br>2 = criteria for dysfunctional domain fulfilled          |  |  |                     | R / L / R & L<br>R / L / R & L            |
| <b>CN</b>    | CRANIAL NERVE DYSFUNCTIONS   | 0 = no<br>1 = yes:  |  |  |                     |   |

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|                   |  |  |
|-------------------|--|--|
| <b>CONCLUSION</b> | <b>0 = NORMAL</b><br><b>1 = SIMPLE MND:</b><br><b>2 = COMPLEX MND:</b><br><b>3 = CP:</b> | <b>In case dysfunctional clusters, note which:</b> |
|-------------------|--|--|