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Module 3:
Screening and assessment of the Development of Infants and Children (0-3 Years)

Disclaimer

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Module 3. Screening and assessment of the Development of Infants and Children (0-3 Years)

Description of Module:

This module will provide a short overview of:

- Basic principles of child and family assessment
- Functional assessment tools for infants and children
- Instruments to assess the priorities and resources of the family

Screening and assessment of the development of infants and children (0-3 years)

Main Objectives of Module:

1. To understand and discuss principles of **recommended practices** for assessment in EI.

2. To include the **family as an active participant** in the assessment process of the child and the family.

3. To select, apply and interpret **instruments to assess the child´s** development and functionality, as well as **concerns, priorities and resources of the family.**

Assessment recommended practices in Early Intervention

For professionals the following practices are recommended:

A1. **work with the family** to identify family preferences for assessment processes.

A2. **work as a team** with the family and other professionals to gather assessment information.

A3. **use assessment materials and strategies that are appropriate for the child's age and level of development** and accommodate the child's sensory, physical, communication, cultural, linguistic, social, and emotional characteristics.

A4. conduct **assessments that include all areas of development** and behavior to learn about the child's strengths, needs, preferences, and interests.

Division for Early Childhood. (2014). *DEC recommended practices in early intervention/early childhood special education 2014*. Retrieved from http://www.dec-sped.org/recommendedpractices.

Assessment recommended practices in Early Intervention

For professionals the following practices are recommended (continued):

A5. conduct assessments in the **child's dominant language and in additional languages** if the child is learning more than one language.

A6. use a **variety of methods, including observation and interviews**, to gather assessment information from multiple sources, including the child's family and other significant individuals in the child's life.

A7. obtain information about the **child's skills in daily activities, routines**, and environments such as home, center, and community.

Division for Early Childhood. (2014). *DEC recommended practices in early intervention/early childhood special education 2014*. Retrieved from http://www.dec-sped.org/recommendedpractices.

Assessment recommended practices in Early Intervention

For professionals the following practices are recommended (continued):

A8. use **clinical reasoning** in addition to assessment results, to identify the child's current levels of functioning and to determine the child's eligibility and plan for instruction.

A9. implement **systematic ongoing assessment** to identify learning targets, plan activities, and monitor the child's progress to revise instruction as needed.

A10. use assessment tools with sufficient **sensitivity to detect child progress** - especially for the child with significant support needs.

A11. report assessment results so that they are **understandable and useful** to families.

Division for Early Childhood. (2014). *DEC recommended practices in early intervention/early childhood special education 2014*. Retrieved from http://www.dec-sped.org/recommendedpractices.

Principles for an appropriate assessment

- **Integrated development model** – A holistic and ecological vision of the child and his family.
- **Multiple sources of information and multiple components** - taking into account the complexity of the development, the contexts and the instruments.
- **Relationship and interactions with care provider** - based on the context of the relationships and interactions of the child and family.

Geenspan, S. I.; Meisels, S. J. (1996). Toward a new vision for the developmental assessment of infants and young children. In: Meisels, S. J.; Fenichel, E. (Ed.). *New visions for the developmental assessment of infants and young children* (pp. 11-26).Washington, DC: Zero to Three

Principles for an appropriate assessment

- **“Normative" Development is the reference for the interpretation of results** - reference to the typical development for the interpretation of the differences.
- **Is a process of collaboration** - collaborative relationship between family and professionals.
- **First step to the intervention process** – Foundation of the entire process of intervention and support

Geenspan, S. I.; Meisels, S. J. (1996). Toward a new vision for the developmental assessment of infants and young children. In: Meisels, S. J.; Fenichel, E. (Ed.). *New visions for the developmental assessment of infants and young children* (pp. 11-26).Washington, DC: Zero to Three

Assessment Standards in Early Intervention

- **UTILITY**
- **ACCEPTABILITY**
- **AUTHENTICITY**
- **COLLABORATION**
- **CONVERGENCE**
- **EQUITY**
- **SENSITIVITY**
- **CONGRUENCE**

Bagnato, S. J. (2007). *Authentic assessment for early childhood intervention best practices: The Guilford school practitioner*. New York: Guilford

Assessment Standards in Early Intervention

- **UTILITY**

The assessment should be useful to fulfill the multiple purposes of Early Intervention, namely: detection, eligibility, intervention planning, monitoring, and evaluation of the impact of program quality.

- **ACCEPTABILITY**

The instruments, styles, materials and methodologies adopted, must be mutually accepted by professionals and families.

- **AUTHENTICITY**

The assessment should take place in the natural contexts of child and family´s life, in order to obtain authentic information about the child's skills, concerns and priorities of family.

Bagnato, S. J. (2007). *Authentic assessment for early childhood intervention best practices: The Guilford school practitioner*. New York: Guilford

Assessment Standards in Early Intervention

- **COLLABORATION**

  Between families and professionals, thus enhancing teamwork. Parents and other family members should be active partners in the assessment process.

- **CONVERGENCE**

  The convergence of different perspectives (parents, early childhoods educators, physiotherapists, and other professionals) provides a better and more adequate background information.

Bagnato, S. J. (2007). *Authentic assessment for early childhood intervention best practices: The Guilford school practitioner*. New York: Guilford

Assessment Standards in Early Intervention

- **EQUITY**

  The assessment should respond to individual differences by considering sensory, affective and cultural characteristics as well as family values and beliefs.

- **SENSITIVITY**

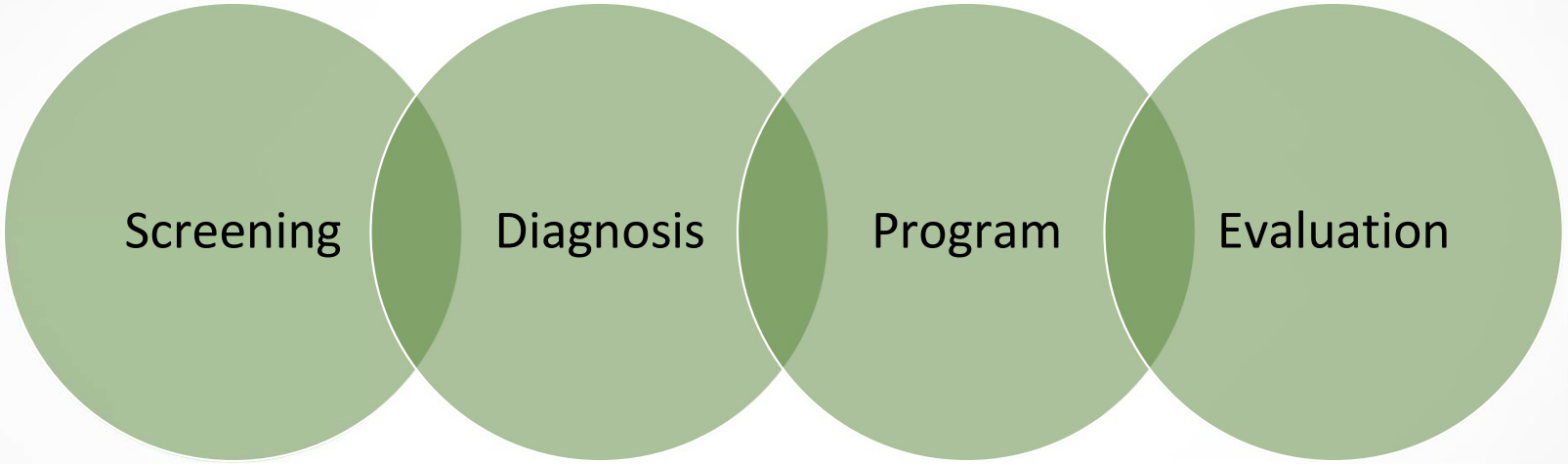
  Assessment tools and materials should be sensitive to detect the child's changes and development as well as concerns and priorities of the family.

- **CONGRUENCE**

  The assessment tools should be congruent with the age group in which the child is, as well as with his / her working styles and interests.

Bagnato, S. J. (2007). *Authentic assessment for early childhood intervention best practices: The Guilford school practitioner*. New York: Guilford

Purposes of Assessment



Stevenson, W., Grishan-Brown, J.& Pretti-Frontczak, K. (2011). Authentic assessment. In J. Grishan-Brown & K. Pretti-Frontczak, *Assessing young children in inclusive settings: The blended practices approach*. Baltimore: Paul H. Brookes

Screening and Assessment Instruments

Screening and Assessment occur in separate moments:

Screening

The screening process is used:

- To determine if developmental skills are progressing as expected, or if there is cause for concern and further evaluation is necessary;
- To whether the need for further assessment in one or more areas of development;
- To identify children that are at risk for health problems, developmental problems, and/or disabling conditions, and who may need to receive helpful intervention services as early as possible.

Screening: two assumptions

First - Early intervention can help reduce developmental delays and prevent the adverse developmental effects of risk factors (biological and/or environmental);

Second - Early intervention is more effective when begun early in the life of child

Guralnick, M. J. (Ed.). (2005). *The developmental systems approach to early intervention*. Baltimore: Brookes

Sample Screening Instruments

Examples:

- **Ages and Stages Questionnaires** (ASQ), Brookes Publishing Company (available in different languages. Please consult the ASQ official website agesandstages.com for more information)
- **Schedule Growing Skills** (SGS 2) (Bellman, Lingam, & Aukett, 1996)
- **Battelle Developmental Inventory Screening Test**, Riverside Publishing
- **Developmental Indicators for Assessment of Learning** (DIAL) III, Pearson Assessments (includes Spanish materials)

Diagnostic Assessment

The diagnostic process is used:

- To determine whether a problem exists;
- To identify the nature of the problem;
- To determine eligibility for specialized services;
- To identify strengths and areas of need to support development, instruction, and/or behavior;
- To determine the severity and nature of special needs, and establish program eligibility;
- To identify and secure appropriate intervention services for children whose development and learning are delayed.

Program Assessment

The Program Assessment is used:

- To determine a child's current skill level or baseline skills before intervention
- To develop Individualized Family Support Program (IFSP) or Individualized Educative Program (IEP) goals and objectives
- To plan curriculum
- To monitor progress
- To refine/revise/adapt instruction

Program Evaluation

To evaluate programs and provide accountability data on program outcomes for the purpose of program improvement.

- To determine the effectiveness of a program;
- To provide accountability for meeting desired results (e.g., standards, outcomes).

Traditional Assessment

- **Child-centered**
  - Based on the deficits
- **Formal instruments**
  - Structured tasks, normative outcome
  - Clinical services
  - Various professionals, artificial situations
- **Non family participation**
  - Overvaluation of professional skills

Authentic Assessment

- "Systematic record of developmental observation over time by families and knowledgeable caregivers about the naturally occurring competencies of young children in daily routines" (Bagnato, 2007, p. vii).

- "Practice of assessment children in their natural environment (eg. Home, school, childcare center) on functional skills that are needed in that environment with materials that are part of the environment, by people with whom the children are familiar" (Stevenson, Grisham-Brown & Pretti-Frontczak, 2011, p.17).

Bagnato, S. J. (2007). *Authentic assessment for early childhood intervention best practices: The Guilford school practitioner*. New York: Guilford

Stevenson, W., Grishan-Brown, J.& Pretti-Frontczak, K. (2011). Authentic assessment. In J. Grishan-Brown & K. Pretti-Frontczak, *Assessing young children in inclusive settings: The blended practices approach*. Baltimore: Paul H. Brookes

Best practices in the authentic assessment

Family Centered - Families must be active members of the Assessment process, being able to choose and decide the different roles they want to adopt (observer, enabler, …).

Individualized and functional Assessment should focus on the child's needs, characteristics and working styles, as well as on the functional competencies needed in his or her life contexts.

Ecological Assessment should occur in the natural contexts (homes, day care center, kindergarten, parks,) of the child and his / her family, with materials that are part of these contexts and with people who are familiar and meaningful to them.

Transdisciplinary team allows different perspectives and different knowledge's (professionals and family) that provide a more authentic vision of the development, learning and needs of the child and its families.

Steps of the child assessment process

1. **Assessment Planning –** Preassessment Planning

1. **Conducting Assessment**

1. **Sharing Results**

Steps of the child assessment process

1. Assessment Planning

<u>In this step are defined</u>:

- The objectives of the evaluation according to the different actors;
- The identification of family concerns for the evaluation;
- The identification of the family's choices regarding the conduct of the evaluation (time, day, place, people involved etc.);
- The identification of the areas, activities and strategies of greater achievement of the child;
- The roles that the family can adopt during the evaluation.

Steps of the child assessment process

1. Assessment Planning

Preassessment planning – Parents may be encouraged to think about what issues they want address; to talk about their concerns; notice the kinds of activities or actions that may improve their child's performance (Crais, 1996).

Project Dakota Checklist for preassessment planning

1. What questions or concerns do others have (babysitter, preschool,…?
2. Are there other places where we should observe your child?
3. How does your child do around other children?
4. Where would you like the assessment to take place?
5. What time of the day?
6. Are there others who should be there in addition to parents and staff?
7. What are your child's favorite toys or activities that help him become focused, motivated, and comfortable?
8. Which roles would you find comfortable during assessment (sit beside your child; help with activities; offer comfort and support; exchange ideas; carry out activities to explore your child's abilities; … other)?

Crais, E. (1996). Applying family-centered principles to child assessment.In E. Crais, P. McWilliam, P. Winton (Eds). *Practical strategies for family-centered early intervention* (pp. 69-96). Baltimore: CA: Singular Publishing

Steps of the child assessment process

2. Conducting Assessment

In this step are defined:

- The formal and / or informal tools to be used, taking into account the family's concerns, resources and system needs (standardized tests, interviews, observation in context, record of behaviors, etc.);
- The process of sharing information and impressions on the child's performance or competences.
- The objectives and strategies of intervention, always bearing in mind the concerns and priorities of the family.

Identification of family concerns, priorities, and resources

2. Conducting Assessment

We are not assessing families, we are developing an understanding of what families hope to accomplish and what, if anything, they need from us (Winton, 1996, p.33)

The goal is to develop an ongoing understanding of where families want, what resources and strategies are available to the family to accomplish what they identify as being important.

In this step we must make sure that: Intervention efforts are guided by family priorities and that interventions build on family resources

Winton, P. (1996). Understanding family concerns, priorities, and resources. In E. Crais, P. McWilliam, P. Winton (Eds). *Practical strategies for family-centered early intervention* (pp. 31-53). Baltimore: CA: Singular Publishing

Identification of family concerns, priorities, and resources

HOW?

- Listening to family "stories"
- Ask questions to clarify the information
- Observe family environment, functioning, routines and interactions
- Using surveys and scales as professional aids in gathering information

Identification of family concerns, priorities, and resources

Sample Surveys, Scales and interview for identifying family concerns, priorities, and resources

- ✓ Family Needs Scale (Dunst, Cooper, Weeldreyer, Snyder, & Chase, 1988)
- ✓ Family Functioning Style Scale (Deal, Trivette & Dunst, 1988)
- ✓ Support Functions Scale (Dunst & Trivette, 1988)
- ✓ Family Resource Scale (Dunst & Leet, 1987)
- ✓ Family Support Scale (Dunst, Trivette, & Jenkins, 1988)
- ✓ Inventory of Social Support (Trivette & Dunst, 1988)
- ✓ The Ecomap (Hartmann, 1995)
- ✓ Routines Based Interview (McWilliam, 1992)

McWilliam, R. A. (1992). *Family-centered intervention planning: A routines-based approach*. Tucson, AZ: Communication Skill Builders

Steps of the child assessment process

3. Sharing Results

This step of the assessment process should be useful, reinforcing and promoting skills and hope in the family.

In this step we make sure that:

- The different perspectives (family, professionals, …) should be discussed,
- The results obtained should be presented and discussed;
- The objectives and type of the intervention should be defined
- Copies / originals of all documents must be delivered to the family.

Awareness of the importance of collaboration with families in assessment

- Relationships based upon trust and mutual respect
- Recognition that primary caregivers are experts about their children
- Appreciation of a family’s role in children's development
- Respect of individual preferences for levels and degrees of involvement

Screening and assessment of the Development of Infants and Children (0-3 Years)

- There are no magic instruments or miraculous questionnaires that can replace the authentic understanding born of deep knowledge, mutual trust and communication.

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Screening and Assessment Instruments

Early Intervention

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Screening Instruments

Early Intervention

Ages and Stages Questionnaires (ASQ)

There are 2 different types of ASQ questionnaires:

The Ages and Stages Questionnaires (ASQ)

The Ages and Stages Questionnaires: Social-Emotional (ASQ:SE)

Ages and Stages Questionnaires (ASQ)

Title, Edition, Dates of Publication and Revision	• **First edition Ages & Stages Questionnaires (ASQ)**: *A Parent-Completed, Child-Monitoring* System, 1995 • **Second edition of ASQ**, 1999 • **Third edition of ASQ (ASQ-3)**, 2009
Authors:	Jane Squires and Diane Bricker (University of Oregon)
Costs:	**$295** for ASQ-3 Starter Kit (includes 21 photocopiable print masters of the questionnaires and scoring sheets, a CD-ROM with printable PDF questionnaires, the ASQ-3 User's Guide, and a ASQ-3 Quick Start Guide) through Brookes Publishing.
Age Range:	Children from 2-66 months.
Type of test:	The ASQ-3 is a parent reported initial level developmental screening instrument.
Domains	Five areas: (i) personal social, (ii) gross motor, (iii) fine motor, (iv) problem solving, and (v) communication

Singha, A., Yehb, C. J., & Blanchard, S. B. (2017). Ages and Stages Questionnaire: a global screening scale. *Boletín Médico del Hospital Infantil de México, 74(1),* 5-12.

Squires, J. & Bricker, D. (2009). *Ages & Stages Questionnaires, Third Edition (ASQ-3). A parent-completed child-monitoring system.* Baltimore: Paul H. Brookes Publishing Co.

Ages and Stages Questionnaires (ASQ)

History:	• **1970s** – first developments of the instrument • **1979** – landmark study (Knobloch, 1979) reveals the opportunities that parent-completed reports could bring: lower costs and higher accuracy • **1980s–1990s** –new breed of questionnaires is created, each specifically crafted for a different stage of development that asked parents simple questions about their child's observable behaviors. • **1995** – The ASQ first edition is published. The tool had 8 questionnaire intervals ending at 48 months. • **1997–1998** – continued development of screener ASQ as the following intervals were developed: 10, 14, 22, 27, 33, 42, 54, and 60 months. • **1999** – Revised and expanded Second Edition of ASQ is published. • **2004** - Data collection begins on the 3rd edition, ASQ-3. Over 4 years, approximately 18,000 ASQ-3 questionnaires are collected on children from all 50 states and several U.S. territories. • **2009** – ASQ Third Edition (ASQ-3) is published. Among the many changes, this edition features new 2 and 9 month questionnaires.

Singha, A., Yehb, C. J., & Blanchard, S. B. (2017). Ages and Stages Questionnaire: a global screening scale. *Boletín Médico del Hospital Infantil de México, 74(1),* 5-12.

Squires, J. & Bricker, D. (2009). *Ages & Stages Questionnaires, Third Edition (ASQ-3). A parent-completed child-monitoring system.* Baltimore: Paul H. Brookes Publishing Co.

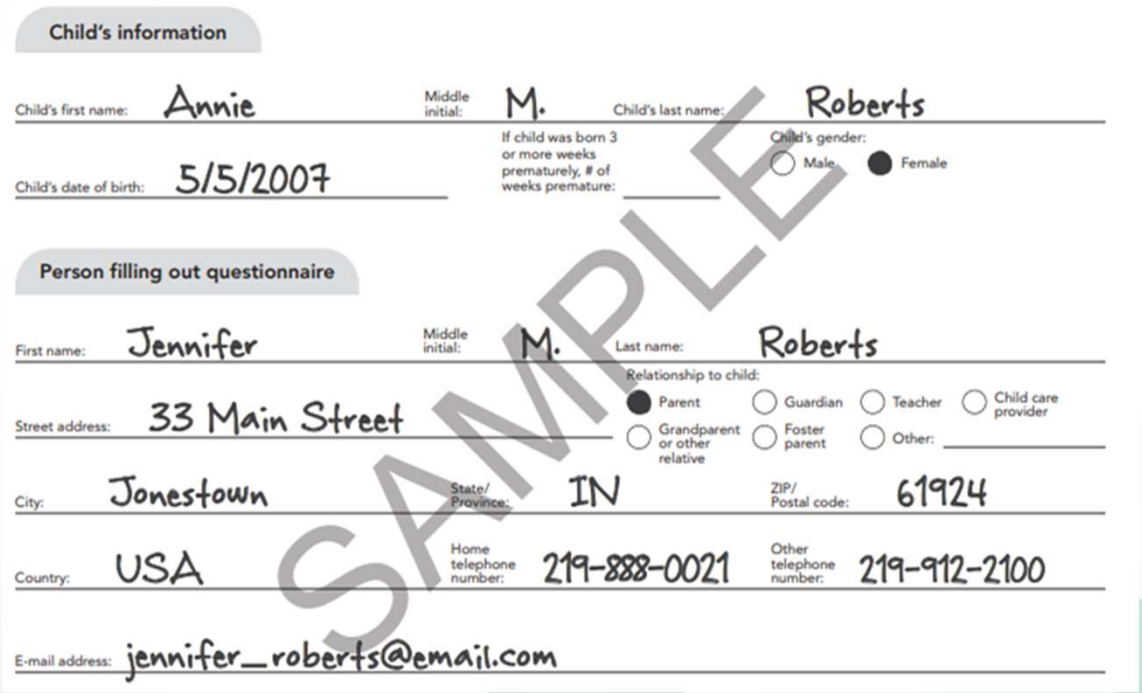
Ages and Stages Questionnaires (ASQ)

Purpose:	**a) Target Group:** All children from 2 to 66 months of age. **b) Specifications:** • The ASQ-3 is a parent reported initial level developmental screening instrument consisting of 21 intervals, each with 30 items in five areas: (i) personal social, (ii) gross motor, (iii) fine motor, (iv) problem solving, and (v) communication for children from 2-66 months. It can be completed by parents in 12-18 minutes. • The ASQ-3 accurately identifies young children who are in need of further evaluation to determine if they are eligible for early intervention services. • The ASQ has been translated into several languages, (some examples of the available translations: Spanish, French, Dutch, Chinese, Norwegian, Hindi, Persian, Turkish, etc.) • International studies yielded standardized parent-completed scores that were effective and comparative across languages and cultures. • It has excellent psychometric properties, test-retest reliability of 92%, sensitivity of 87.4% and specificity of 95.7%. Validity has been examined across different cultures and communities across the world. • The ASQ has shown to be reliable and cost-effective as well as correlate well with pediatricians' and service providers' assessment

Squires, J. & Bricker, D. (2009). *Ages & Stages Questionnaires, Third Edition (ASQ-3). A parent-completed child-monitoring system.* Baltimore: Paul H. Brookes Publishing Co.

Ages and Stages Questionnaires (ASQ)

Scoring and Statistical Information	Each age questionnaire is composed by the following sections: I. Child's information (name, gender, age) II. Person filling out questionnaire information (name, address, relationship to the child, contact) III. Program information (child ID number, program ID number, program name)



Child's information

Child's first name: Annie Middle initial: M. Child's last name: Roberts

Child's date of birth: 5/5/2007

If child was born 3 or more weeks prematurely, # of weeks premature: _____

Child's gender: ○ Male ● Female

Person filling out questionnaire

First name: Jennifer Middle initial: M. Last name: Roberts

Relationship to child: ● Parent ○ Guardian ○ Teacher ○ Child care provider ○ Grandparent or other relative ○ Foster parent ○ Other: _____

Street address: 33 Main Street

City: Jonestown State/ Province: IN ZIP/ Postal code: 61924

Country: USA Home telephone number: 219-888-0021 Other telephone number: 219-912-2100

E-mail address: jennifer_roberts@email.com

SAMPLE

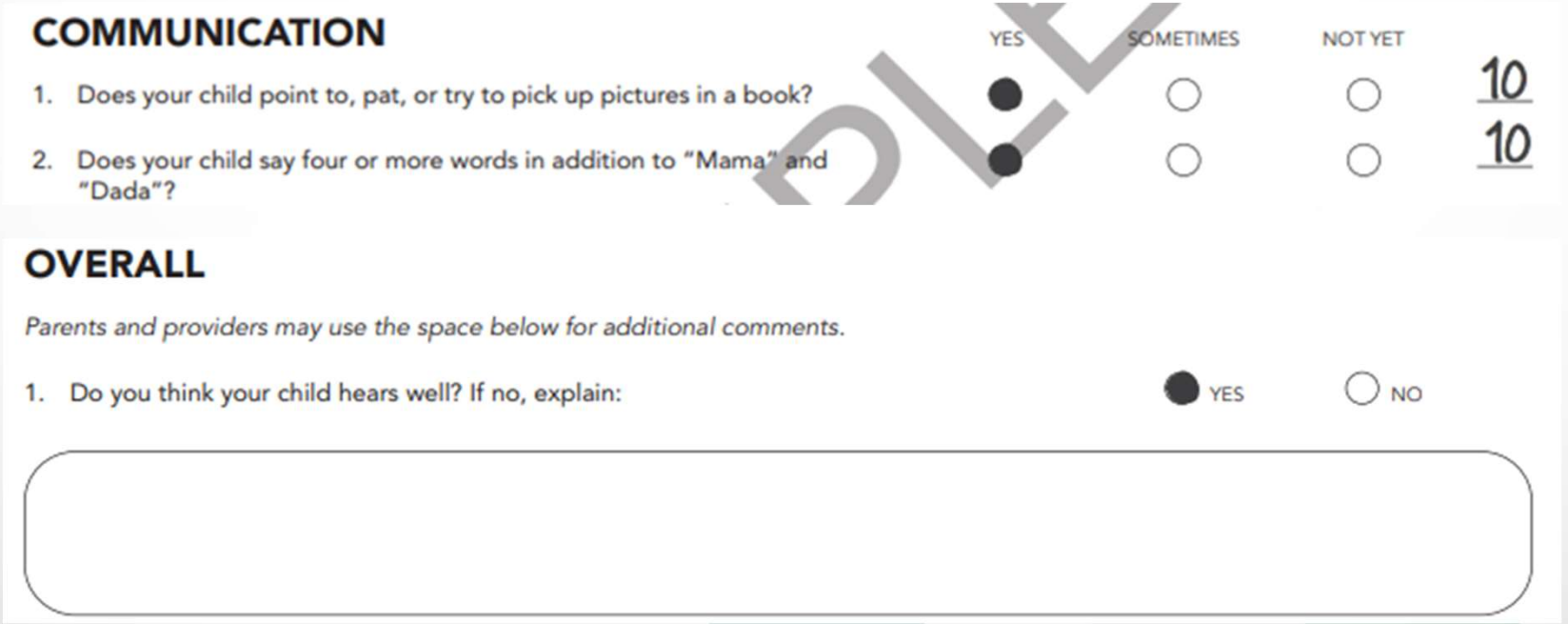
Squires, J. & Bricker, D. (2009). *Ages & Stages Questionnaires, Third Edition (ASQ-3). A parent-completed child-monitoring system.* Baltimore: Paul H. Brookes Publishing Co.

Ages and Stages Questionnaires (ASQ)

IV. Questions in five categories: (i) personal social, (ii) gross motor, (iii) fine motor, (iv) problem solving, and (v) communication
   - ➢ Each question can be answer as "YES", "SOMETIMES" or "NOT YET " based on what the child is able to do at the moment.

V. Overall questions (YES/NO) with space for additional comments
   - ➢ Depending on the responses on the overall question, additional follow-up may be required.

To answer each question, parents can try fun and simple activities with the child in order to encourage the child to play, move around, and practice day-to-day skills.



COMMUNICATION

	YES	SOMETIMES	NOT YET	
1. Does your child point to, pat, or try to pick up pictures in a book?	●	○	○	10
2. Does your child say four or more words in addition to "Mama" and "Dada"?	●	○	○	10

OVERALL

Parents and providers may use the space below for additional comments.

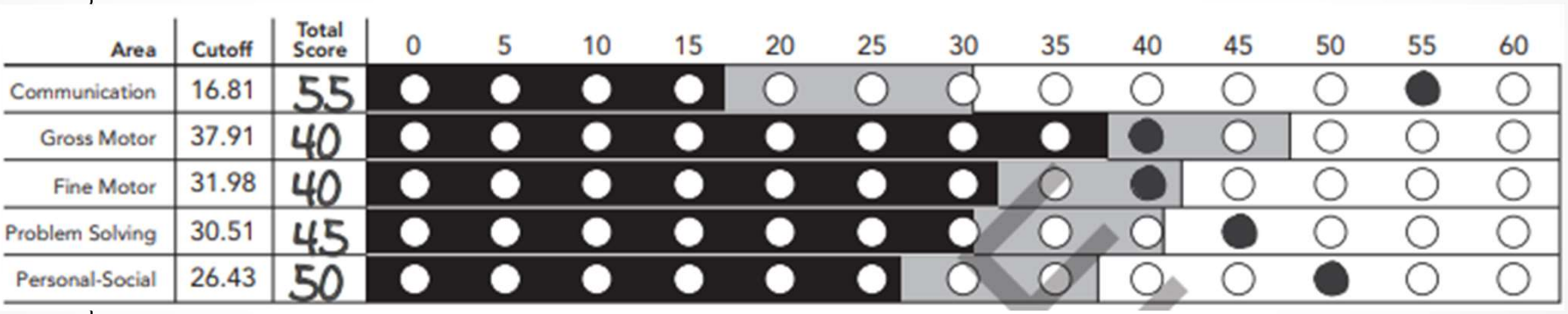
1. Do you think your child hears well? If no, explain: ● YES ○ NO

Squires, J. & Bricker, D. (2009). *Ages & Stages Questionnaires, Third Edition (ASQ-3). A parent-completed child-monitoring system.* Baltimore: Paul H. Brookes Publishing Co.

Ages and Stages Questionnaires (ASQ)

Scoring and Statistical Information

- Each item is scored:
  - ❑ YES = 10
  - ❑ SOMETIMES = 5
  - ❑ NOT YET = 0
- The item scores are added and the total is recorded in the corresponding area. Example:



If the child's total score is in the ▭ area, it is above the cutoff, and the child's development appears to be on schedule.
If the child's total score is in the ▭ area, it is close to the cutoff. Provide learning activities and monitor.
If the child's total score is in the ■ area, it is below the cutoff. Further assessment with a professional may be needed.

Source: Squires & Bricker, 2009

- After the completion of the questionnaire, a professional shares the results with the parents.
- Follow-up actions (if needed) are identified in the results sheet

Squires, J. & Bricker, D. (2009). *Ages & Stages Questionnaires, Third Edition (ASQ-3). A parent-completed child-monitoring system.* Baltimore: Paul H. Brookes Publishing Co.

Ages and Stages Questionnaires: Social-Emotional (ASQ:SE)

Title, Edition, Dates of Publication and Revision	• **First edition Ages & Stages Questionnaires: Social-Emotional (ASQ:SE)**: *A Parent-Completed, Child-Monitoring System for Social-Emotional Behaviors*, 2001 • **Second Edition of ASQ:SE (ASQ:SE-2)**, 2015
Authors:	Jane Squires, Diane Bricker & Elizabeth Twombly
Costs:	**$295** for ASQ:SE-2 Starter Kit (includes 9 paper masters of the questionnaires and scoring sheets, a CD-ROM with printable PDF questionnaires, the essential ASQ:SE-2 User's Guide, and free laminated ASQ:SE-2 Quick Start Guide) through Brookes Publishing.
Age Range:	Children from 1-72 months.
Type of test:	Screening of children at risk for social or emotional difficulties.
Domains	Seven behavioral areas: (i) self-regulation; (ii) compliance; (iii) communication; (iv) adaptative functioning; (v) autonomy; (vi) affect; (vii) interaction with people.

Squires, J., Bricker, D., & Twombly, E. (2015). *Ages & Stages Questionnaires: Social-Emotional, Second Edition (ASQ:SE-2)*. Baltimore: Paul H. Brookes Publishing Co.

Ages and Stages Questionnaires: Social-Emotional (ASQ:SE)

History:	• **1996** – validity, reliability, and utility studies on a field-test version ASQ:SE are initiated. • **2001** – First edition of Ages & Stages Questionnaires: Social-Emotional (ASQ:SE) is published • **2009** – Work on the 2nd edition of ASQ:SE begins. Over a 2-year period, 16,424 questionnaires were completed by parents and caregivers across the United States and Canada. • **2015** – Second edition of Ages & Stages Questionnaires: Social-Emotional (ASQ:SE) is published

Squires, J., Bricker, D., & Twombly, E. (2015). *Ages & Stages Questionnaires: Social-Emotional, Second Edition (ASQ:SE-2)*. Baltimore: Paul H. Brookes Publishing Co.

Ages and Stages Questionnaires: Social-Emotional (ASQ:SE)

Purpose:	**a) Target Group:** All children from 1 to 72 months of age. **b) Specifications:** • Developed as a complement to ASQ developmental screening tool. • The ASQ:SE-2 focuses on social and emotional behavior. • Parent-completed questionnaires that reliably identify children at risk for social or emotional difficulties. • 9 month intervals: (2-, 6-, 12-, 18-, 24-, 30-, 36-, 48-, 60 months). • Targets competence and problem behaviors, both external and internal. • Like the ASQ, the ASQ:SE has shown to be reliable and cost-effective as well as correlate well with pediatricians' and service providers' assessment. • Reliability: ➢ Test-retest: .89 (excellent) ➢ Internal consistency: .84 (excellent) • Validity: ➢ Investigated with more than 2.800 children ➢ .83 (excellent) • Sensitivity: ➢ .81 (excellent) • Specificity: ➢ .83 (excellent)

Squires, J., Bricker, D., & Twombly, E. (2015). *Ages & Stages Questionnaires: Social-Emotional, Second Edition (ASQ:SE-2)*. Baltimore: Paul H. Brookes Publishing Co.

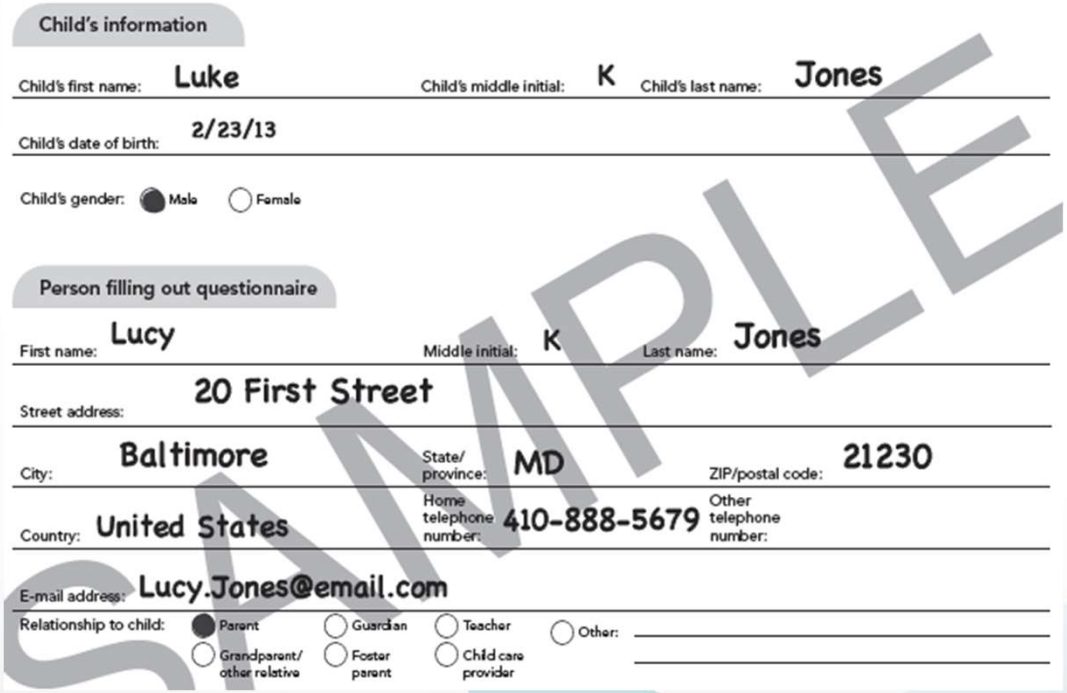
Ages and Stages Questionnaires: Social-Emotional (ASQ:SE)

Administration:	**a) Who administers:** The ASQ:SE were designed to be completed by parents, and also to be used by interventionists, nurses, and pediatricians **b) How long to administer:** between 10 to 15 minutes. **c) How much training is required:** None. **d) What kinds of support materials are available:** Specific guidelines are available in the ASQ:SE-2 User's Guide.
Scoring and Statistical Information	• Only caregivers who know the child well and spend more than 15–20 hours per week with the child should complete ASQ:SE-2. • The questions are answered based on what the caregiver knows about the child's usual behavior, not behavior when the child is sick, very tired, or hungry.

Squires, J., Bricker, D., & Twombly, E. (2015). *Ages & Stages Questionnaires: Social-Emotional, Second Edition (ASQ:SE-2)*. Baltimore: Paul H. Brookes Publishing Co.

Ages and Stages Questionnaires: Social-Emotional (ASQ:SE-2)

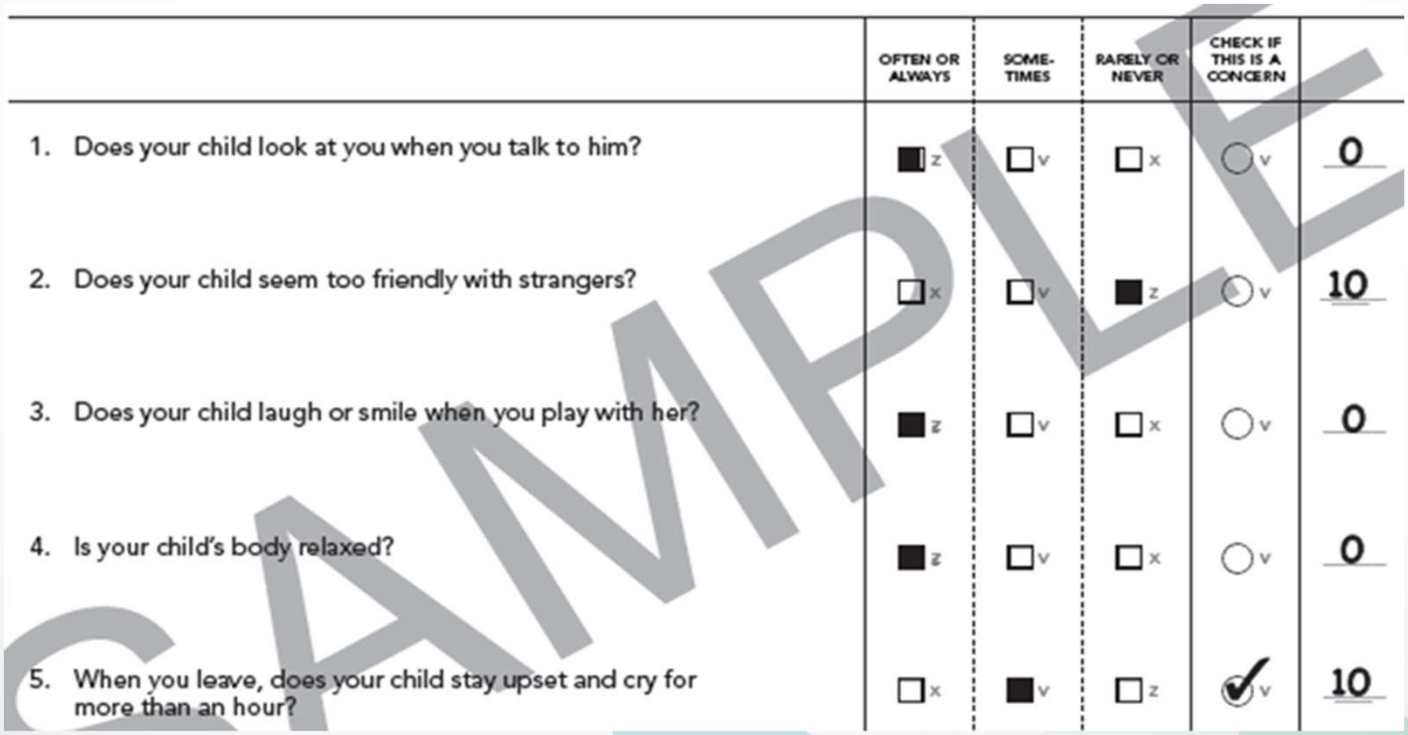
Scoring and Statistical Information
In the ASQ:SE-2 each age questionnaire is composed by the following sections: I. Child's information (name, gender, age) II. Person filling out questionnaire information (name, address, relationship to the child, contact) III. Program information (child ID number, program ID number, program name)



Squires, J., Bricker, D., & Twombly, E. (2015). *Ages & Stages Questionnaires: Social-Emotional, Second Edition (ASQ:SE-2)*. Baltimore: Paul H. Brookes Publishing Co.

Ages and Stages Questionnaires: Social-Emotional (ASQ:SE-2)

Scoring and Statistical Information	IV. Each question can be answer as “OFTEN OR ALWAYS”, “SOMETIMES” or “RARELY OR NEVER” ➢ In each question there is a option “CHECK IF THIS IS A CONCERN” to highlight the major priorities and concerns of the caregiver V. Overall questions (YES/NO) with space for additional comments ➢ Depending on the responses on the overall question, additional follow-up may be required.

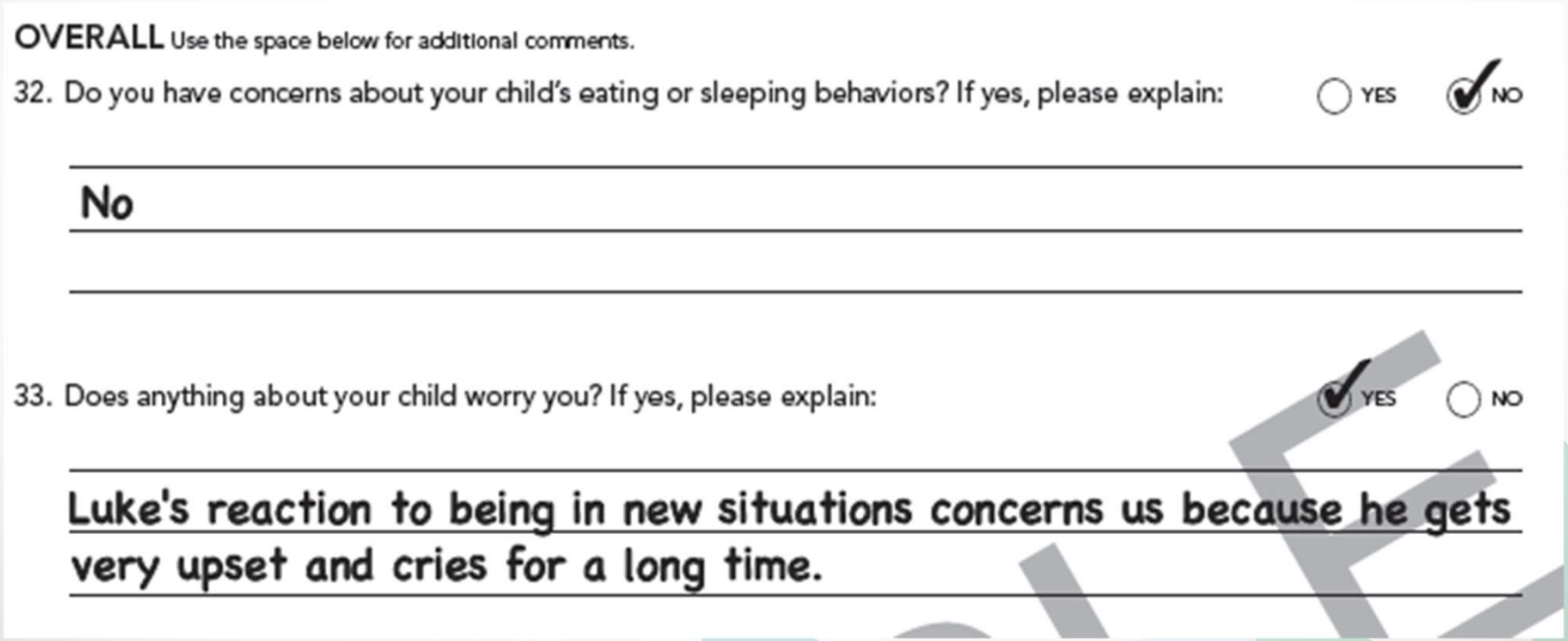


	OFTEN OR ALWAYS	SOME-TIMES	RARELY OR NEVER	CHECK IF THIS IS A CONCERN	
1. Does your child look at you when you talk to him?	■ z	□ v	□ x	◯ v	0
2. Does your child seem too friendly with strangers?	□ x	□ v	■ z	◯ v	10
3. Does your child laugh or smile when you play with her?	■ z	□ v	□ x	◯ v	0
4. Is your child's body relaxed?	■ z	□ v	□ x	◯ v	0
5. When you leave, does your child stay upset and cry for more than an hour?	□ x	■ v	□ z	✓ v	10

Squires, J., Bricker, D., & Twombly, E. (2015). *Ages & Stages Questionnaires: Social-Emotional, Second Edition (ASQ:SE-2)*. Baltimore: Paul H. Brookes Publishing Co.

Ages and Stages Questionnaires: Social-Emotional (ASQ:SE-2)

Scoring and Statistical Information	V. Overall questions (YES/NO) with space for additional comments ➢ Depending on the responses on the overall question, additional follow-up may be required.



OVERALL Use the space below for additional comments.

32. Do you have concerns about your child's eating or sleeping behaviors? If yes, please explain: ○ YES ☑ NO

No

33. Does anything about your child worry you? If yes, please explain: ☑ YES ○ NO

Luke's reaction to being in new situations concerns us because he gets very upset and cries for a long time.

Squires, J., Bricker, D., & Twombly, E. (2015). *Ages & Stages Questionnaires: Social-Emotional, Second Edition (ASQ:SE-2)*. Baltimore: Paul H. Brookes Publishing Co.

Ages and Stages Questionnaires: Social-Emotional (ASQ:SE-2)

Scoring and Statistical Information	• Each item is scored: ✓ OFTEN OR ALWAYS = 0 ✓ SOMETIMES = 5 ✓ RARELY OR NEVER = 10 ✓ IF IT'S A CONCERN = +5 • The item scores are added and the total is compared to the cutoff scale, identifying if there ir "NO OR LOW RISK", need to "MONITOR" or to "REFER" to services. • After the completion of the questionnaire, a professional shares the results with the parents. • Follow-up actions (if needed) are identified in the results sheet

1. **ASQ:SE-2 SCORING CHART:**
   - Score items (*Z* = 0, *V* = 5, *X* = 10, *Concern* = 5).
   - Transfer the page totals and add them for the total score.
   - Record the child's total score next to the cutoff.

TOTAL POINTS ON PAGE 1	15
TOTAL POINTS ON PAGE 2	5
TOTAL POINTS ON PAGE 3	5
TOTAL POINTS ON PAGE 4	10
Total score	**40**

Cutoff	Total score
65	40

2. **ASQ:SE-2 SCORE INTERPRETATION:** Review the approximate location of the child's total score on the scoring graphic. Then, check off the area for the score results below.

✓ The child's total score is in the ☐ area. It is below the cutoff. Social-emotional development appears to be on schedule.
___ The child's total score is in the ▭ area. It is close to the cutoff. Review behaviors of concern and monitor.
___ The child's total score is in the ■ area. It is above the cutoff. Further assessment with a professional may be needed.

Squires, J., Bricker, D., & Twombly, E. (2015). *Ages & Stages Questionnaires: Social-Emotional, Second Edition (ASQ:SE-2)*. Baltimore: Paul H. Brookes Publishing Co.

Ages and Stages Questionnaires (ASQ)

To consider…

- Easy to be applied by parents or other caregivers
- User friendly language
- Provides quantitative score
- Excellent psychometric properties. Validity has been examined across different cultures and communities across the world
- Widespread use in research studies
- Doesn’t guide directly for intervention
- Parents might need emotional support to face and understand some of the critical areas of the child development

References

- Singha, A., Yehb, C. J., & Blanchard, S. B. (2017). Ages and Stages Questionnaire: a global screening scale. *Boletín Médico del Hospital Infantil de México, 74(1),* 5-12.

- Squires, J. & Bricker, D. (2009). *Ages & Stages Questionnaires, Third Edition (ASQ-3). A parent-completed child-monitoring system*. Baltimore: Paul H. Brookes Publishing Co.

- Squires, J., Bricker, D., & Twombly, E. (2015). *Ages & Stages Questionnaires: Social-Emotional, Second Edition (ASQ:SE-2)*. Baltimore: Paul H. Brookes Publishing Co.

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Children and Family Assessment Instruments

Early Intervention

Routines-Based Interview (RBI)

Title, Edition, Dates of Publication	McWilliam, R. A. Family-centered intervention planning: A routines-based approach. Tucson, AZ: Communication Skill Builders; 1992.
Authors:	Robin A. McWilliam
Costs:	Free
Age Range:	For every child and family
Type of test:	Semi-structured interview
Purpose:	**Specifications:** 1. Designed to help families decide on outcomes/goals for their individualized plans; 2. Provide a rich and thick description of child and family functioning; 3. Establish an immediately positive relationship between the family and the professional.
Domains	Four areas: (i) Engagement; (ii) Independence; (iii) Social relationships; (iv) Satisfaction with routines

Routines-Based Interview (RBI)

History	RBI was originally developed by R. A. McWilliam (1992) as a method that can capture needs, resources, functional task demands, family-level needs, and family priorities, respecting the principles of family centeredness and functionality.
Protocol Information	The semistructured interview must contain the following criteria to be considered a RBI: 1. **Main concerns:** in the beginning of the interview the family should be asked what their main concerns are, so they can be listed and used in the conversation about the daily routines. 2. **Description of the routines of the day:** the family starts to describe how the day begins. To move to one time of the day to another, the family should be asked what happens next. The interviewer should find the answers to the following questions. 1. What everyone in the family is doing at that time 2. What the child does 3. The child's engagement 4. The child's independence 5. The child's social relationships 6. The family satisfaction the routine

Routines-Based Interview (RBI)

Protocol Information	The interviewer should have a clear understanding of the routine, asking for more details if needed. 3. **Star concerns:** when the family describe something as not going well, would to be different, think the child will be able to do next, or that raises a red flag for the interviewer, the latter makes a note and puts a star next to it the interview form. 4. **Satisfaction ratings:** at the end of each routine the interviewer asks the family to rate their satisfaction with the routine, in a scale of 1 (less satisfaction) to 5 (more satisfaction) 5. **Worry and change questions:** once the whole day is completed, the family should be asked two questions: • When you lie at night, worrying, what is it you worry about? • If there's anything you could change in your life, what would it be? 6. **Recap:** summary of the important information emanating from the interview namely the child-level needs, child-related family needs and family-level needs. 7. **Family chooses outcomes:** the family is asked to list the things they would like to work on 8. **Priority order:** after listing the outcomes and goals, as long as there are at least 6 of them, the family is asked to number them in order of importance.

Routines-Based Interview (RBI)

Administration	**a) Who administers:** Early intervention professionals. **b) How long to administer:** 2 hours. Families should be warned of the duration and that it's an intense conversation requiring a distraction-free environment. **c) How much training is required:** Ideally, interviewers should be trained to conduct the RBI. On the other hand, with the consultation of the protocol (McWilliam, 2009), a professional who is knowledgeable about child development, knowledgeable about child and family functioning, and who has good interview skills should be able to conduct a successful RBI. **d) What kinds of support materials are available:** The protocol for RBI (McWilliam, 2009) is available in the Siskin Children's Institute webpage: www.siskin.org Other materials published by the author are also supportive (McWilliam, 2010). **e) Video example of a RBI made by the author Robin McWilliam:** https://fraim.com/player/dKcl9?layout=landscape&source=post_page-----e766d7a1aa08----------

Routines-Based Interview (RBI)

To consider…

- Guides intervention towards meaningful goals for the child and family.
- Provides deep understanding of the child functional behavior (engagement, independence, and social relationships) in the daily activities.
- Clarifies which roles each member of the family or caregivers are playing in every routine.
- Helps to identify the resources available in the natural environment of the child and family.
- Might take a long time to apply it (more than 2 hours).
- The interview process might be biased depending on the professional background or specific area.

References

- McWilliam, R. A. (1992). *Family-centered intervention planning: A routines-based approach*. Tucson, AZ: Communication Skill Builders.
- McWilliam, R. A. (2003). *The RBI Report Form.* Nashville, TN: Center for Child Development, Vanderbilt University Medical Center.
- McWilliam, R. A. (2009). The Routines-Based Interview A Method for Gathering Information and Assessing Needs. *Infants & Young Children, 3(22),* 224-233.
- McWilliam, R. A. (2010). *Routines-based Early Intervention.* Baltimore, MD: Paul H. Brooks Publishing Co.

Scale for the Assessment of Teachers' Impressions of Routines and Engagement (SATIRE)

Title, Edition, Dates of Publication	*Scale for the Assessment of Teachers' Impressions of Routines and Engagement (SATIRE)*, First edition, 2003
Authors:	Beth T. Clingenpeel & Robin A. McWilliam
Costs:	Free
Age Range:	For every child in school age
Type of test:	Semi-structured interview
Purpose:	**Specifications:** 1. The SATIRE is an assessment tool designed to be used in conjunction with the routines-based interview (RBI) 2. For professionals in preschool programs and child care centres who work with teachers and families to develop functional intervention plans for children with special needs 3. Gathers information about how the child functions during classroom routines
Domains	Four domains: (i) Engagement; (ii) Independence; (iii) Social relationships; and (iv) Goodness of fit of the classroom environment to the child needs

Scale for the Assessment of Teachers' Impressions of Routines and Engagement (SATIRE)

Administration	**a) Who administers:** Early intervention professionals and Early Childhood Educators. **b) How long to administer:** up to 2 hours. **c) How much training is required:** Ideally, interviewers should be trained to conduct the SATIRE. On the other hand, with the consultation of the protocol, a professional who is knowledgeable about child development, knowledgeable about child and family functioning, and who has good interview skills should be able to conduct a successful RBI. **d) What kinds of support materials are available:** The instructions for SATIRE (Clingenpeel & McWilliam, 2003) are available in http://edn.ne.gov/cms/sites/default/files/satire.pdf. The RBI protocol principles are also supportive (McWilliam, 2010).

Scale for the Assessment of Teachers' Impressions of Routines and Engagement (SATIRE)

Administration	The professional makes appropriate questions under each classroom routine, making notes of the teacher's response. Professionals are encouraged to develop their own questions to follow up with each teacher's unique experiences. Important information to gather: • What the child does during each routine, • What the other children do during each routine, and • The teacher's perception of the goodness of fit between the routine and the child's functioning. Teacher perception is assessed by using a 1 to 5 scale for each routine discussed: **1. Poor goodness of fit** **2.** **3. Average goodness of fit** **4.** **5. Excellent goodness of fit (match)**

Scale for the Assessment of Teachers' Impressions of Routines and Engagement (SATIRE)

Administration	Asking about the teacher's impression is important, as a discrepancy between the teacher's expectations for a child in a particular routine and what actually happens might signal the need for intervention. The interviewer should pay particular attention to determining the child's: • Engagement (i.e., attention, participation, and goal-directed behaviour), • Independence • Social relationships with adults and peers during each routine.

Scale for the Assessment of Teachers' Impressions of Routines and Engagement (SATIRE)

To consider…

- Guides intervention towards meaningful goals for the child and the early childhood educators
- Provides deep understanding of the child functional behavior (engagement, independence, and social relationships) in the school settings
- Clarifies which roles the child is playing in the school routine
- Helps to identify the resources available in the school environment
- Might take a long time to apply it (more than 2 hours)
- The interview process might be biased depending on the professional background or specific area

References

- Clingenpeel, B. & McWilliam, R. (2003). *Scale for the Assessment of Teachers Impressions of Routines and Engagement (SATIRE)*. Vanderbilt University Medical Center: Center of Child Development.
- McWilliam, R. A. (2010). *Routines-based Early Intervention.* Baltimore, MD: Paul H. Brooks Publishing Co.

Ecomap

Title, Edition, Dates of Publication and Revision	Hartman, A. (1978). Diagrammatic assessment of family relationships. Social Casework, 59, pp. 465–476 Hartman, A. & Laird, J. (1983). Family-centered social work practice. New York: The Free Press.
Authors:	Ann Hartman
Costs:	Free
Age Range:	For every child and family.
Type of test:	Graphic representation
Domains	Social and Ecological assessment

Ecomap

History:	**1975** - The ecomap is an instrument that has emerged with Hartman (1978) due to the author's practice as a social worker, looking to schematize a representation of the social networks of an individual or a family.
Purpose:	• An ecomap is a graphic representation (map or drawing) of the nuclear family surrounded by the families informal, formal, and intermediate support(s). • The ecomap provides a representation of an individual or a family ecology and existing levels of support. • It stresses the positive and negative relationships established between the family or its elements with the outside world, allowing the identification of areas of conflict and areas of compatibility between the family system and the context. This perspective may facilitate the identification of needs and opportunities. • Sustains the message that Early Intervention is concerned with the whole family, not just the child. • Ecomaps give workers a comprehensive picture of many things, to include: family dynamics, connections to their social systems and the community, the family unit's level of connection to the external world, areas of deprivation where resources may be needed or strengthened, and areas of service duplication

Ecomap

Administration	a) **Who administers:** Early intervention professionals. b) **How long to administer:** From 10-15 minutes. c) **How much training is required:** Ideally, interviewers should be trained to represent the ecomap. Alternatively, support materials can be consulted. • The squares or circles in the ecomap represent the members of a family (a household, for example). • The family should be represented in the center of the graphic, with the remaining people or services being represented around the family. • The connections between the family and the other agents are represented by a line. • A continuous line represents a strong and generally positive bond, a dotted line represents a conflicting or stress between the family and the other person/service.

Ecomap

Administration	• **Types of Support:** ➢ Informal: these supports go at the top of the ecomap. They consist of family, friends, and neighbors. ➢ Formal: these supports go at the bottom of the ecomap. They consist of doctors, therapists, early interventionists, and financial assistance. Formal supports can also be thought of as anyone who is paid to be nice to the family. ➢ Intermediate: these supports consist of parents jobs and go to the sides of central box. • **Connecting lines to indicate levels of support:** ➢ Wide line: a lot of support ➢ Medium lime: some support ➢ Single line: present ➢ Broken line: source of stress ➢ Arrow toward that person: indicates the direction of the support (unidirectional, bidirectional)

Ecomap

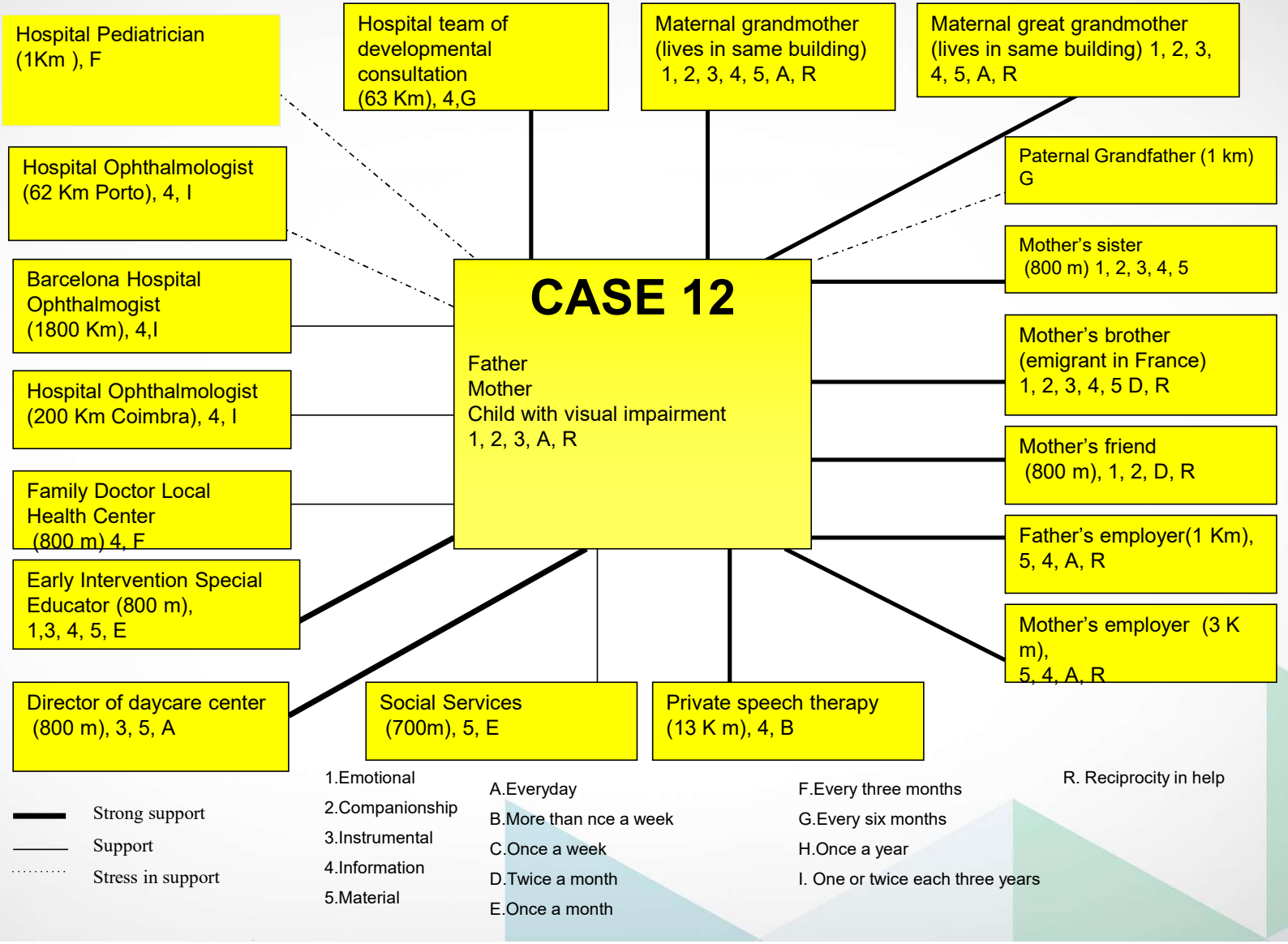
Administration	**d) Examples of questions:** • Who lives in the home with you and your child? • If siblings in the home, how old? • Do you have family that lives close by? • Are your parents alive and together? • Do you have any siblings? • If something cool happened with one of your children, who would you call/tell? If applicable, who would your spouse tell? • If you had news to share, whether it was good or bad news, who would you call? • Tell me about your neighbors. • Is your child receiving any other services? How often? • Are any of your other children receiving any services? • Who is your pediatrician? • What sort of financial support does your family receive? • What does your family like to do in your free time?

Ecomap

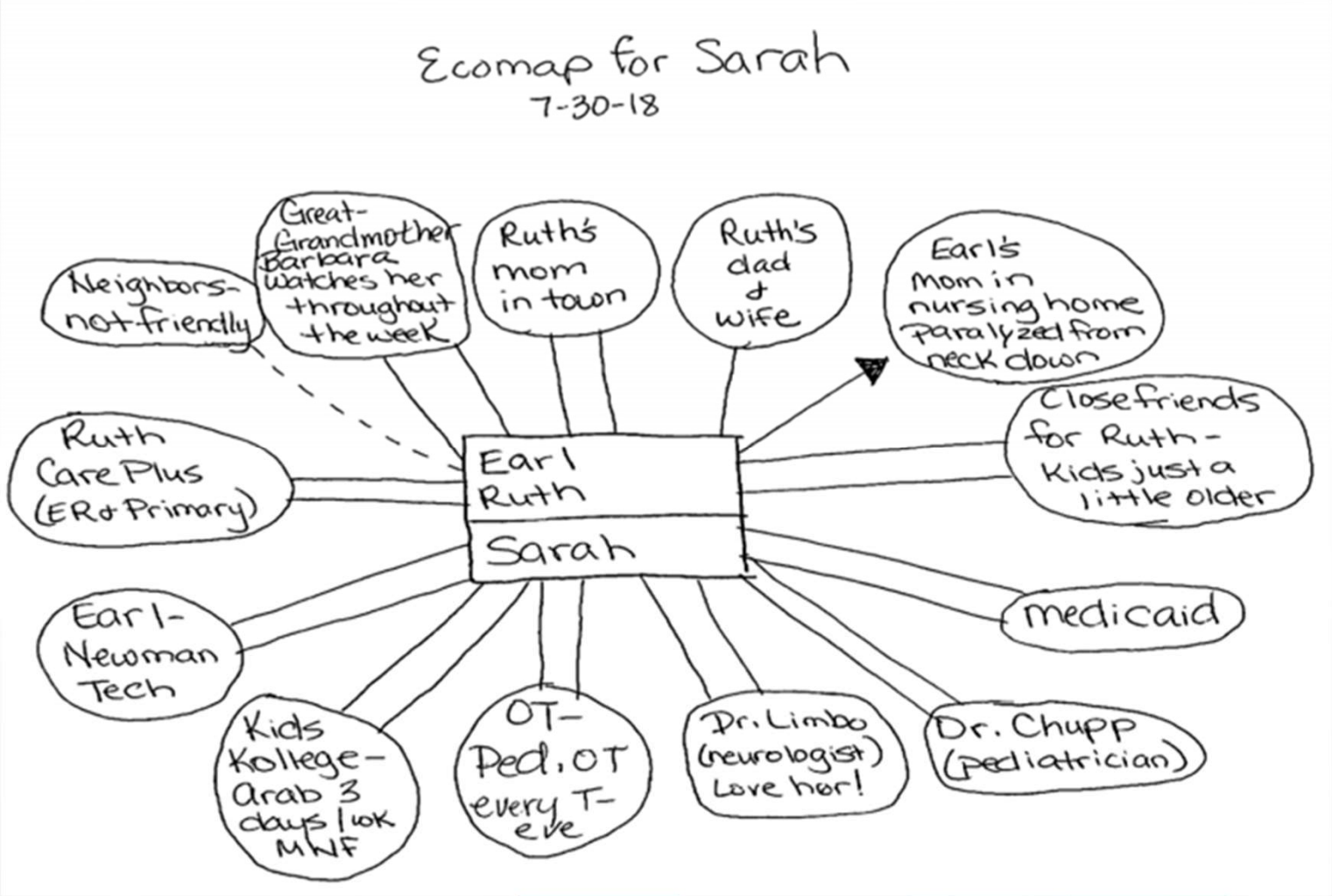
Administration	**e) Recommendations:** • DO: ✓ Make eye contact ✓ Use active listening ✓ Show interest ✓ Be sensitive to the family's responses ✓ Ask open-ended questions ✓ Watch your body language • DON'T DO: X Look at your ecomap the whole time X Miss what the family has said X Just go through the motions X Judge the family's responses X Assume anything X Have a lot of dead time (writing)

Example

ECOMAP



Example


Ecomap for Sarah
7-30-18
Great-Grandmother Barbara watches her throughout the week
Ruth's mom in town
Ruth's dad & wife
Earl's mom in nursing home paralyzed from neck down
Neighbors- not friendly
Close friends for Ruth- Kids just a little older
Ruth Care Plus (ER & Primary)
Earl
Ruth
Sarah
Earl- Newman Tech
medicaid
Kids Kollege- Arab 3 days/wk MWF
OT- Ped. OT every T-eve
Dr. Limbo (neurologist) Love her!
Dr. Chupp (pediatrician)

Ecomap

To consider…

- Identifies the resources available in the environment of the child and family.
- Helps to identify key elements for the child and family.
- Identifies the family stressors and provides opportunity to discuss it.
- Parents may need professional guidance to draw their ecomap.

References

- Brown, B. & Pittard, W. (2018). *The importance of completing an ecomap.* Alabama's Early Intervention System. Retrieved in: [http://ucpalabama.org/wp-content/uploads/2018/10/Ecomap-Presentation.pdf].
- Hartman, A. (1978). Diagrammatic assessment of family relationships. *Social Casework, 59*, 465–476
- Hartman, A. & Laird, J. (1983). *Family-centered social work practice*. New York: The Free Press.
- McWilliam, R. A. (2010). *Routines-based Early Intervention.* Baltimore, MD: Paul H. Brooks Publishing Co.

The Carolina Curriculum

Two manuals

Title, Edition, Dates of Publication	1) The Carolina Curriculum for Infants & Toddlers with Special Needs (CCITSN), Third Edition; 2004 2) The Carolina Curriculum for Preschoolers with Special Needs (CCPSN), Second Edition; 2004
Authors	Nancy Johnson-Martin; Susan Attermeier; Bonnie Hacker
Costs	**3 Components: The Curriculum; Assessment Log and Developmental Progress Chart** $54.95 for Curriculum (each manual); $30.00 for package of 10 assessment logs that include the developmental progress chart; $150.00 for master forms on CD or E-book (includes both manuals). (https://brookespublishing.com/product/the-carolina-curriculum/)
Age Range	1) Birth to 3 years. 2) 2-5 years.
Type of test	1) Informal observation and directed assessment. Not standardized.
Purpose	Is an **assessment and intervention program** designed for all young children with typical and atypical development, in order to: assess previously identified children, plan and perform intervention and document progress.
Domains	Development of young children in 5 different domains: (i) cognition; (ii) communication; (iii) personal-social; (iv) fine motor; and (v) gross motor.

Brookes Publishing: The Carolina Curriculum for Infants and Toddlers with Special Needs (CCITSN), Third Edition. (2004). Retrieved March 1, 2019, from https://products.brookespublishing.com/The-Carolina-Curriculum-for-Infants-and-Toddlers-with-Special-Needs-CCITSN-Third-Edition-P485.aspx
Brookes Publishing: The Carolina Curriculum for Preschoolers with Special Needs (CCPSN) Assessment Log and Developmental Progress Chart, Second Edition. (2004). Retrieved March 1, 2019, from https://products.brookespublishing.com/The-Carolina-Curriculum-for-Preschoolers-with-Special-Needs-CCPSN-Assessment-Log-and-Developmental-Progress-Chart-Second-Edition-P488.aspx

The Carolina Curriculum

The Carolina Curriculum for Infants & Toddlers with Special Needs
The Carolina Curriculum for Preschoolers with Special Needs

History	Is an instrument that has emerged in the United States of America **for early intervention services**. • **1986** = The first edition of The Carolina Curriculum for Handicapped Infants and Infants at Risk (Johnson-Martin, Jens, & Attermeier). • **1990** = The authors develop a companion volume, The Carolina Curriculum for Preschoolers With Special Needs. • **1991** = The infant curriculum was revised and created The Carolina Curriculum for Infants and Toddlers with Special Needs, Second Edition. • CCITSN has been translated into Portuguese, Russian, Korean, Chinese, Spanish, and Italian. CCPSN has been translated into Korean. • It has been used to **promote child engagement, learning, participation and independence in everyday activities and routines.** • Age levels were estimated on information from standardized instruments and the literature on infant and toddler development (e.g.: Bayley, 1993; Bzoch, League & Brown, 1991; Folio & Fewell, 2000; Rosseti, 1990; Sparrow, Ball & Cicchetti, 1984; Zimmerman et al., 2002).

Johnson-Martin, N., Attermeier, S. M., & Hacker, B. J. (2005). *Currículo Carolina para Bebés e Crianças Pequenas com Necessidades Especiais, 3ª Edição*, Tradução e Adaptação Portuguesa Magda Machado e António Menezes Rocha do Departamento de Investigação e Publicações Psicológicas. Lisboa: CEGOC-TEA

The Carolina Curriculum. (2019). Retrieved March 1, 2019, from Brookes Publishing Co. website: https://brookespublishing.com/product/the-carolina-curriculum/

The Carolina Curriculum. (2019). Retrieved March 1, 2019, from Brookes Publishing Co. website: from http://archive.brookespublishing.com/documents/carolina-osep-crosswalk.pdf

The Carolina Curriculum

Assessment

- **Fill the Assessment Log** with information gathered from the following sources:
  - Observation
  - Interview: Parents and Educator
  - Directed Assessment
- Fill the **Developmental Progress Chart**

Goals Selection

- List the next skills to be developed
- Together with parents, set the goals by selecting some skills from each of the developmental areas.

Intervention Program

Combine two or more goals into various specific activities and/or integrate between three and five goals into daily activities (e.g.: play in playground, meal time)

Johnson-Martin, N., Attermeier, S. M., & Hacker, B. J. (2005). *Currículo Carolina para Bebés e Crianças Pequenas com Necessidades Especiais, 3ª Edição*, Tradução e Adaptação Portuguesa Magda Machado e António Menezes Rocha do Departamento de Investigação e Publicações Psicológicas. Lisboa: CEGOC-TEA

The Carolina Curriculum

Protocol Information	a) The **assessment is linked to intervention** through hierarchies of developmental tasks. All the areas to be assessed are laid out in a **logical sequences** of an **Assessment Log**. CCITSN includes 24 logical teaching sequences covering the 5 developmental domains and CCPSN includes 22**.** **a) Each item**, on the assessment tool, **is linked to a curriculum item** that describes materials and procedures for the assessed skill, and also suggests functional activities that promote the development of the skill described in each item. The Carolina Curriculum suggests adaptations for children with visual, motor, and hearing impairments. a) The professional observes the child playing in a natural environment with parents, familiar adults and peers (playground, classroom, meal time). After all the activities have been observed, professionals and caregivers examine the strengths and weaknesses revealed, indicating items that require further attention. a) When the child does not perform an item, parent/caregiver/educator can be instructed to try particular activity with the child. Parents are asked about the child´s skills when observation and directed assessment does not elicit behaviors from the child.

Johnson-Martin, N., Attermeier, S. M., & Hacker, B. J. (2004). *The Carolina Curriculum for Infants and Toddlers with Special Needs*. P.H. Brookes Publishing Company.

Brookes Publishing: The Carolina Curriculum for Infants and Toddlers with Special Needs (CCITSN), Third Edition. (2004). Retrieved March 1, 2019, from https://products.brookespublishing.com/The-Carolina-Curriculum-for-Infants-and-Toddlers-with-Special-Needs-CCITSN-Third-Edition-P485.aspx

Assessment Log

Scored items:

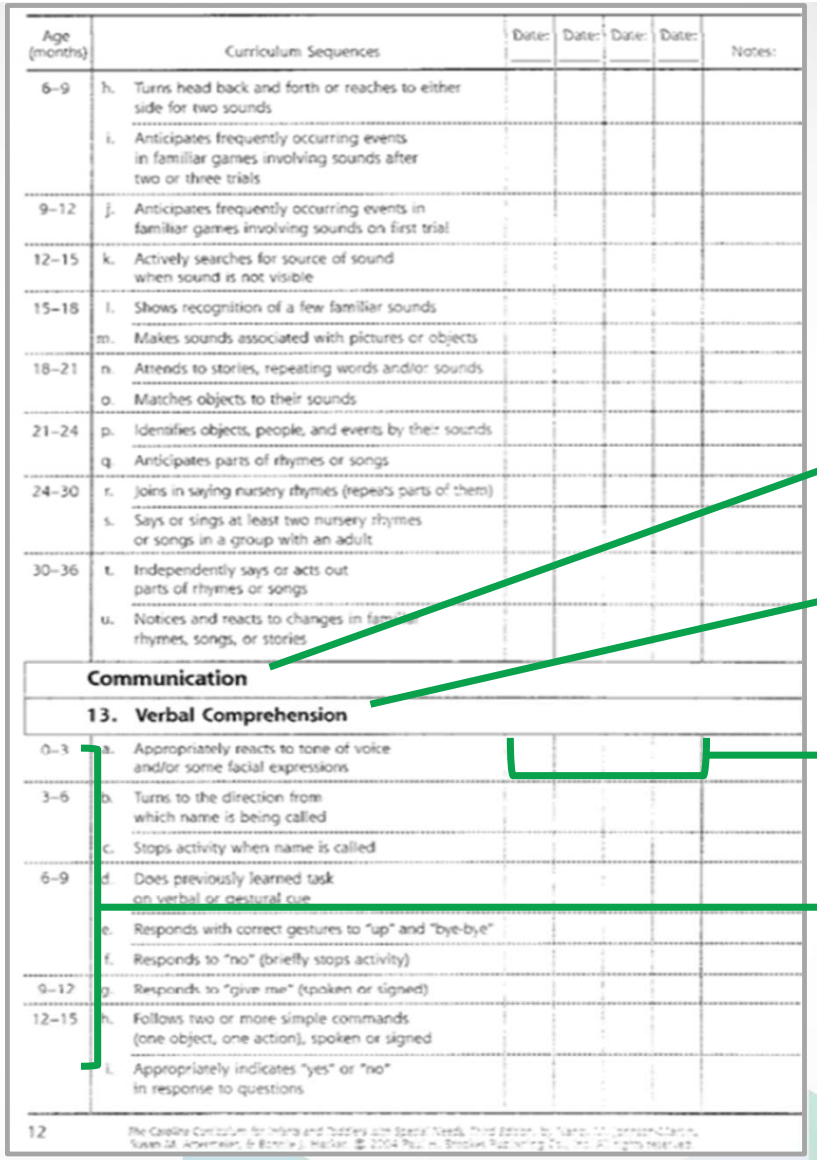
+ = present and generalized

+/- = emerging skill

- = not observed or reported

A = physical support

Apply the items until the child succeeds in all of them and cannot complete the items at the following age range.



Age (months)	Curriculum Sequences	Date:	Date:	Date:	Date:	Notes:
6–9	h. Turns head back and forth or reaches to either side for two sounds					
	i. Anticipates frequently occurring events in familiar games involving sounds after two or three trials					
9–12	j. Anticipates frequently occurring events in familiar games involving sounds on first trial					
12–15	k. Actively searches for source of sound when sound is not visible					
15–18	l. Shows recognition of a few familiar sounds					
	m. Makes sounds associated with pictures or objects					
18–21	n. Attends to stories, repeating words and/or sounds					
	o. Matches objects to their sounds					
21–24	p. Identifies objects, people, and events by their sounds					
	q. Anticipates parts of rhymes or songs					
24–30	r. Joins in saying nursery rhymes (repeats parts of them)					
	s. Says or sings at least two nursery rhymes or songs in a group with an adult					
30–36	t. Independently says or acts out parts of rhymes or songs					
	u. Notices and reacts to changes in familiar rhymes, songs, or stories					
	Communication					
	13. Verbal Comprehension					
0–3	a. Appropriately reacts to tone of voice and/or some facial expressions					
3–6	b. Turns to the direction from which name is being called					
	c. Stops activity when name is called					
6–9	d. Does previously learned task on verbal or gestural cue					
	e. Responds with correct gestures to "up" and "bye-bye"					
	f. Responds to "no" (briefly stops activity)					
9–12	g. Responds to "give me" (spoken or signed)					
12–15	h. Follows two or more simple commands (one object, one action), spoken or signed					
	i. Appropriately indicates "yes" or "no" in response to questions					
12	The Carolina Curriculum for Infants and Toddlers with Special Needs, Third Edition, by Susan R. Johnson, Ph.D., Nancy J. Attermeier, Ed.D., & Barbara J. Hacker, M.S. © 2004 Paul H. Brookes Publishing Co., Inc. All rights reserved.					

Domain and Sequence

Titles of Items

Dates: 4 Assessments to monitor progress.

Age ranges

Johnson-Martin, N., Attermeier, S. M., & Hacker, B. J. (2004). *The Carolina Curriculum for Infants and Toddlers with Special Needs*. P.H. Brookes Publishing Company.

Gooden, C. (2007). Carolina curriculum for infants and toddlers with special needs with special needs (ccitsn), 3rd Ed. Retrieved March 1, 2019, from https://www.kedsonline.org/CCITSN%20for%20First%20Steps%2011-1-07%20UPDATED.pdf

Curriculum Item

5dd. Recognizes familiar signs
(e.g., restaurants, traffic lights, stop signs, labels on food)

MATERIALS Magazines with pictures containing familiar signs, labels (or parts of labels) from food or juice containers (not a label with pictures of the contents, but a label with words and/or a logo). Depending on the child's experience, some possible examples are the top half of a Cheerios box or other cereal boxes (with the name of the cereal and the color of the box evident but no picture of a bowl of cereal); Kool-Aid packages; and labels from various kinds of juice, chips, or cracker packages.

PROCEDURES

Look through a magazine with the child and ask, "What's that?" when you see an advertisement that shows a familiar logo.

Collect a group of labels that should be familiar to the child. Glue them into a notebook, and leaf through the pages with the child. Ask what each one is. If he does not know, tell him. See if he remembers the next time you look through the book.

DAILY ROUTINES & FUNCTIONAL ACTIVITIES

When preparing the child a snack or a meal, show him the labels of the packages you are using. Similarly, when you are shopping with the child, show him the things you are taking off of the shelves and name them for him.

When driving in the car, point out stop signs and signs of stores or fast-food places you visit frequently.

Watch and listen for the child to point at one of the food labels or signs saying something that indicates he recognizes the sign, whether it is a brand name or something that the child associates with that name. For example, the child would get credit for saying "McDonald's" when he sees the arches, but he also would get credit for saying "fries."

CRITERION The child recognizes and labels five different familiar signs.

5

For each item it is described:
- Type of materials to be used
- Procedures
- Daily Routines and Functional Activities
- Criterion (to determine if the child masters or not that skill).

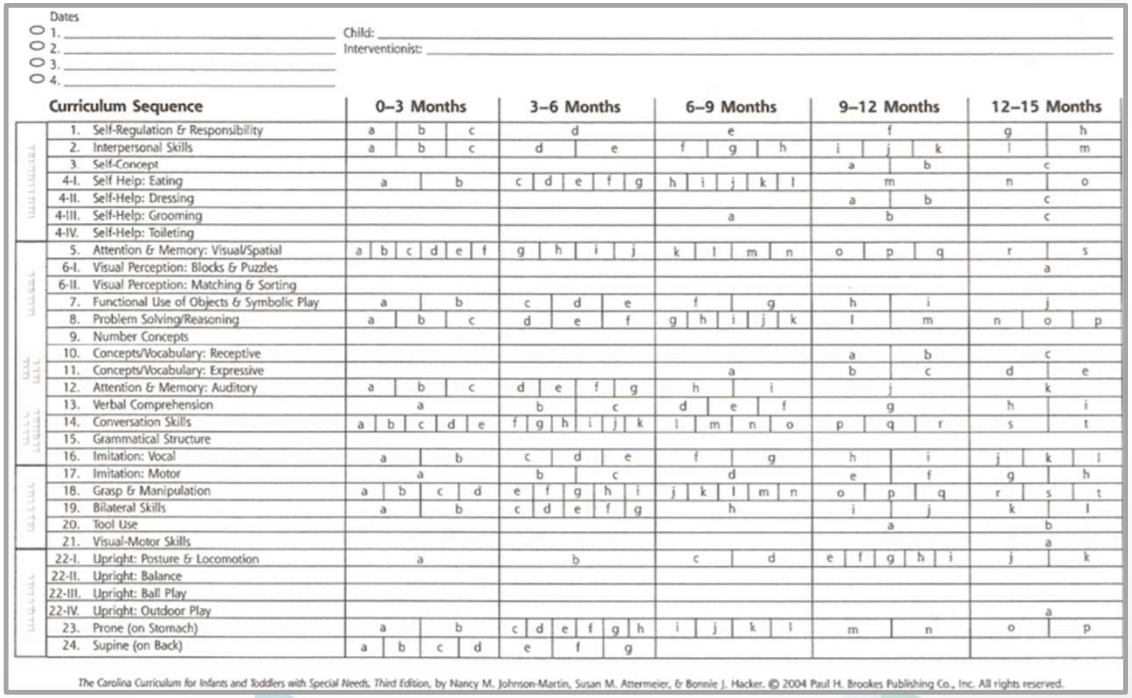
The behavior must be observed on more than one occasion and under different circumstances.

Johnson-Martin, N., Attermeier, S. M., & Hacker, B. J. (2004). *The Carolina Curriculum for Infants and Toddlers with Special Needs*. P.H. Brookes Publishing Company.

Gooden, C. (2007). Carolina curriculum for infants and toddlers with special needs with special needs (ccitsn), 3rd Ed. Retrieved March 1, 2019, from https://www.kedsonline.org/CCITSN%20for%20First%20Steps%2011-1-07%20UPDATED.pdf

The Carolina Curriculum

Protocol Information	Every item on the Assessment Log is represented by a blank on the **Developmental Progress Chart** that professionals fill in completely, partially, or not, depending on the level of child´s skills. This chart help professionals to **summarize** what they learned from the Assessment Log.



Dates
1. _____
2. _____
3. _____
4. _____

Child: _____
Interventionist: _____

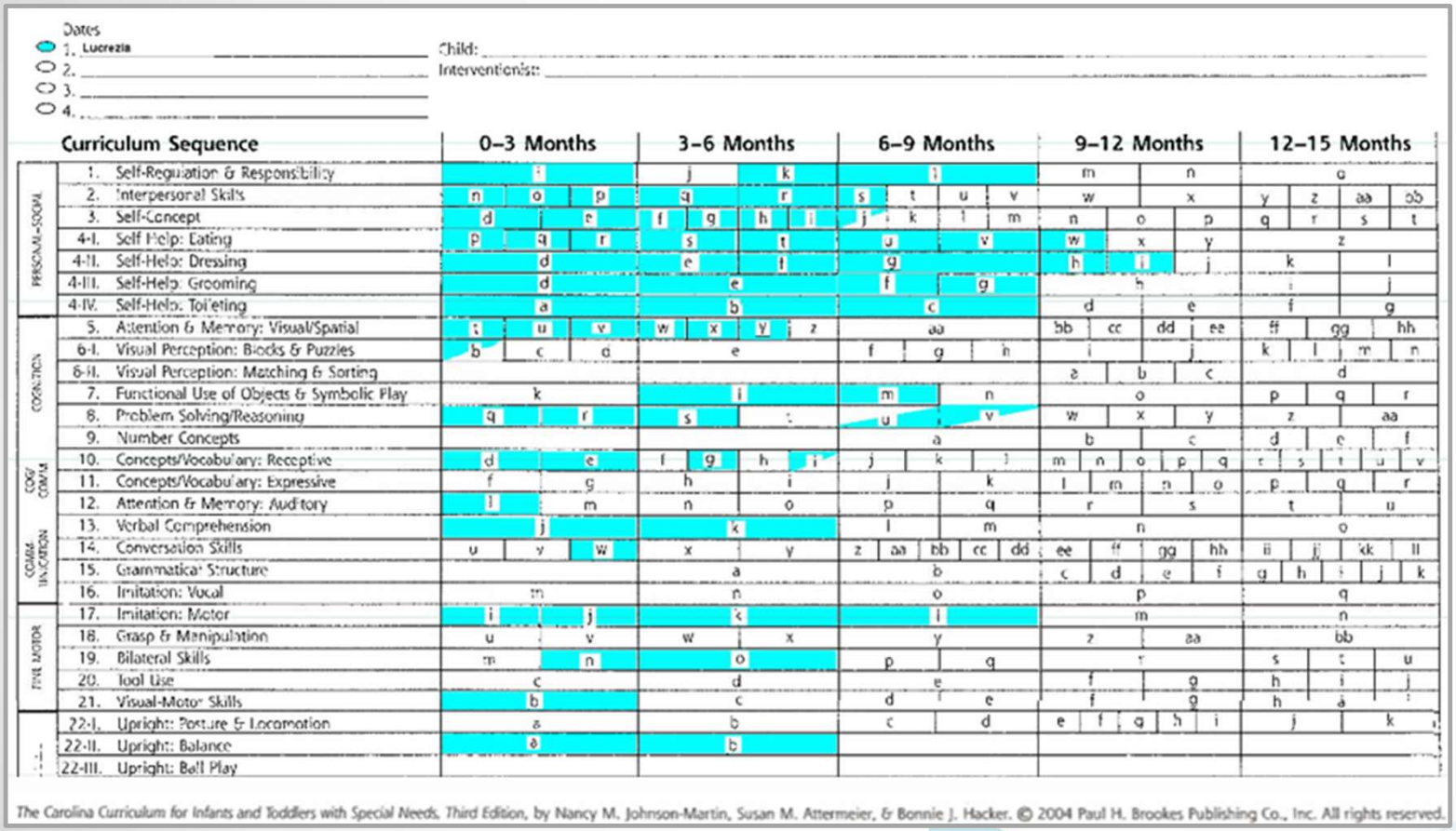
Curriculum Sequence	0–3 Months	3–6 Months	6–9 Months	9–12 Months	12–15 Months
1. Self-Regulation & Responsibility	a b c	d	e	f	g h
2. Interpersonal Skills	a b c	d e	f g h	i j k	l m
3. Self-Concept				a b	c
4-I. Self Help: Eating	a b	c d e f g	h i j k l	m	n o
4-II. Self-Help: Dressing				a b	c
4-III. Self-Help: Grooming			a	b	c
4-IV. Self-Help: Toileting					
5. Attention & Memory: Visual/Spatial	a b c d e f	g h i j	k l m n	o p q	r s
6-I. Visual Perception: Blocks & Puzzles					a
6-II. Visual Perception: Matching & Sorting					
7. Functional Use of Objects & Symbolic Play	a b	c d e	f g	h i	j
8. Problem Solving/Reasoning	a b c	d e f	g h i j k	l m	n o p
9. Number Concepts					
10. Concepts/Vocabulary: Receptive				a b	c
11. Concepts/Vocabulary: Expressive			a	b c	d e
12. Attention & Memory: Auditory	a b c	d e f g	h i	j	k
13. Verbal Comprehension	a	b c	d e f	g	h i
14. Conversation Skills	a b c d e	f g h i j k	l m n o	p q r	s t
15. Grammatical Structure					
16. Imitation: Vocal	a b	c d e	f g	h i	j k l
17. Imitation: Motor	a	b c	d	e f	g h
18. Grasp & Manipulation	a b c d	e f g h i	j k l m n	o p q	r s t
19. Bilateral Skills	a b	c d e f g	h	i j	k l
20. Tool Use				a	b
21. Visual-Motor Skills					a
22-I. Upright: Posture & Locomotion	a	b	c d	e f g h i	j k
22-II. Upright: Balance					
22-III. Upright: Ball Play					
22-IV. Upright: Outdoor Play					a
23. Prone (on Stomach)	a b	c d e f g h	i j k l	m n	o p
24. Supine (on Back)	a b c d	e f g			

Johnson-Martin, N., Attermeier, S. M., & Hacker, B. J. (2004). *The Carolina Curriculum for Infants and Toddlers with Special Needs*. P.H. Brookes Publishing Company.

Gooden, C. (2007). Carolina curriculum for infants and toddlers with special needs with special needs (ccitsn), 3rd Ed. Retrieved March 1, 2019, from https://www.kedsonline.org/CCITSN%20for%20First%20Steps%2011-1-07%20UPDATED.pdf

Developmental Progress Chart

Provide a visual record of strengths, needs and shows age ranges of child's skills



Dates
1. Lucrezia
2.
3.
4.

Child:
Interventionist:

Curriculum Sequence	0–3 Months	3–6 Months	6–9 Months	9–12 Months	12–15 Months
PERSONAL-SOCIAL					
1. Self-Regulation & Responsibility	h	j k	l	m n	o
2. Interpersonal Skills	n o p	q r	s t u v	w x	y z aa bb
3. Self-Concept	d e	f g h i	j k l m	n o p	q r s t
4-I. Self Help: Eating	p q r	s t	u v	w x y	z
4-II. Self-Help: Dressing	d	e f	g	h i j	k l
4-III. Self-Help: Grooming	d	e	f g	h	i j
4-IV. Self-Help: Toileting	a	b	c	d e	f g
COGNITION					
5. Attention & Memory: Visual/Spatial	t u v	w x y z	aa	bb cc dd ee	ff gg hh
6-I. Visual Perception: Blocks & Puzzles	b c d	e	f g h	i j	k l m n
6-II. Visual Perception: Matching & Sorting				a b c	d
7. Functional Use of Objects & Symbolic Play	k	i	m n	o	p q r
8. Problem Solving/Reasoning	q r	s t	u v	w x y	z aa
9. Number Concepts			a	b c	d e f
COG/COMM					
10. Concepts/Vocabulary: Receptive	d e	f g h i	j k l	m n o p q	r s t u v
11. Concepts/Vocabulary: Expressive	f g	h i	j k	l m n o	p q r
12. Attention & Memory: Auditory	l m	n o	p q	r s	t u
COMMUNICATION					
13. Verbal Comprehension	j	k	l m	n	o
14. Conversation Skills	u v w	x y	z aa bb cc dd	ee ff gg hh	ii jj kk ll
15. Grammatical Structure		a	b	c d e f	g h i j k
16. Imitation: Vocal	m	n	o	p	q
FINE MOTOR					
17. Imitation: Motor	i j	k	l	m	n
18. Grasp & Manipulation	u v	w x	y	z aa	bb
19. Bilateral Skills	m n	o	p q	r	s t u
20. Tool Use	c	d	e	f g	h i j
21. Visual-Motor Skills	b	c	d e	f g	h i
GROSS MOTOR					
22-I. Upright: Posture & Locomotion	a	b	c d	e f g h i	j k
22-II. Upright: Balance	a	b			
22-III. Upright: Ball Play					

Color in progress chart:

+ items = paints the entire square

+/- items = paints half of square (diagonal)

- Items = leave square blank

Johnson-Martin, N., Attermeier, S. M., & Hacker, B. J. (2004). *The Carolina Curriculum for Infants and Toddlers with Special Needs*. P.H. Brookes Publishing Company.

Gooden, C. (2007). Carolina curriculum for infants and toddlers with special needs with special needs (ccitsn), 3rd Ed. Retrieved March 1, 2019, from https://www.kedsonline.org/CCITSN%20for%20First%20Steps%2011-1-07%20UPDATED.pdf

Developmental Progress Chart

Use different colors for each assessment

Johnson-Martin, N., Attermeier, S. M., & Hacker, B. J. (2004). *The Carolina Curriculum for Infants and Toddlers with Special Needs*. P.H. Brookes Publishing Company.

Gooden, C. (2007). Carolina curriculum for infants and toddlers with special needs with special needs (ccitsn), 3rd Ed. Retrieved March 1, 2019, from https://www.kedsonline.org/CCITSN%20for%20First%20Steps%2011-1-07%20UPDATED.pdf

The Carolina Curriculum

The Carolina Curriculum for Infants & Toddlers with Special Needs
The Carolina Curriculum for Preschoolers with Special Needs

Administration	a) **Who administers:** Early childhood special educators, early interventionists and therapists or others with minimal experience and education in child development. a) **How long to administer:** Time varies with the age and skills of the child. Approximately 60-120 minutes. It can be split into 2 or more sessions. a) **How much training is required:** The assessor must understand and follow the instructions for assessing the skill that each item represents and engage in activities to promote the development of that skill. a) **What kinds of support materials are available:** Specific guidelines are available in the manual.

Johnson-Martin, N., Attermeier, S. M., & Hacker, B. J. (2004). *The Carolina Curriculum for Infants and Toddlers with Special Needs*. P.H. Brookes Publishing Company.

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The Carolina Curriculum

The Carolina Curriculum for Infants & Toddlers with Special Needs
The Carolina Curriculum for Preschoolers with Special Needs

To consider…

- Can be applied to any child (typical and atypical development).
- Assesses the five main domains of child development: cognition, communication, personal-social, fine motor and gross motor.
- It is not a standardized tool for every population, which means that professionals can make adjustments to assess each child.
- Provides guidance to intervention:
  - Each assessed item is linked to a curriculum item that describes strategies for teaching the assessed skill.
  - The curriculum links the assessment with activities towards promoting the skills that have not been mastered by the child.
- The Developmental Progress Chart provides a visual record of strengths, needs and shows age ranges of child's skills.
- The assessment does not provide a quantitative score.

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- Folio, M.R. & Fewell, R. (2000). *Peabody Development Motor Scales* (2nd ed.). Los Angeles: Western Psychological Services.
- Johnson-Martin, N., Attermeier, S. M., & Hacker, B. J. (2004). *The Carolina Curriculum for Infants and Toddlers with Special Needs*. P.H. Brookes Publishing Company.
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- Sparrow, S.S., Balla, D.A. & Cicchetti, D.V. (1984). *Vineland Adaptive Behavior Scales*. Circle Pines, MN: University of Illinois Press.
- Zimmerman, I.L., Steiner, V.G. & Pond, R.E. (2002). *Preschool Language Scale* (4th ed.). San Antonio, TX: Harcourt Brace & Co.

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- Brookes Publishing: The Carolina Curriculum for Preschoolers with Special Needs (CCPSN) Assessment Log and Developmental Progress Chart, Second Edition. (2004). Retrieved March 1, 2019, from http://ectacenter.org/~pdfs/eco/Carolina_preschool_crosswalk_12-13-06.pdf
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Co-funded by the
Erasmus+ Programme
of the European Union

Motor Assessment Instruments

Early Intervention

Motor Assessment Instruments

Early Intervention

- All instruments **should be used with parental support:**
  - explaining their relevance.
  - reason for their implementation.

- When parents **main concerns are related with the motor function impairments or development delays,** we can use several instruments developed and available for assessing gross motor skills.

Andrada, M.G.(2004). A criança com problemas de desenvolvimento – Falar com a família. Programa “Ser Criança – Projeto Promover”; Lisboa: APPC – Direcção Nacional – ICFI.

American Physical Therapy Association
List of Pediatric Assessment Tools Categorized by ICF Model

ACADEMY OF PEDIATRIC PHYSICAL THERAPY

Source: Academy of Pediatric Physical Therapy Fact Sheets and Resources - Academy of Pediatric Physical Therapy, APTA
https://pediatricapta.org/includes/fact-sheets/pdfs/13%20Assessment&screening%20tools.pdf

Motor Assessment Instruments in EI (0-3 years)

- **Alberta Infant Motor Scale (AIMS)**
  - Instrument for pre-term and full-term infants aged 0-18 months. Assesses the quality of movement in motor development.
  - Piper, M. C. & Darrah, J. (1994). *Motor assessment of the developing infant*. Philadelphia: WB Saunders Company.

- **Gross Motor Function Measures (GMFM-88 and GMFM-66)**
  - Instrument for children with cerebral palsy, aged between 5 months to 16 years. Assesses gross motor function.
  - Russell, D. J., Rosenbaum, P. L., Wright, M., & Avery, L. M. (2013). Gross Motor Function Measure (2nd edition). London: MacKeith Press.

- **Gross Motor Performance Measure (GMPM)**
  - Instrument to measure gross motor performance in cerebral palsy. Useful to evaluate change, over time, in the quality of a child's motor behavior. The term “gross motor performance” describes the quality of motor activities, or how well the child does the activity, for example, the degree of stability when standing.
  - Boyce, W., Gowland, C., Rosenbaum, P., Lane, M., Plews, N., Goldsmith, C., Russell, D., Wright, V., Zdrobov, S., & Harding, D. (1995). The Gross Motor Performance Measure: Validity and responsiveness of a measure of quality of movement. Physical Therapy, 75, 603-613.
  - Canchild. Developing and Validating the GMPM. Retrieved November 15, 2019 from https://www.canchild.ca/en/resources/185-developing-and-validating-the-gmpm

Motor Assessment Instruments in EI (0-3 years)

- **Test of Infant Motor Performance (TIMP)**
  - Is a test of functional motor behavior in infants used by health professionals in special care nurseries and early intervention or diagnostic follow-up settings.
  - Assesses postural and selective control of movement infants between the ages of 34 weeks postconceptional age and 4 months post-term. Identify infants that are high risk for poor motor performance and is also able to show change in motor performance over time.
  - TheTimp. Infant Motor Performance Scales. Retrieved November 15, 2019 from https://www.thetimp.com/

- **Peabody Development Motor Scales, 2nd edition**
  - Instrument to assess motor skills in children from birth to 5 years old: gross motor, fine motor, total motor and compare to normative values.
  - Folio, M.R. & Fewell, R.R. (2000). Peabody Developmental Motor Scales (PDMS-2) (2nd Edition). Pearson.

- **Early clinical assessment of balance**
  - Instrument to quantify deficits in balance that may be present in specific pediatric populations, namely Cerebral Palsy. Research studies have evaluated the validity of this outcome measure in children between the ages of 1.5 and 5 years old.
  - McCoy, S. W., Bartlett, D. J., Yocum, A., Jeffries, L., Fiss, A. L., Chiarello, L., & Palisano, R. J. (2014). Development and validity of the early clinical assessment of balance for young children with cerebral palsy. *Developmental Neurorehabilitation*, *17*(6), 375–383.

Motor Assessment Instruments in EI (0-3 years)

- These instruments are suggested for this module:
  - Alberta Infant Motor Scale (AIMS)
  - Gross Motor Function Measures (GMFM-88 and GMFM-66)

- AIMS and GMFM have been used **in motor development research studies**:
  - Provide a quantitative score;
  - Easily to be perceived for parents about the child's motor skills;
  - Could help to define goals with parents;
  - Could guide intervention.

Almeida, K. M., Dutra, M. V. P., Mello, R. R. , De Reis, A. B. R. , & Martins, P. S. (2008). Concurrent validity and reliability of the Alberta Infant Motor Scale in premature infants. *Jornal de Pediatria, 84(5),* 442–448.

Blanchard, Y., Neilan, E., Busanich, J., Garavuso, L., & Klimas, D. (2004). Interrater reliability of early intervention providers scoring the Alberta infant motor scale. *Pediatric Physical Therapy,* 16(1), 13–18.

Darrah, J., Bartlett, D., Maguire, T., Avison, W., & Lacaze-Masmonteil, T. (2014). Have infant gross motor abilities changed in 20 years? A re-evaluation of the Alberta Infant Motor Scale normative values.*Dev Med Child Neurol*,56(9),877-81.

Palisano, R., Hanna, S., Rosenbaum, P., Russell, D., Walter, S., Wood, E., & Galuppi, B. (2000). Validation of a model of Gross Motor Function for children with cerebral palsy. *Physical Therapy,* 80(10), 974-985.

Russell, D., Palisano, R., Walter, S., Rosenbaum, P., Gemus, M., Gowland, C., & Lane, M. (1998). Evaluating motor function in children with Down syndrome: validity of the GMFM. *Developmental Medicine & Child Neurology,* 40, 693-701.

Russell, D., Avery, L., Rosenbaum, P., Raina, P., Walter, S., & Palisano, R. (2000). Improved scaling of the Gross Motor Function Measure for children with cerebral palsy: evidence of reliability and validity. *Physical Therapy,* 80(9), 873- 885

Alberta Infant Motor Scale (AIMS)

Title, Edition, Dates of Publication	Motor Assessment of the Developing Infant. Philadelphia, PA: Saunders; 1994.
Authors	Martha Piper and Johanna Darrah
Costs	Motor Assessment of the Developing Infant is $95; Pack for 50 score sheets is $48.95. (http://store.elsevier.com/)
Age Range	Pre-term and full-term infants aged 0-18 months.
Type of test	Discriminative, evaluative and observational test.
Purpose	1. Identification of motor development delays (all children). The AIMS is also important in helping to identify "at risk" populations based on a variety of diagnoses. 2. Assessment and monitoring, over timer, the motor development (all children except for those with pathological changes of movement/atypical patterns).
Domain	Gross motor skills. Quality of movement in motor development.

De Albuquerque, P. L., Lemos, A., Guerra, M.Q., & Eickmann, S. H. (2015). Accuracy of the Alberta Infant Motor Scale (AIMS) to detect developmental delay of gross motor skills in preterm infants: A systematic review. D*evelopmental Neurorehabilitation*;, 18(1), 15–21.

Piper, M. C. & Darrah, J. (1994). *Motor assessment of the developing infant*. Philadelphia: WB Saunders Company.

Alberta Infant Motor Scale

History	• AIMS was validated in a study of 2202 Canadian children. The scale has been identified as an alternative for assessing gross motor development in routine health services, because it is cheap, easily reproducible, quickly implemented, and does not require much handling of the child. • AIMS used as reference the first edition of the Bayley Scales of Infant Development and the Peabody Developmental Motor Scales.
Scoring and Statistical Information	a) AIMS contains 58 items and is organized in 4 positions: **Prone** (21 items); **Supine** (9 items); **Sitting** (12 items) and **Standing** (16 items). In each item is analyzed **weight support, postural alignment and anti-gravity movement**. b) The child should only be tested on the items most appropriate to his developmental phase. During the assessment, the examiner should use toys to encourage and motivate the infant to move and explore the environment, in order to observe and to record each item as **"observed" or "not observed".** c) For each of the 4 positions, the examiner identifies the **less mature item "observed"** and the **most mature item "observed."** The items between these two poles represent the child's motor skills in that position, often designated as child's current **"window" of skills.**

De Albuquerque, P. L., Lemos, A., Guerra, M.Q., & Eickmann, S. H. (2015). Accuracy of the Alberta Infant Motor Scale (AIMS) to detect developmental delay of gross motor skills in preterm infants: A systematic review. D*evelopmental Neurorehabilitation*;, 18(1), 15–21.

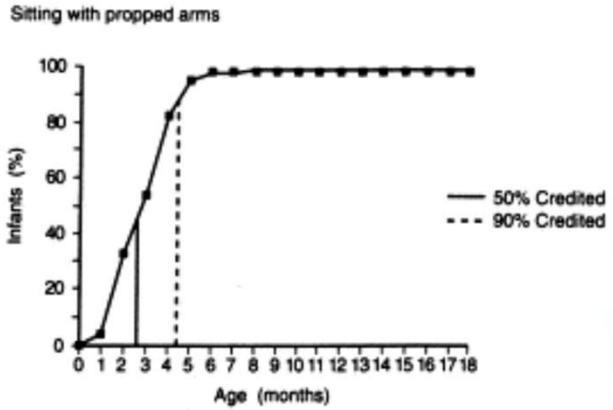
Piper, M. C. & Darrah, J. (1994). *Motor assessment of the developing infant*. Philadelphia: WB Saunders Company.

Example of an item

All items have an image, graph, and a description

Sitting with Propped Arms	
Weight Bearing	Weight on buttocks, legs, and hands
Posture	Head up; shoulders elevated Hips flexed, externally rotated, and abducted Knees flexed Lumbar and thoracic spine rounded
Antigravity Movement	Maintains head in midline Supports weight on arms briefly

Prompt: Examiner places the infant in sitting position. To pass this item, the infant must maintain the position independently without the examiner's support.



Piper, M. C. & Darrah, J. (1994). *Motor assessment of the developing infant*. Philadelphia: WB Saunders Company.

Example of "Window" of Skills

5 months old baby
Assessing Prone Position = 21 items

Observed (O) = 1 point
Not Observed (NO) = 0 points

1. Prone Lying (1)
2. Prone Lying (2)
3. Prone Propped

Items that have already been acquired
(1 point for each one)

Previous items credit = 3

"Window" of Skills

Less mature item observed

4. Forearm Support (1) — O
5. Prone Mobility — O
6. Forearm Support (2) — NO
7. Extended Arm Support — NO

Most mature item observed

8. Rolling Prone to Supine without Rotation — O
9. Swimming — NO
(…) — NO

Items credit in window = 3

Prone Subscale Score = 6

Adaptaded from Piper, M. C. & Darrah, J. (1994). *Motor assessment of the developing infant*. Philadelphia: WB Saunders Company.

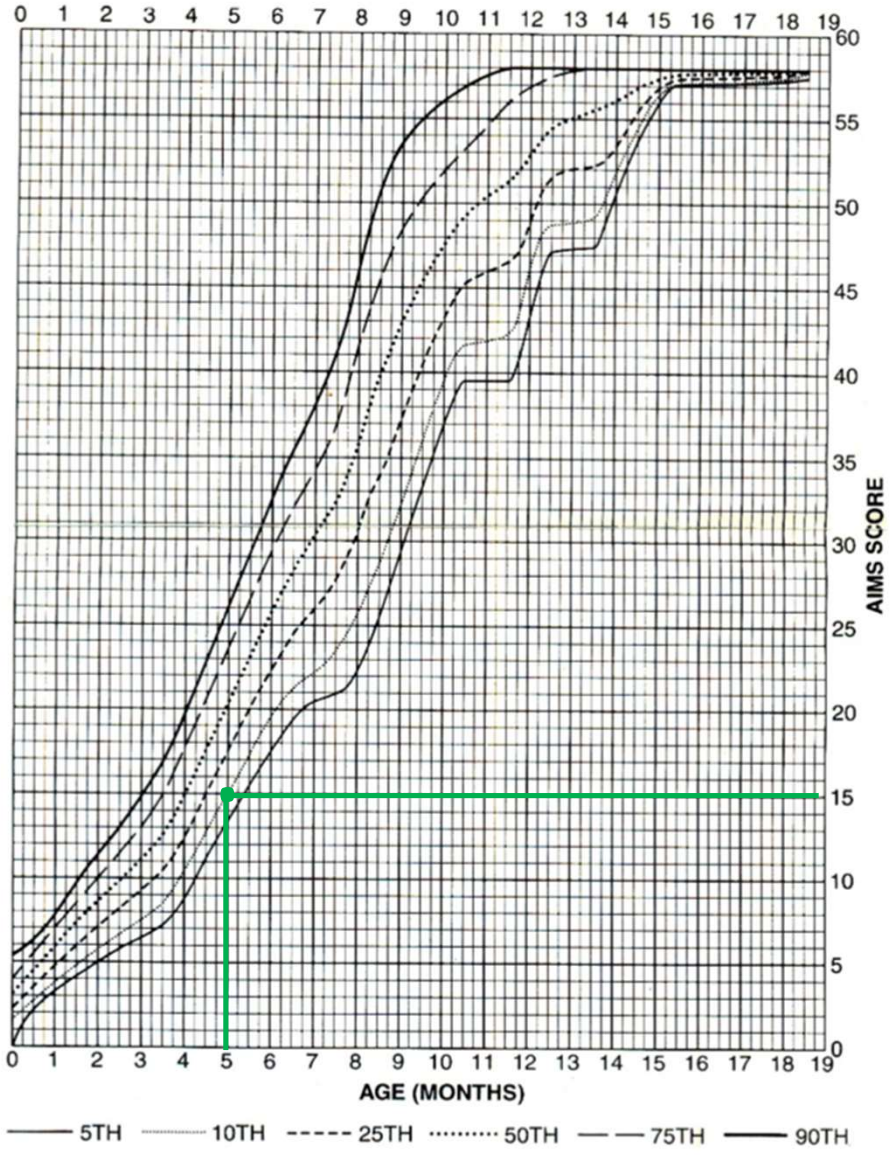
"Window" of Skills
Scoring example

	Previous items credit	Items credit in window	Subscale score
Prone	3	3	6
Supine	3	2	5
Sitting	0	2	2
Standing	1	1	2
			Total Score: 15

- The total score, of the record sheet, compares the results of AIMS with results collected in a representative sample of children of the same age with typical development.
- At the end, in the **ranking percentile chart**, the interception of child's age with the score obtained in the record sheet, determines the development curve.

Piper, M. C. & Darrah, J. (1994). *Motor assessment of the developing infant*. Philadelphia: WB Saunders Company.

Ranking Percentile



Example:

-The point on the graph represents a 5-month-old baby with a score of 15 on the AIMS scale.

- This child is in the 10th development percentile.

Piper, M. C. & Darrah, J. (1994). *Motor assessment of the developing infant*. Philadelphia: WB Saunders Company.

Alberta Infant Motor Scale

Administration	a) **Who administers:** Applied by any health professional who has training in the area of child motor development. Examiner should not intervene directly in spontaneous movement. a) **How long to administer:** Approximately 20-30 minutes. Parents should be present during the assessment and should undress the infant. It is important a quiet environment and a pleasant temperature. The child should be awake and active during the assessment. a) **How much training is required:** The health professional must understand the movement components described in each item of AIMS. To receive credit for each item (1point), the child must demonstrate all key descriptions listed on the record sheet (weight support, postural alignment and anti-gravity movement). a) **What kinds of support materials are available:** Specific guidelines are available in the AIMS manual. Use toys to encourage movement, a wooden bench or chair to observe some of the pull to stand, standing, and cruising items in the standing position.

Piper, M. C. & Darrah, J. (1994). *Motor assessment of the developing infant*. Philadelphia: WB Saunders Company.

Alberta Infant Motor Scale

To consider…

- AIMS it is not a standardized tool for every population. Development and percentiles vary across cultures.
- Important instrument to identify babies at risk.
- Good instrument to monitor and to understand, over time, motor development in the first year and a half of life.
- Does not assess, children with atypical patterns of movement. It only helps to identify children with atypical development.
- Does not require too much handling of the professional but uses a specific technical language.
- Assesses the quality of movement, being very specific and clear in that matter (weight support, postural alignment, and antigravity movement)
- The assessment provides a quantitative score.
- It is a very visual instrument, therefor easy to be understood by parents. However, they may need support to understand all the components of the instrument (image, graph, and description of each item).

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- De Albuquerque, P. L., Lemos, A., Guerra, M.Q., & Eickmann, S. H. (2015). Accuracy of the Alberta Infant Motor Scale (AIMS) to detect developmental delay of gross motor skills in preterm infants: A systematic review. D*evelopmental Neurorehabilitation*;, 18(1), 15–21.
- Piper, M. C. & Darrah, J. (1994). *Motor assessment of the developing infant*. Philadelphia: WB Saunders Company.

Gross Motor Function Measure (GMFM-88 and GMFM-66)

Title, Edition, Dates of Publication	Gross Motor Function Measure (GMFM-66 & GMFM-88) User's manual 2nd Edition December, 2013
Authors	Dianne J. Russell, Peter L. Rosenbaum, Lisa M. Avery, Mary Lane
Costs	•$119 for User's Manual, 2nd Edition through Wiley Blackwell Publishing. •The GMFM score sheets are freely available for personal and non-commercial use. •The Gross Motor Ability Estimator (GMAE-2) Scoring Software can be downloaded from the *CanChild* website (https://www.canchild.ca/).
Age Range	Children with cerebral palsy (CP) aged between 5 months to 16 years.
Type of test	Observational test. GMFM is a standardized, valid, reliable, and responsive tool designed to evaluate changes in gross motor function in children with CP.
Domain	Gross Motor Function.
History	It was first developed in the late 1980's for use in both clinical and research settings and has evolved through advanced analytic techniques in response to requests for more efficient testing. GMFM 88 & 66 has been translated into Dutch, Portuguese, Norwegian, korean and Spanish.

Russell, D. J., Rosenbaum, P. L., Wright, M., & Avery, L. M. (2013). Gross Motor Function Measure (2nd edition). London: MacKeith Press.

CanChild. The The Gross Motor Function Measure (GMFM). Retrieved June 30, 2019 from https://canchild.ca/en/resources/44-gross-motor-function-measure-gmfm

Gross Motor Function Measure (GMFM-88 and GMFM-66)

Purpose	a) **Target Group:** GMFM has become the best evaluative measure of motor function designed for quantifying change in the gross motor abilities of children with CP. It has also been validated for Down syndrome. b) **Purpose:** GMFM aims to measure gross motor function, to help define goals, to record changes over time, to give information to caregivers of the rehabilitation process, and to enable the development of scientific research studies. The choice of which GMFM version (88 or 66) to use depends on the purpose of the assessment and the type of population. • The **GMFM-88** provides a more descriptive information about motor function for very young children or children with more complex motor disability, such as those functioning in Gross Motor Function Classification System (GMFCS) level V, as it has more items that describe early motor skills. This version is also used to evaluate children with syndromes and other motor disorders. • The **GMFM-66** is a 66 items subset of the original 88 items, identified through *Rasch* analysis to best describe the gross motor function. This version has only been validated for children with CP and takes less time since there are fewer items to evaluate. GMFM-66 uses to score a software with many advantages, since it is possible to record the changes occurred in a succession of evaluations, and show them in the form of a frame, making it easier to observe.

Avery, L., Russell, D., Raina, P., Walter, S., & Rosenbaum, P. (2003). Rasch Analysis of the Gross Motor Function Measure: validating the assumptions of the Rasch Model to create an interval-level measure. *Archives of Physical Medicine Rehabilitation*, 84, 697-705.

Palisano, R., Hanna, S., Rosenbaum, P., Russell, D., Walter, S., Wood, E., & Galuppi, B. (2000). Validation of a model of Gross Motor Function for children with cerebral palsy. *Physical Therapy,* 80(10), 974-985.

Russell, D., Palisano, R., Walter, S., Rosenbaum, P., Gemus, M., Gowland, C., & Lane, M. (1998). Evaluating motor function in children with Down syndrome: validity of the GMFM. *Developmental Medicine & Child Neurology,* 40, 693-701.

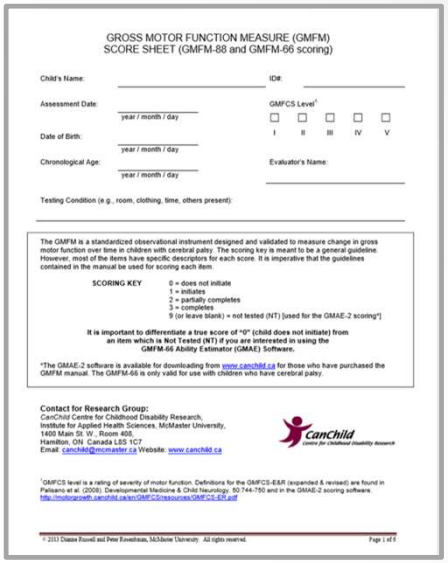
Russell, D., Avery, L., Rosenbaum, P., Raina, P., Walter, S., & Palisano, R. (2000). Improved scaling of the Gross Motor Function Measure for children with cerebral palsy: evidence of reliability and validity. *Physical Therapy,* 80(9), 873- 885

Gross Motor Function Measure (GMFM-88 and GMFM-66)

Scoring and Statistical Information

- The test assesses 5 gross motor dimensions:
  A) lying and rolling
  B) sitting
  C) crawling and kneeling
  D) standing
  E) walking, running and jumping.

- There is a 4-point scoring system for each item:
  0 - Does not initiate task
  1 - Initiates task
  2 - Partially completes task
  3 - Completes task



GROSS MOTOR FUNCTION MEASURE (GMFM)
SCORE SHEET (GMFM-88 and GMFM-66 scoring)

Child's Name: ID#:

Assessment Date: year / month / day

GMFCS Level[1]: I II III IV V

Date of Birth: year / month / day

Chronological Age: year / month / day

Evaluator's Name:

Testing Condition (e.g., room, clothing, time, others present):

The GMFM is a standardized observational instrument designed and validated to measure change in gross motor function over time in children with cerebral palsy. The scoring key is meant to be a general guideline. However, most of the items have specific descriptors for each score. It is imperative that the guidelines contained in the manual be used for scoring each item.

SCORING KEY
0 = does not initiate
1 = initiates
2 = partially completes
3 = completes
9 (or leave blank) = not tested (NT) [used for the GMAE-2 scoring*]

It is important to differentiate a true score of "0" (child does not initiate) from an item which is Not Tested (NT) if you are interested in using the GMFM-66 Ability Estimator (GMAE) Software.

*The GMAE-2 software is available for downloading from www.canchild.ca for those who have purchased the GMFM manual. The GMFM-66 is only valid for use with children who have cerebral palsy.

Contact for Research Group:
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CanChild
Centre for Childhood Disability Research

[1]GMFCS level is a rating of severity of motor function. Definitions for the GMFCS-E&R (expanded & revised) are found in Palisano et al. (2008). Developmental Medicine & Child Neurology, 50:744-750 and in the GMAE-2 scoring software. http://motorgrowth.canchild.ca/en/GMFCS/resources/GMFCS-ER.pdf

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- For accurate and reliable tests, it is important to use the manual's descriptors for each scoring item.
- Note that a child with typical development and with 5 years old should get 100% on GMFM.

Russell, D. J., Rosenbaum, P. L., Wright, M., & Avery, L. M. (2013). Gross Motor Function Measure (2nd edition). London: MacKeith Press.

CanChild. The The Gross Motor Function Measure (GMFM). Retrieved June 30, 2019, from https://canchild.ca/en/resources/44-gross-motor-function-measure-gmfm

Gross Motor Function Measure (GMFM-88 and GMFM-66)

Scoring and Statistical Information	• The **GMFM-88** provides a percentual score. Items scored, for each of the five dimensions, are summed and a percentual score is determined. Finally, a total score is calculated through an average.
	• The **GMFM-66** provides an interval scaling and it gives information on the level of difficulty of each item. Items scored are entered and a mathematical algorithm calculates an interval level total score.
	• In order to decrease the number of items to be tested, two reduced versions of GMFM-66 were created, through *Rash* analysis:
	  ◦ **GMFM-66-Item Sets** (GMFM-66-IS): uses a scoring algorithm to identify a subset of items to administer, according to the GMFCS.
	  ◦ **GMFM-66 Basal & Ceiling** (GMFM-66-B&C): uses a basal and ceiling approach to identify a subset of items. It must assess at least 15 items.
	  ◦ These two new versions only test items relevant to the child's current ability. Both versions are valid, making motor function assessment less time consuming and a more frequently used instrument. The results obtained in the study of Brutton & Bartlett (2011) showed that both versions were highly in agreement with each other.
	• **GMAE-2** calculates scores for the GMFM-88, GMFM-66, GMFM-66-IS and GMFM-66-B&C.

Avery, L., Russell, D., & Rosenbaum, P. (2013). Criterion validity of the GMFM-66 item set and the GMFM-66 basal and ceiling approaches for estimating GMFM-66 scores. Developmental Medicine & Child Neurology, 55, 534-538.

Brunton, L. K., Bartlett, D. J. (2011). Validity and Reliability of Two Abbreviated Versions of the Gross Motor Function Measure. Physical Therapy 91: 577-588.

Russell, D. J., Avery, L. M., Walter, S. D., Hanna, S. E., Bartlett, D. J., Rosenbaum, P. L., … Gorter, J. W. (2010). Development and validation of item sets to improve efficiency of administration of the 66-item Gross Motor Function Measure in children with cerebral palsy. Developmental Medicine & Child Neurology, 52(2), e48–e54.

Gross Motor Ability Estimator (GMAE-2)Scoring Software for the GMFM

- The GMAE-2 is a software package for scoring the GMFM. It provides an interval-level measure of gross motor function based on a child's score on the items of the GMFM.
- The GMAE was calibrated on a sample of children with Cerebral Palsy. It is valid only for this population and should not be used with other diagnoses.

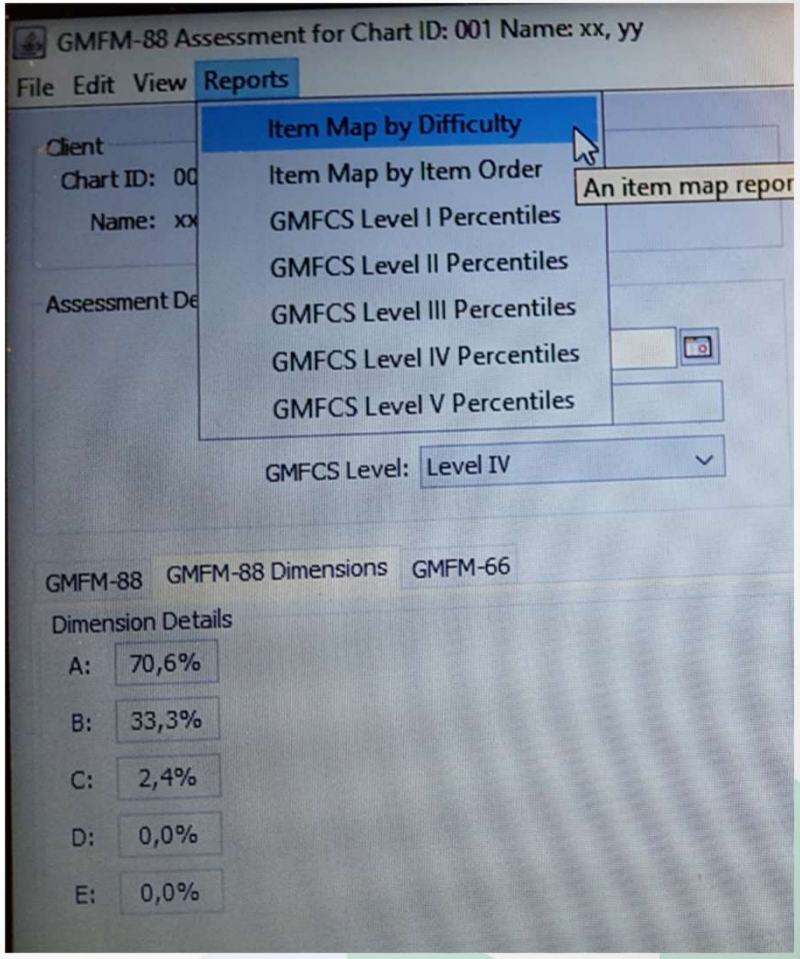
- In this software it is necessary to:
  - Fill the child’s age
  - Fill the child’s GMFCS level
  - Score all the items according with 4-point scoring system on GMFM (0,1,2 or 3)

CanChild. Gross Motor Ability Estimator (GMAE-2) Scoring Software for the GMFM. Retrieved November 15, 2019, from https://www.canchild.ca/en/resources/191-gross-motor-ability-estimator-gmae-2-scoring-software-for-the-gmfm

Russell, D., Leung, K., & Rosenbaum, P. (2003). Accessibility and perceived clinical utility of the GMFM-66: evaluating Therapists' judgements of a computer-based scoring program. *Physical & Occupational Therapy in Pediatrics*, 23(2), 45-58.

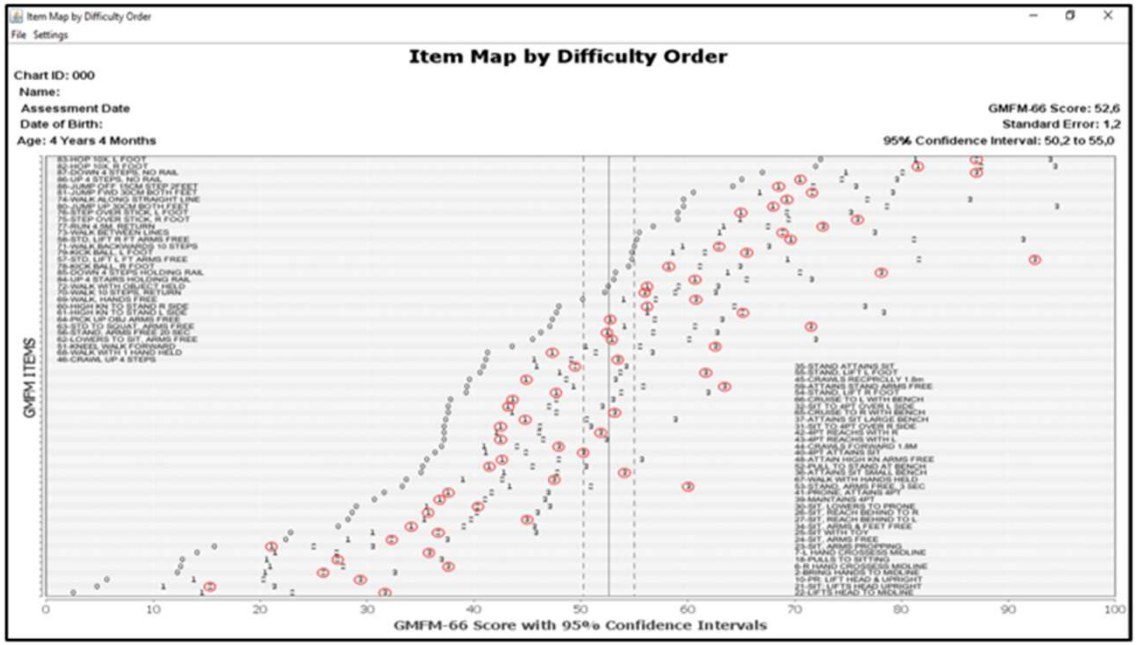
GMAE-2 Scoring Software
Reports

- After scoring all the items, it is possible to obtain the reports in different views:
  - Item map by difficulty order
  - Item map by item ordem
  - GMFCS Percentiles

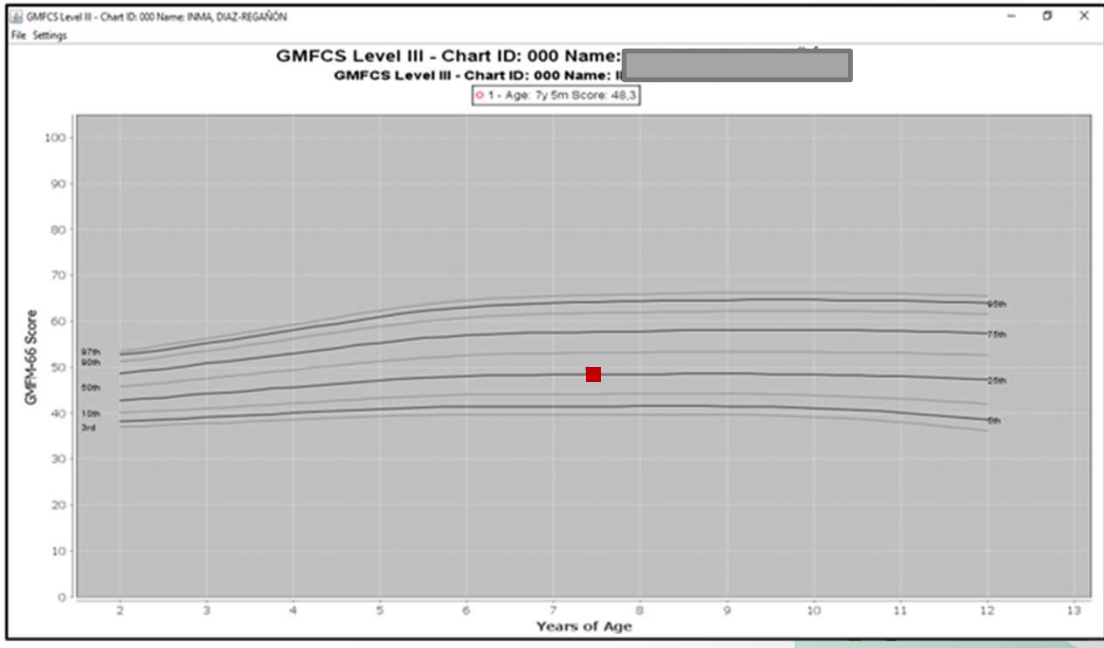


GMAE-2 Scoring Software
Example of Reports

Item Map by Difficulty Order



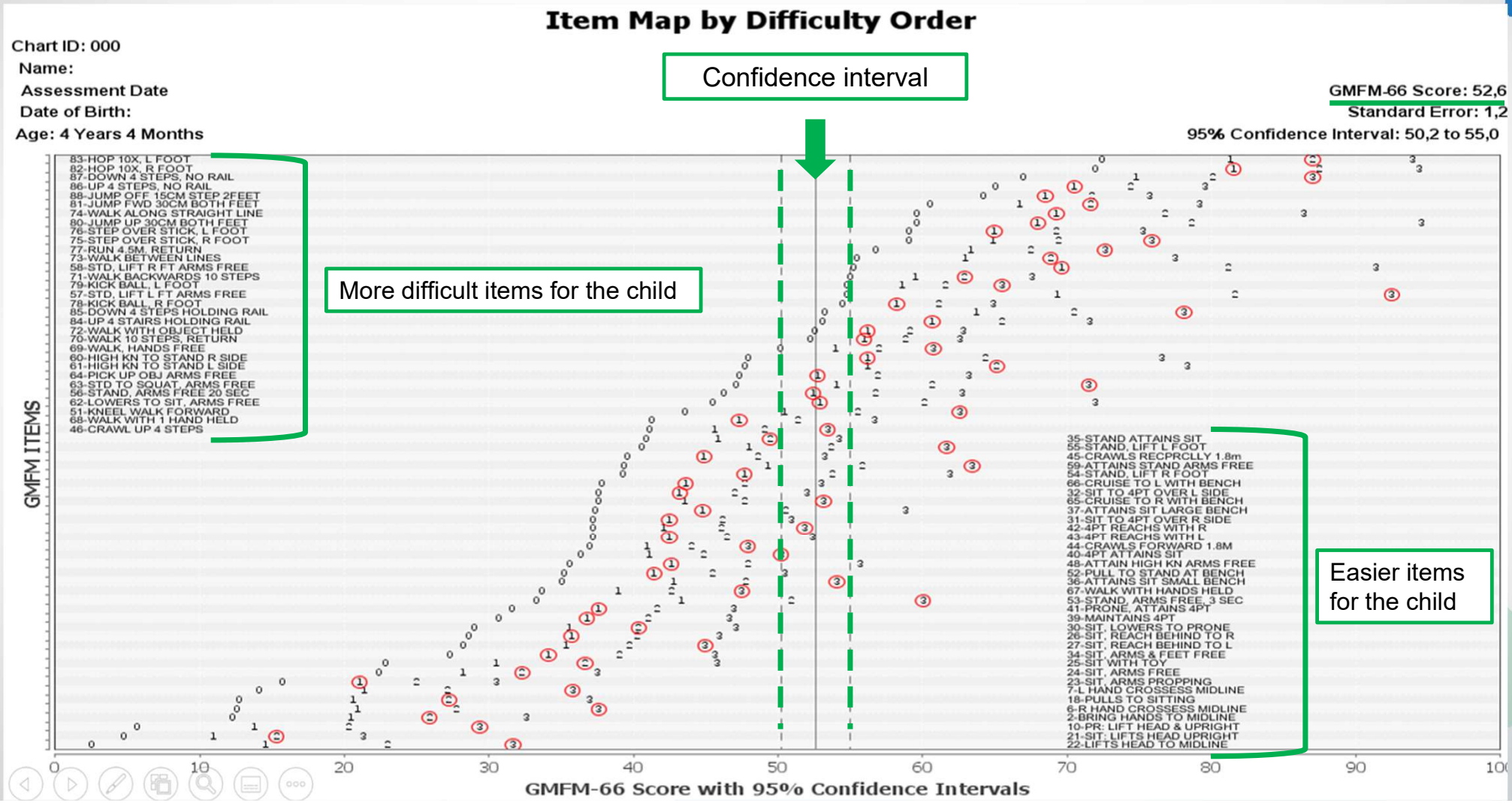
GMFCS Level III Percentiles



In the map all the scored items are marked with a red circle

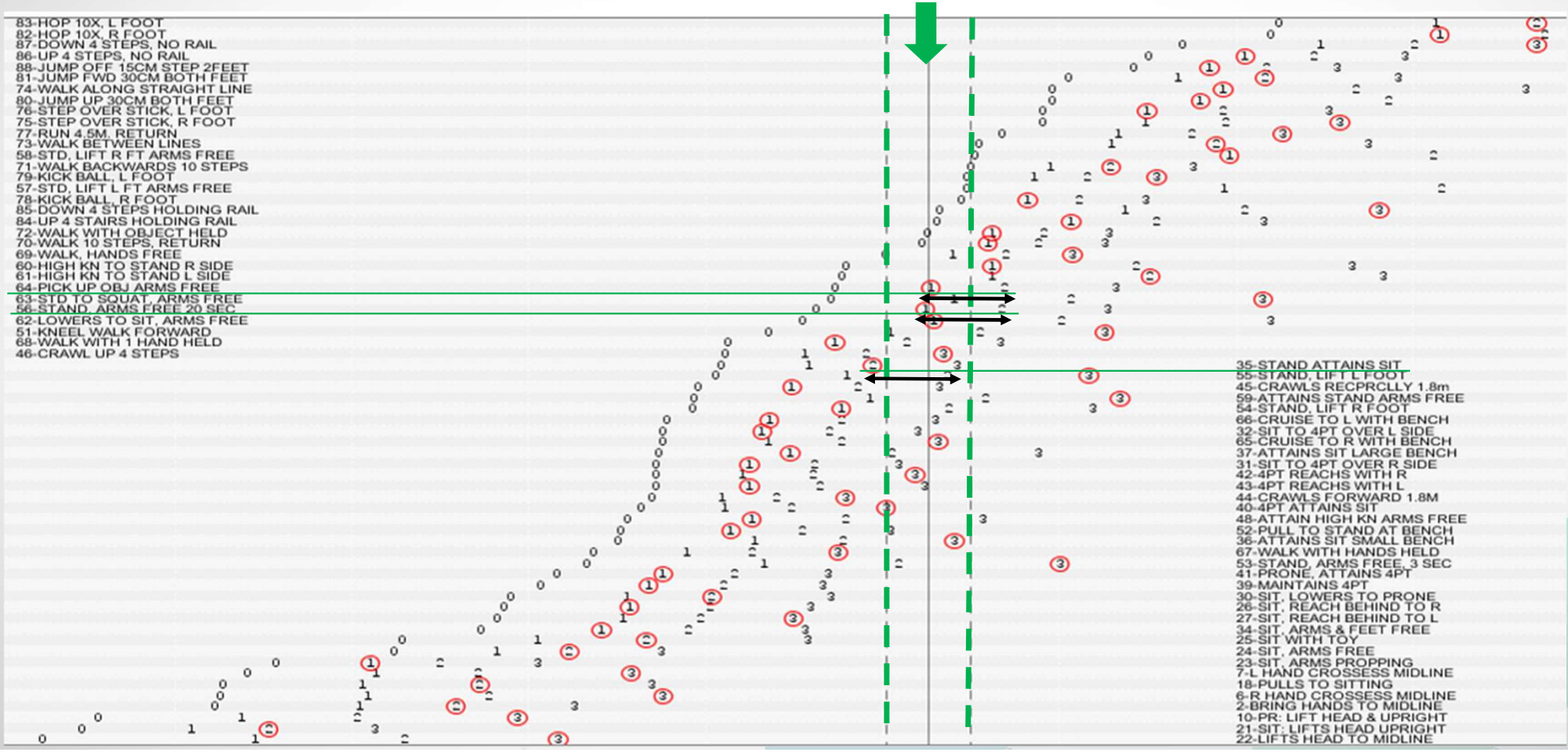
25 th percentile

GMAE-2 Example of Reports



GMAE-2 could help to define goals

In the confidence interval, we can find the items with the **shortest distance between the scored item and the next scoring level. These items are important guides for the intervention planning, giving clues about the emerging competences of the child.**



GMAE-2 Scoring Software
Example

- According with GMAE-2 scoring software, 3 possible and realistic goals to define with parents could be:
  - GMFM Item 35. Standing: attains sit on small bench
  - GMFM Item 56. Standing: maintains, arms free, 20 seconds
  - GMFM Item 64. Standing: picks up objects from floor, arms free, returns to stand

Gross Motor Function Measure (GMFM-88 and GMFM-66)

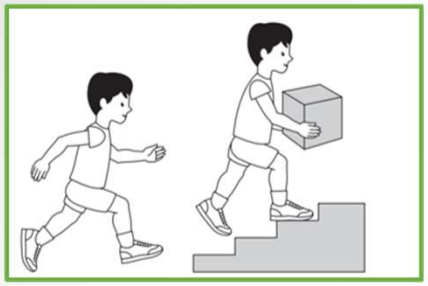
Administration	a) **Who administers:** The GMFM was designed for use by pediatric therapists who are familiar with assessing motor skills in children with CP. It should be administered in a comfortable environment for the child and large enough to allow children to move freely. Parents should be present. a) **How long to administer:** GMFM-88 takes approximately 45 to 60 minutes for someone familiar with the measure. Time will vary depending on the ability level of the child and the child's level of cooperation and understanding. The GMFM-66 should take less time to administer as there are fewer items and allows for not-tested items. a) **How much training is required:** Users should be familiarized with the GMFM administration, scoring guidelines and the score sheets prior to assessing children. It is recommended that users assess their reliability with other therapists familiar with the measure. a) **What kinds of support materials are available:** Specific guidelines are available in the GMFM manual. Required equipment: toys, mat, adjustable bench, tape lines and strairs. Space with 4.5 meter is necessary for the running item. The floor should have a smooth and firm surface.

Russell, D. J., Rosenbaum, P. L., Wright, M., & Avery, L. M. (2013). Gross Motor Function Measure (2nd edition). London: MacKeith Press.

CanChild. The The Gross Motor Function Measure (GMFM). Retrieved June 30, 2019 from https://canchild.ca/en/resources/44-gross-motor-function-measure-gmfm

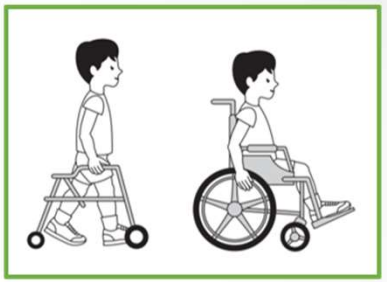
Levels of Gross Motor Function Classification System - Expanded & Revised

GMFCS Level I
Walks without Limitations



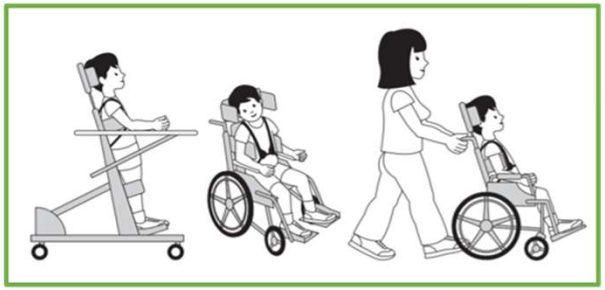
GMFCS Level II
Walks with Limitations

GMFCS Level III
Walks Using a Hand-Held Mobility Device
(walkers, crutches, or canes)



GMFCS Level IV
Self-Mobility with Limitations; May Use Powered Mobility

GMFCS Level V
Transported in a Manual Wheelchair

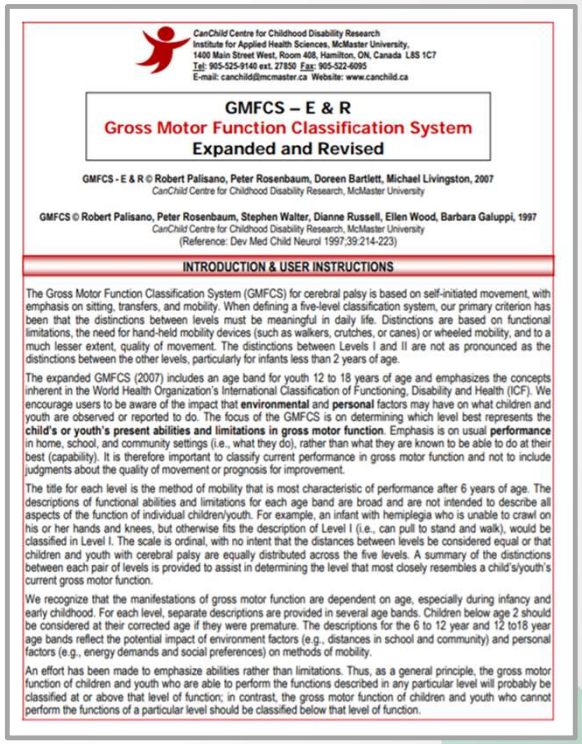


These illustrations were developed only after 6 years of age. The classification is based on self-initiated movement, with emphasis on sitting, transfers and mobility. The 5 levels differentiates **children with cerebral palsy** based on the child's current gross motor abilities, functional limitations, need for assistive technology and wheeled mobility. It can be helpful to share with parents.

CanChild. The Gross Motor Function Classification System Expanded & Revised (GMFCS E&R). Retrieved June 30, 2019, from https://www.canchild.ca/system/tenon/assets/attachments/000/002/114/original/GMFCS_English_Illustrations_V2.pdf

Gross Motor Function Classification System - Expanded & Revised

- The GMFCS - E&R contains 5 age bands:
  - under 2 years, 2-4 years, 4-6 years, 6-12 years, 12-18 years
  - it is available on CanChild in several languages.
- Gross motor function depends on age, especially during early childhood.
- This classification emphasizes what children do in their daily routine and in their natural contexts - home, school, and community.
- Recent researches indicates that GMFCS - E&R levels are quite stable after 2 years of age.



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GMFCS – E & R
Gross Motor Function Classification System
Expanded and Revised

GMFCS - E & R © Robert Palisano, Peter Rosenbaum, Doreen Bartlett, Michael Livingston, 2007
CanChild Centre for Childhood Disability Research, McMaster University

GMFCS © Robert Palisano, Peter Rosenbaum, Stephen Walter, Dianne Russell, Ellen Wood, Barbara Galuppi, 1997
CanChild Centre for Childhood Disability Research, McMaster University
(Reference: Dev Med Child Neurol 1997;39:214-223)

INTRODUCTION & USER INSTRUCTIONS

The Gross Motor Function Classification System (GMFCS) for cerebral palsy is based on self-initiated movement, with emphasis on sitting, transfers, and mobility. When defining a five-level classification system, our primary criterion has been that the distinctions between levels must be meaningful in daily life. Distinctions are based on functional limitations, the need for hand-held mobility devices (such as walkers, crutches, or canes) or wheeled mobility, and to a much lesser extent, quality of movement. The distinctions between Levels I and II are not as pronounced as the distinctions between the other levels, particularly for infants less than 2 years of age.

The expanded GMFCS (2007) includes an age band for youth 12 to 18 years of age and emphasizes the concepts inherent in the World Health Organization's International Classification of Functioning, Disability and Health (ICF). We encourage users to be aware of the impact that **environmental** and **personal** factors may have on what children and youth are observed or reported to do. The focus of the GMFCS is on determining which level best represents the **child's or youth's present abilities and limitations in gross motor function**. Emphasis is on usual **performance** in home, school, and community settings (i.e., what they do), rather than what they are known to be able to do at their best (capability). It is therefore important to classify current performance in gross motor function and not to include judgments about the quality of movement or prognosis for improvement.

The title for each level is the method of mobility that is most characteristic of performance after 6 years of age. The descriptions of functional abilities and limitations for each age band are broad and are not intended to describe all aspects of the function of individual children/youth. For example, an infant with hemiplegia who is unable to crawl on his or her hands and knees, but otherwise fits the description of Level I (i.e., can pull to stand and walk), would be classified in Level I. The scale is ordinal, with no intent that the distances between levels be considered equal or that children and youth with cerebral palsy are equally distributed across the five levels. A summary of the distinctions between each pair of levels is provided to assist in determining the level that most closely resembles a child's/youth's current gross motor function.

We recognize that the manifestations of gross motor function are dependent on age, especially during infancy and early childhood. For each level, separate descriptions are provided in several age bands. Children below age 2 should be considered at their corrected age if they were premature. The descriptions for the 6 to 12 year and 12 to18 year age bands reflect the potential impact of environment factors (e.g., distances in school and community) and personal factors (e.g., energy demands and social preferences) on methods of mobility.

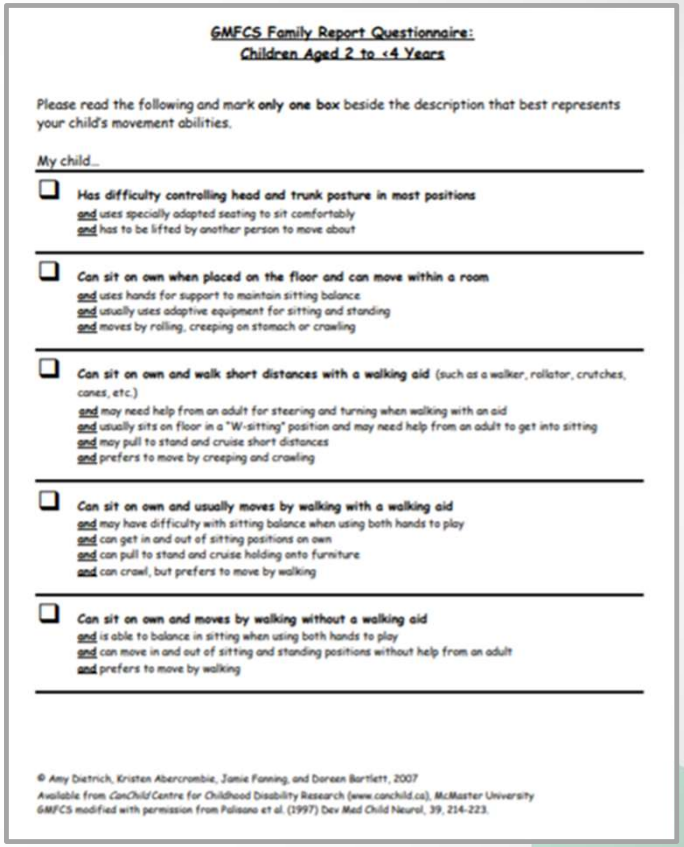
An effort has been made to emphasize abilities rather than limitations. Thus, as a general principle, the gross motor function of children and youth who are able to perform the functions described in any particular level will probably be classified at or above that level of function; in contrast, the gross motor function of children and youth who cannot perform the functions of a particular level should be classified below that level of function.

CanChild. The Gross Motor Function Classification System Expanded & Revised (GMFCS). Retrieved June 30, 2019, from https://www.canchild.ca/system/tenon/assets/attachments/000/000/058/original/GMFCS-ER_English.pdf

GMFCS Family Report Questionnaire

- GMFCS - E & R was dependent on a health professional to classify the child.

- GMFCS Family Report Questionnaire was recently developed to involve parents in the classification of children's motor skills.
- It is available for 4 age groups of children and youth:
  - 2-4 years, 4-6 years, 6-12 years and 12 to 18 years.
- It is available on CanChild in several languages.



GMFCS Family Report Questionnaire:
Children Aged 2 to <4 Years

Please read the following and mark **only one box** beside the description that best represents your child's movement abilities.

My child...

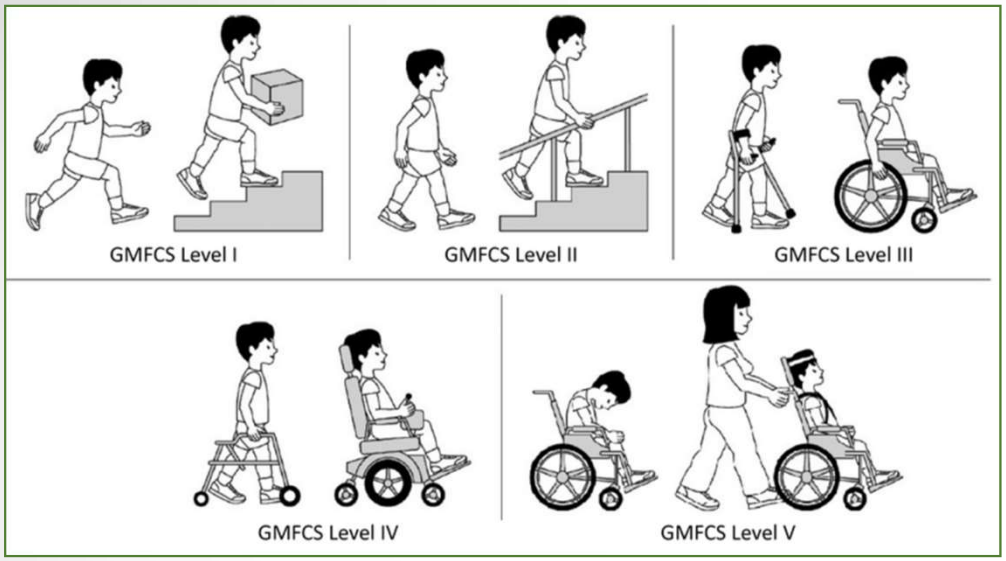
- ☐ **Has difficulty controlling head and trunk posture in most positions**
  and uses specially adapted seating to sit comfortably
  and has to be lifted by another person to move about
- ☐ **Can sit on own when placed on the floor and can move within a room**
  and uses hands for support to maintain sitting balance
  and usually uses adaptive equipment for sitting and standing
  and moves by rolling, creeping on stomach or crawling
- ☐ **Can sit on own and walk short distances with a walking aid** (such as a walker, rollator, crutches, canes, etc.)
  and may need help from an adult for steering and turning when walking with an aid
  and usually sits on floor in a "W-sitting" position and may need help from an adult to get into sitting
  and may pull to stand and cruise short distances
  and prefers to move by creeping and crawling
- ☐ **Can sit on own and usually moves by walking with a walking aid**
  and may have difficulty with sitting balance when using both hands to play
  and can get in and out of sitting positions on own
  and can pull to stand and cruise holding onto furniture
  and can crawl, but prefers to move by walking
- ☐ **Can sit on own and moves by walking without a walking aid**
  and is able to balance in sitting when using both hands to play
  and can move in and out of sitting and standing positions without help from an adult
  and prefers to move by walking

CanChild. The Gross Motor Function Classification System Expanded & Revised. Family Report Questionnaire. Retrieved June 30, 2019, from https://www.canchild.ca/system/tenon/assets/attachments/000/000/481/original/GMFCS_Family.pdf

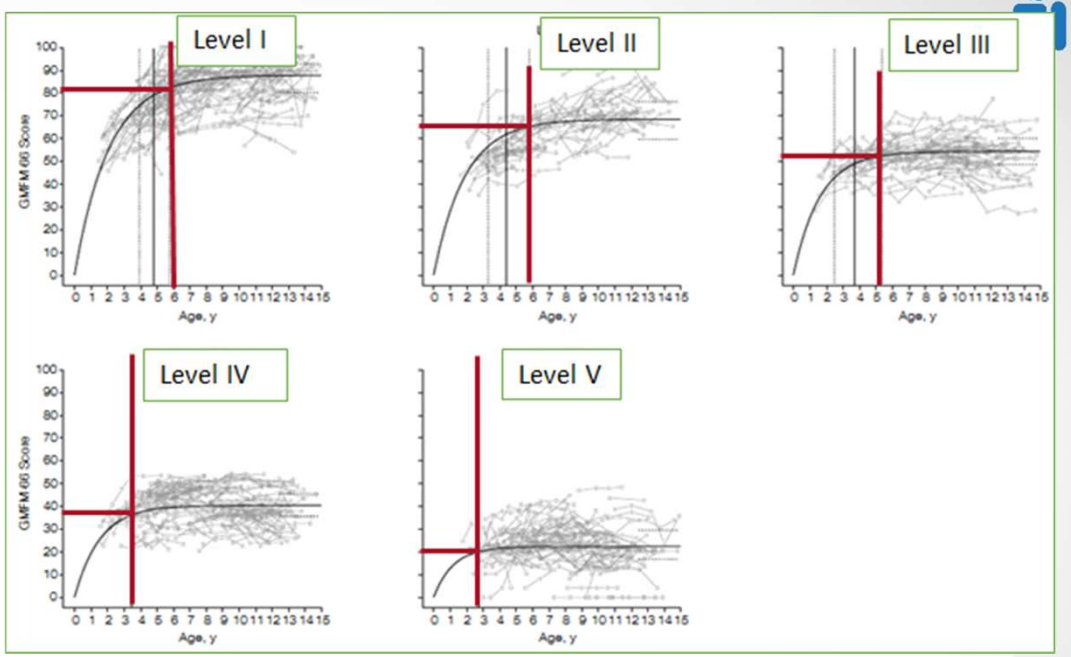
Gross Motor Function Classification System

CanChild, The Gross Motor Function Classification System Expanded & Revised (GMFCS). Retrieved June 30, 2019 from https://vimeo.com/293380093

GMFM & GMFCS & Motor Development Curves for CP



Levels of Gross Motor Function Classification System (GMFCS)
(Source: Palisano et al., 1997)



Observed and predicted GMFM-66 scores in each level of the GMFCS
(Source: Rosenbaum et al., 2002)

The graphics describes motor developmental patterns for children with CP according to the severity of the condition.

Milder cases have higher scores on the GMFM and the curves stabilize later (Level I ≈ 6 years).

Severe cases have less scores on the GMFM and the curves stabilize earlier (Level V ≈ 3 years).

Palisano, R., Rosenbaum, P., Walter, S., Russell, D., Wood, E., & Galuppi, B. (1997). Development and reliability of a system to classify gross motor function in children with cerebral palsy. *Developmental Medicine & Child Neurology,* 39, 214-223.

Palisano, R. J., Rosenbaum, P., Bartlett, D., & Livingston, M. H. (2008). Content validity of the expanded and revised Gross Motor Function Classification System. Developmental Medicine and Child Neurology, 50(10), 744–750.

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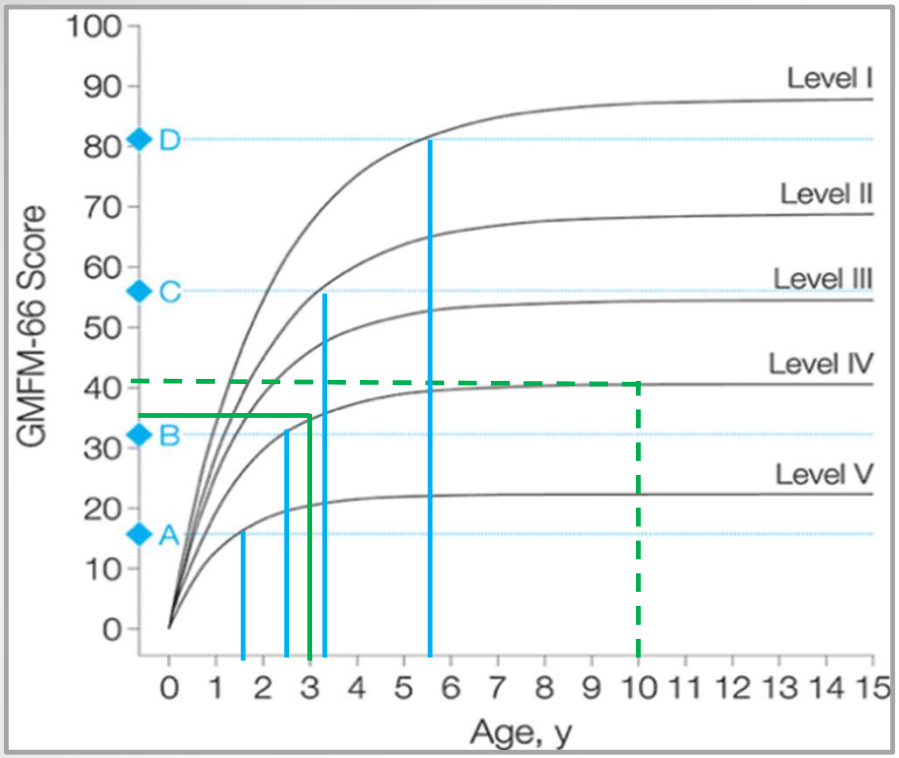
GMFM & GMFCS & Motor Development Curves for CP



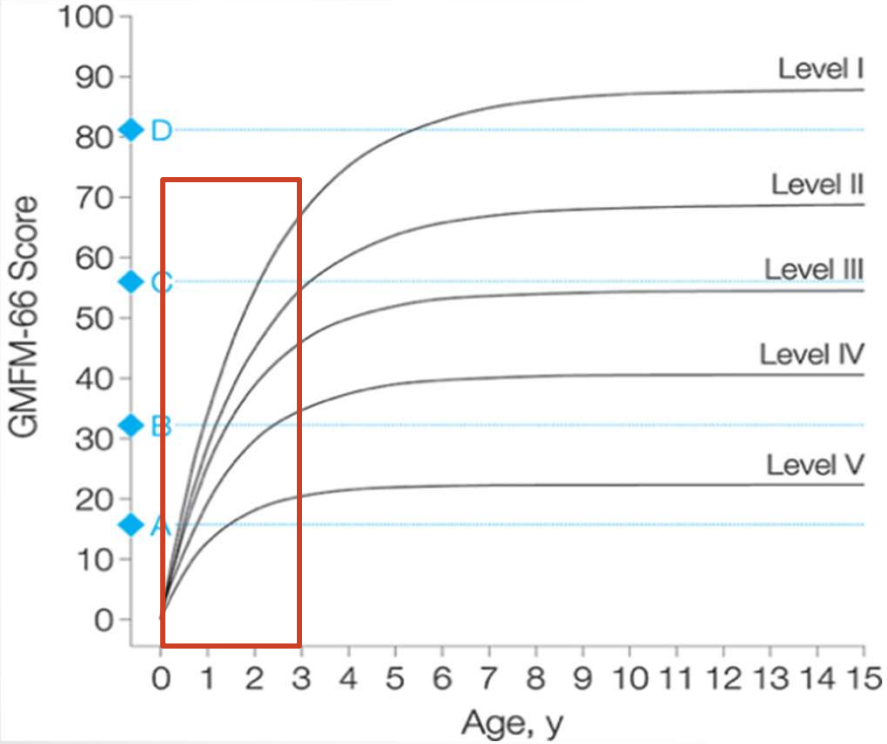
- GMFM-66 score & prognoses about child's future motor abilities. Example in the graph:
  - If a 3-year-old child gets 35% on the GMFM-66, then when this child will be 10 years old, the probability of scoring over 40% is very low.

- On the vertical axis, the diamonds identify 4 items of the GMFM-66 that predict when children are expected to have a 50% chance of completing that item successfully. (Hanna, Bartlett, Rivard & Russell, 2008).

Diamond A = GMFM-66, item 21 assesses if a child can lift and maintain the head in a vertical position, with trunk support by a therapist while sitting.
Diamond B = GMFM-66, item 24 assesses if a child can maintain a sitting position on a mat without support from his/her arms for 3 seconds.
Diamond C = GMFM-66, item 69 assesses a child's ability to walk forward 10 steps without support.
Diamond D = GMFM-66, item 87 assesses the task of walking down 4 steps by alternating feet with arms free.

Hanna S.E., Bartlett, D.J., Rivard, L.M., & Russell, D.J. (2008). Reference curves for the Gross Motor Function Measure: Percentiles for clinical description and tracking over time among children with cerebral palsy. *Physical Therapy* 88(5), 596-607.

GMFM & GMFCS & Motor Development Curves for CP



- During the **first years of child's development, the curves are exponential**, which means that it is in this period that the child and family intervention must be focused because **any gain could have major impacts in the child's future.**
- Motor development curves for CP can provide means to families and professionals to plan intervention and to measure progress.
- There is always the possibility of some evolution, but is important to **manage families and professionals' expectations.**

Hanna S.E., Bartlett, D.J., Rivard, L.M., & Russell, D.J. (2008). Reference curves for the Gross Motor Function Measure: Percentiles for clinical description and tracking over time among children with cerebral palsy. *Physical Therapy* 88(5), 596-607.

Gross Motor Function Measure (GMFM-88 and GMFM-66)

To consider…

- It is a **standardized, valid, reliable and responsive tool** design to evaluate changes in gross motor function (only for CP and Down Syndrom).
- Evaluates **all the gross motor dimensions** (lying and rolling, sitting, crawling and kneewling, standing, walking, running and jumping) **but does not evaluate the quality of movement**.
- Widespread use in research studies.
- The **GMFM-88** can be used in children with **any kind of developmental delay**, but the **GMFM-66** can only be used in children with **CP.**
- The application requires fully cooperation of the child and sometimes that is not possible.
- The manual application of the instrument can be very time consuming. The software version, **GMAE-2 can reduce the time of the application**.
- It gives parents a guidance to **understand the motor development** of the child and to **define goals.**
- With the motor development curves, for CP, it is possible to create **evidence-based developmental prognoses about child's future motor abilities.**

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Thank you for your attention