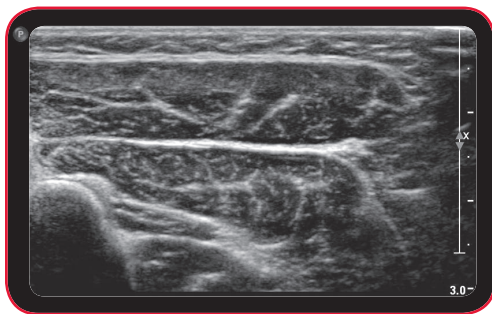


Sono's Anatomy

Focus on Spasticity
Targeting Botulinum Toxin
Children & Adults

Urban M. Fietzek | Steffen Berweck
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Questions & Answers
52 Targets for Injection
Instruments for
Therapy Evaluation
Comprehensive Literature

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Introduction

The ICF

This chapter contains selected classification and evaluation instruments that have become widely accepted standard procedures and can be recommended from our point of view. These evaluation instruments are grouped according to the ICF (International Classification of Functioning, Impairment and Health) of the WHO. The ICF can be used to describe a person's functional health. The classification provides a common terminology for all who take part in the rehabilitation process. Descriptions are based on a dynamic (bio-psycho-social) model that does not just offer a one-dimensional assessment of disease manifestation but a more comprehensive characterization of the patient taking his biological, psychological, social and other individually specific factors into account. Thus, the classification differenti-

ates between four dimensions (domains):

1. Body function,
2. body structure,
3. activity & participation, and
4. environmental factors.

When selecting a particular evaluation instrument the user should be clearly aware as to which level in relation to the ICF domain this instrument is able to evaluate: Does the selected instrument really depict the effect the user wants to measure? Is the chosen clinical examination procedure actually suitable for detecting the effect to be measured. For a detailed description of the ICF, the reader is referred to WHO website <http://www3.who.int/icf/icftemplate.cfm>.

Quality of Instruments

One of the decisive factors that determine the quality of these instruments is the quality of test criteria, the so called psychometric criteria. This was assessed

on the basis of the quoted literature. The grading of clinical value is based in addition to the literature data also on the authors' own clinical experience. The following grading is used:

Psychometric criteria

- +++ very good reliability and validity
- ++ good reliability and validity
- + limited reliability and validity
- psychometric studies not available

Clinical value

- +++ highly useful
- ++ very good
- + good

No single evaluation instrument can provide a complete picture of the complex issues involved in botulinum toxin treatment of children with cerebral palsy. Therefore, users should select a combination of different instruments for their own clinical work.

1. Instruments for classification - children

Instrument	What is Assessed?	ICF-Dimension
Gross Motor Function Classification System GMFCS	Classification of motor abilities, oriented to mobility, corresponding to age	Activity
Manual Ability Classification System MACS	Classification of manual abilities for children with CP, oriented to activities of daily living	Activity

Target Age	Psychometric criteria	Clinical value	Literature
1-12	+++	+++	Russell et al., 2003; Palisano et al., 1997; Palisano et al., 2000; Palisano et al., 2006
4-18	++	+++	www.macs.nu Eliasson et al., 2006

2. Instruments for evaluation – all patients

Instrument	What is Assessed?	ICF-Dimension
Goal Attainment Scaling GAS	Standardized therapy goal setting (in five levels) and determination, which level has been reached	According to individual therapy goal: function, activity, participation
Range of Motion ROM	Passive assessment of joint mobility with neutral-0-method (goniometry)	Body function / structure
Modified Tardieu Scale	„Fast“ assessment of joint mobility. Differentiates dynamic from contract muscle	Body function / structure
Modified Ashworth Scale	Evaluation of the degree of spasticity	Body function / structure
9-Hole-peg test (NHPT)	Standardized assessment of finger dexterity and manual skill	Activity

Target Age	Psychometric criteria	Clinical value	Literature
All ages	++	++	Maloney, 1993; Maloney et al., 1978; Cusick et al., 2006; Pali-sano, 1993
All ages	++	+	McDowell et al., 2000; Allington et al., 2002; Fosang et al., 2003
All ages	+ upper extremity ++ lower extremity	+++	Fosang et al., 2003; Scholtes et al., 2006; Boyd and Graham, 1999; Mackey et al., 2003
All ages	++ for knee flexors and elbow + for all other muscles	++	Fosang et al., 2003; Bohannon and Smith, 1987; Clopton et al., 2005; Scholtes et al., 2006
6-99	+++	+++	Oxford Grice et al., 2003; Croarkin et al., 2004; Goodkin et al., 1988; Smith et al., 2000

Instrument	What is Assessed?	ICF-Dimension
Video Documentation	Standardised documentation of baseline and follow-up examinations to evaluate therapy progress	Activity
Pain Scales Numeric Rating Scale (NRS) Visual Analog Scale (VAS)	Scales to assess amount of pain	Body function / pain
Timed Walking Test	Time to cover a defined distance	Body function Activity

Target Age	Psychometric criteria	Clinical value	Literature
All ages	++	Video documentation +++	Mackey et al., 2003; Maathuis et al., 2005
10-99	+++	+++	Tiplady et al., 1998; Downie et al., 1978
4-99	+++	+++	Rossier and Wade, 2001; van Loo et al., 2003; Green et al., 2002

3. Instruments for evaluation – children

Instrument	What is Assessed?	ICF-Dimension
Canadian Occupational Performance Measure COPM	Measures changes of self-evaluated function and performance during a period of time	Function Activity Participation
Gross Motor Function Measure GMFM 88	Evaluation of quantitative changes of motor functions within defined time period	Activity
Gross Motor Function Measure GMFM 66	Modified shortened version of GMFM 88 Not as well suited for severely affected children	Activity
Assisting Hand Assessment AHA	Evaluation of bimanual skills of children with hemiparesis	Activity
Quality of Upper Extremity Skills Test QUEST	Qualitative function of the upper extremity	Activity

Target Age	Psychometric criteria	Clinical value	Literature
From about 8 yrs on (need for self-evaluation)	+++	++	www.caot.ca/copm Cusick et al., 2006; Carswell et al., 2004
0.5 – 16	+++	+++	Russell et al., 2000
0.5 – 16	++	+++	Russell et al., 2003
1.5 – 5 (extension to children up to 15 and adults under way; pers. comm.)	+++	+++	Sundholm and Eliasson, 2003
1.5 – 8	+++	++	www.can-child.ca De Matteo et al., 1993

Instrument	What is Assessed?	ICF-Dimension
Activity Scale for Kids ASK	Standardized Questionnaire for children to assess function and participation in everyday activities	Activity Participation
Pediatric Evaluation of Disability Inventory PEDI	Standardized questionnaire for parents to assess the amount of functional deficits of everyday activities	Activity Participation
Care and Comfort Hypertonicity Questionnaire CCHQ	Standardized questionnaire for parents to evaluate the amount of muscle tone and its effects on care, transfer, pain, interaction and communication	Activity Participation
(Health related) Quality of Life Assessments QoL / HRQL	Various questionnaires to determine quality of life	Participation

Target Age	Psychometric criteria	Clinical value	Literature
5-15	+++	++	Young et al., 2000; Morris et al., 2005
0.5 – 7.5	+++	+++	www.bu.edu/hdr/products/pedi
3-21	+++	+++	Nemer McCoy et al., 2006
0-12	-to +++	+++	Davis et al., 2006; De Civita et al., 2005

4. Instruments for evaluation – adult patients

Instrument	What is Assessed?	ICF-Dimension
Action Research Arm Test ARAT	Assessment of arm function using standardized test material	Function Activity
Fugl-Meyer-Arm-Score	226-point multi-point Likert-type scale developed as an evaluative measure of recovery from hemiplegic stroke	Function Activity
Wolf Motor Function Test (WMFT)	Evaluates the ability to use the upper extremity in simple and complex/functional tasks	Function Activity
Functional ambulation categories FAC	Assess mobility according to the assistance needed during walking	Function Activity
Get/Timed Up and Go TUG	Easy to perform measure to assess mobility	Function Activity
Rivermead Mobility Index (RMI)	Questionnaire to assess mobility during various activities and transfer	Activity

Psychometric criteria	Clinical value	Literature
+++	++	Heller et al., 1987; van der Lee et al., 2001; Van der Lee et al., 2001
+++	+	Fugl-Meyer et al., 1975; Sanford et al., 1993; Roden-Jullig et al., 1994; Gladstone et al., 2002
+++	+++	Wolf et al., 1989; Wolf et al., 2001; Morris et al., 2001
-	++	Holden et al., 1986; Collen et al., 1990
+++	+++	Mathias et al., 1986; Podosiadlo and Richardson, 1991; Lin et al., 2004
+++	++	Collen et al., 1991; Hsieh et al., 2000; Antonucci et al., 2002

Instrument	What is Assessed?	ICF-Dimension
Barthel ADL Index	Widely used instrument to assess independency of activities of daily living	Activity
Stroke Specific Quality of Life Scale SS-QOL	Patient-centered outcome measure intended to provide an assessment of health-related quality of life specific to patients with stroke	Activity Participation
EuroQoL EQ-5D	Standardised instrument for use as a measure of health outcome.	Activity Participation
36-Item Short-Form Health survey SF-36	Self-evaluative instrument of health-related quality of life (psychological, physical and social components)	Activity Participation

Psychometric criteria	Clinical value	Literature
+++	+++	Collin et al., 1988; Loewen and Anderson, 1990; Mahoney and Barthel, 1965; van der Putten et al., 1999
+++	+++	Williams et al., 1999
+++	++	www.euroqol.org
+++	++	Anderson et al., 1996; Ruta et al., 1998

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