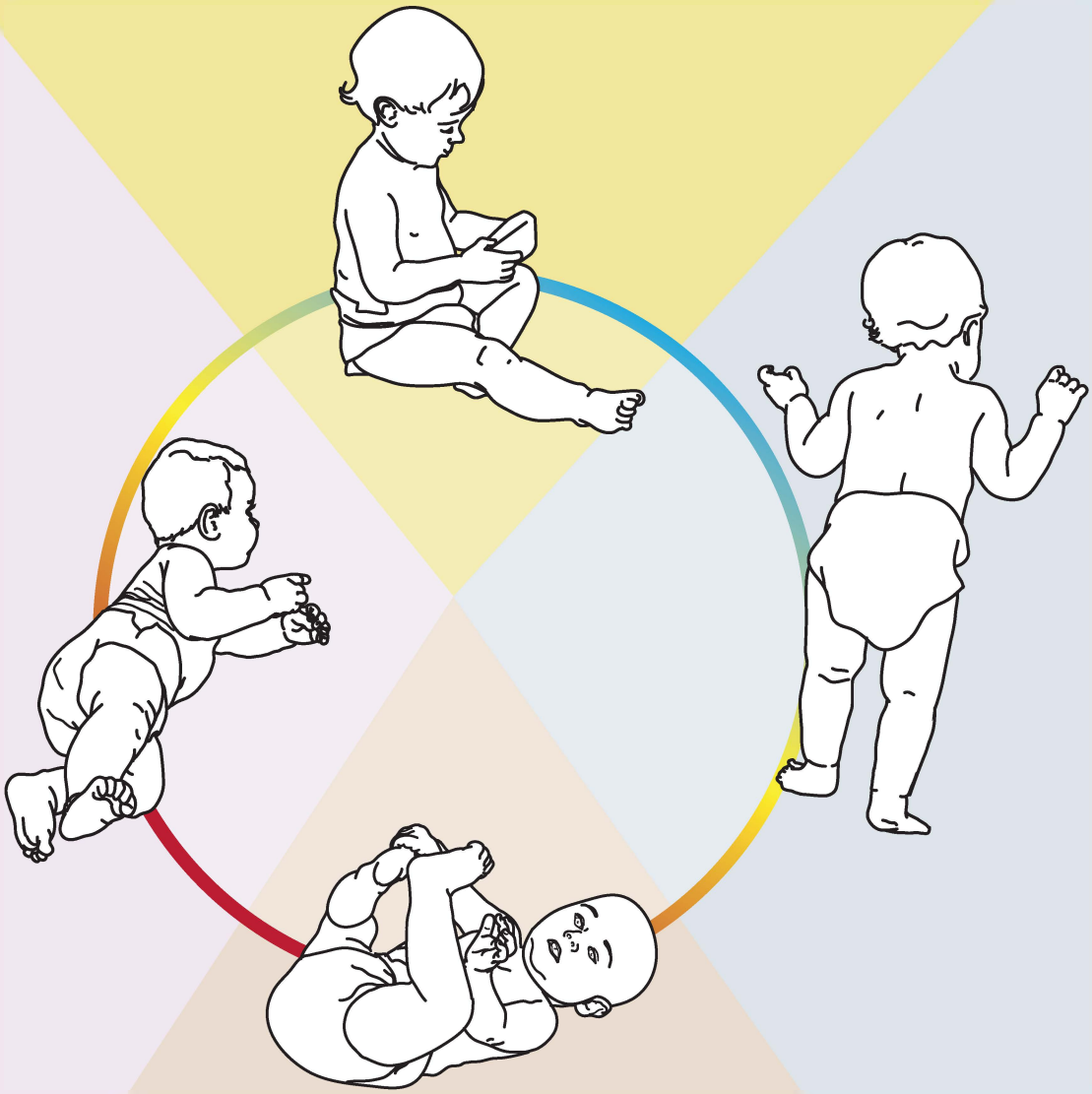
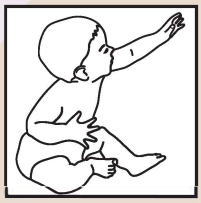
Movement Assessment of Children

A Manual

Second Edition





Lynette S. Chandler, PhD, PT

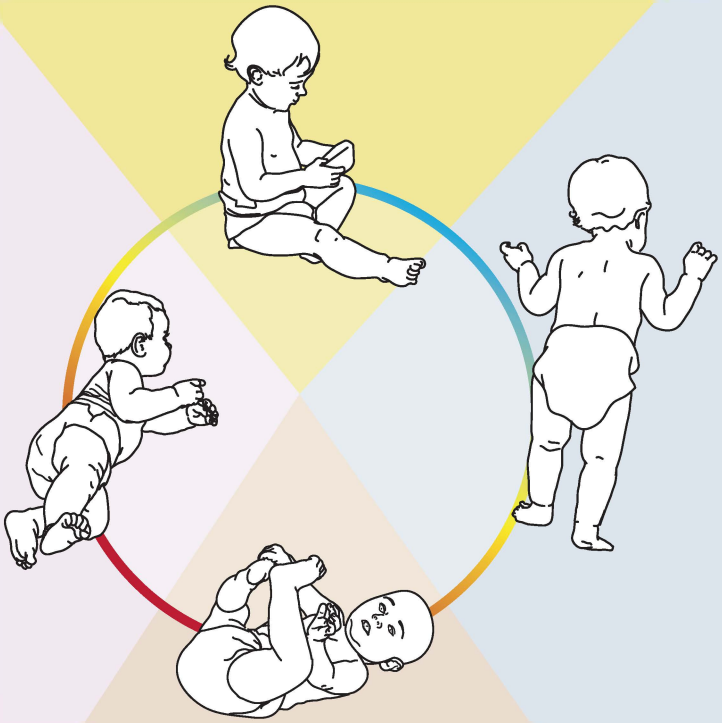
Mary Skillen Andrews, BA, PT, OT

Marcia F. Williams, PhD, MPH,PT

Movement Assessment of Children

A Manual

Second Edition



Lynette S. Chandler, PhD, PT
Mary Skillen Andrews, BA, PT, OT
Marcia F. Williams, PhD, MPH,PT

Direct questions to:
Lynette S. Chandler
e-mail: lynettemac1@mac.com

Table of Contents

Authors

Author
Lynette S. Chandler, PhD, PT

Lynette received her undergraduate degree and certificate of physical therapy at Simmons College in Boston and her MEd and PhD at the University of Washington. She has worked as a pediatric physical therapist for more than 40 years in multiple settings. In the Peace Corps in Costa Rica, Lynette worked in a rehabilitation institute and as a visiting home therapist. After returning to the United States, she continued her work with children as a visiting home therapist before serving as school therapist for five years. She then worked as a clinical faculty member for seven years at the Child Development and Mental Retardation Center (CDMRC), now Center on Human Development and Developmental Disabilities (CHDD), at the University of Washington. While there, she followed through on a request by a physician to write an assessment for the early identification of children with delays in movement, such as cerebral palsy; subsequently, Lynette and colleagues published the Movement Assessment of Infants (MAI) in 1980. In the succeeding 26 years, Lynette served as an academic faculty member while maintaining a clinical practice. Throughout her years as a faculty member, she continued her research on the MAC, assessing hundreds of children on the earlier editions. In the last year she has worked at The Children's Hospital (TCH), Denver, Colorado, where she was able to use the MAC in a clinical setting. While at TCH she and colleagues established norms for the MAC with support from a grant: GCRC - MO1-RR00069, General Clinical Research Centers Program, NCRR, NIH. Lynette is a Professor Emerita at the University of Puget Sound.

Author
Mary Skillen Andrews, BA, PT, OT

Mary received her degree at Stanford University, an OT certificate at the University of Pennsylvania, and a PT certificate at University of Southern California. Mary has been a pediatric physical and occupational therapist for more than 40 years in multiple settings. She worked as an OT with children in the school environment, as an inpatient and outpatient hospital PT in pediatrics, and as a PT in a residential facility for developmentally disabled children. She became a lecturer at CDMRC, now CHDD at the University of Washington, where she joined her colleagues in writing and publishing the MAI in 1980. Mary then returned to the school environment as a PT. Mary has assessed many children on the earlier editions of the MAC; her clinical expertise has been valuable to the writing and publishing of theMAC.

Author
Marcia F. Williams, PhD, MPH, PT

Marcia earned a Bachelor of Arts degree in Biological Science at Wellesley College, a Certificate in Physical Therapy at Simmons College, a Master of Public Health Degree in Epidemiology and Maternal and Child Health at the University of Washington (UW), and a PhD in Epidemiology at the UW. Dr. Williams is a Lecturer in the Departments of Epidemiology and Rehabilitation Medicine at the UW. She is on the faculty of the Maternal Child Health Program at the UW and is the epidemiology

instructor in the Executive MPH degree program at the UW. Dr. Williams is a licensed physical therapist and a certified instructor in Neurodevelopmental Therapy (NDT) with specialization in NDT for infants. For the past 30 years, she has provided diagnostic evaluations of high-risk infants within the interdisciplinary team of the High Risk Infant Follow-up Clinic, Center on Human Development and Disability, at the UW.

Preface

The Movement Assessment of Children (MAC) is an extensive evaluation of functional gross and fine motor control expected in children two to twenty-four months of age. The format allows the MAC to be completed in 30 minutes or less. This test provides the clinician with an assessment of the quality of gross and fine motor control that is cost effective.

The MAC is used to identify change in gross and fine motor development in small increments. Small increments in motor development provide the examiner with precise identification of a child's motor skills. This precision is useful for identifying delays in a child's motor development and for measuring changes in the motor control of children with disabilities who are receiving intervention services.

The MAC is unique because most of the child's abilities can be assessed with observation of movement in a properly organized test environment. The examiner rarely has to hold the child.

The concept and basic format of the MAC was developed by Lynette Chandler in 1982 as a tool for her doctoral dissertation. The MAC was created from the need for a uniform approach to the evaluation of children referred by professionals and caregivers concerned about a child's possible motor delays. The MAC initially maintained much of the format of its parent test, the Movement Assessment of Infants (MAI), published in 1980. The MAC has evolved through a number of modifications based on feedback from caregivers of the infants tested and professionals in medicine, physical therapy, occupational therapy, nursing, psychology, and communications. Testing and research in Australia, Costa Rica, Switzerland, and the United States have provided the authors with valuable information on development as well as test environments.

The MAC was originally normed on typically developing children from two months to twelve months. It was normed once again in Denver, Colorado between 2006 and 2007 to address the possible changes in infant development created by current child care practices and to extend the assessment to 24 month old children.

Acknowledgements

We remain indebted to Audrey H. Larson for her repeated editing of yet another draft of the MAI and early versions of the MAC. Excessive and misplaced commas and semicolons in the second edition of the MAC are the responsibility of the first author. To Stephanie Quinn we owe our gratitude for her good humor with our constant rewrites and her wonderful presentation of the manual. We also gratefully appreciate Greg Owen's ability to capture the purpose of the MAC on the cover of our assessment.

Many physicians and therapists around the world have influenced our assessment skills and our philosophy of testing children. The Movement Assessment of Children (MAC) is undoubtedly better because of their lectures, research, publications, clinical skills, leadership, and mentoring in the assessment and treatment of children.

Although two of these highly respected professionals did not interact directly with us on the writing and validating of this assessment, we would like to thank them for pointing us in the right direction. Sarah Semans was at Stanford University, Palo Alto, California. She taught us that the task of therapists is to set the children free. Dr. T. Berry Brazelton, Harvard University, Cambridge, Massachusetts taught us that communication with the children is paramount in our work with children.

We are grateful for the support that we received from colleagues while we were working at the Child Development and Mental Retardation Center in Seattle, Washington. We thank Dr. Jerry Sells for challenging us to write Movement Assessment of Infants. Nancy Robinson has our gratitude for her wisdom and mentorship in testing children. To Peggy West and Sue Ingles, we express our appreciation for teaching us the importance of listening to caregivers.

Physicians highly skilled in assessment of children have been generous with their feedback as we focused our attention on the assessment of motor control. Dr. Elsbeth Kông from Bern, Switzerland taught many therapists and physicians around the world about movement and the benefit of neurodevelopmental treatment of children. However, the authors of this assessment are particularly appreciative of the evening that she and Dr. Lorenz Luginbühl, also of Bern, Switzerland spent with us in a discussion of assessment of movement and a critique of an earlier version of the MAC.

Many therapists have made valuable contributions to the development of the MAC. We thank all of them and have selected a few who represent the generous, wise, and knowledgeable colleagues who have nudged us forward, sympathized with setbacks, and cheered at our successes. In Bern, Switzerland Mary Quinton, Jutta Sternberg, and Anke von Steiger all set a high standard for treatment of children with disabilities and taught us much of what we know about movement. Pamela Mullens and Mechtild Rhast, Seattle, Washington honed those skills for us. Jane Sweeney, Tacoma, Washington provided a venue for the research that was most important toward starting the process of validating the MAC and she continues today to encourage our work toward this publication. Teresa Gutierrez, Tacoma, Washington and Sherry Arndt, Hilo, Hawaii have used the earlier versions of the MAC in clinical research, thus helping us refine this assessment. Karen Schuhmann, Brisbane, Australia, Carol Wells, Denver, Colorado, and Mitzi Wiggins, Dallas, Texas provided a venue for our clinical studies with children who have delays in movement. Marge Adams, Bellevue, Washington facilitated many of the studies and supported our work over the years.

To our families and families of the heart who let us test their children and supported us for hours on end, we can only say that we are humbled by your faith in us.

Overview of Movement Assessment of Children

Introduction

Purpose

The MAC is a neurodevelopmental test which provides a comprehensive documentation of the functional gross and fine motor control expected in children two to twenty-four months of age.

Uses

The MAC has a practical format that makes it an efficient and cost effective assessment and can be used as follows:

1) To identify motor delays in children in order to contribute information toward a diagnostic evaluation by a multidisciplinary team.
2) To reassure caregivers and health care professionals that a child does not have a motor delay.
3) To document the need for an early intervention therapy program.
4) To help healthcare professionals and caregivers plan and implement the appropriate exercise program for a child with motor delay.
5) To document effectiveness of treatment of children receiving therapy for delays in functional motor development.
6) To document the efficacy of treatment of children within similar diagnosticgroups.
7) To teach skillful observation of movement.

Precautions

When administering the MAC, the following precautions and limitations should be observed:

1) The MAC should not be used to predict a child's long-term motor development.
2) The information gathered does not identify the causes of a movement deficit and is not to be used to provide a medical diagnosis.
3) Clinical signs which are not documented by the MAC, such as feeding problems and dysmorphic features, should be further assessed.

Structure

It may be helpful to study Table 1 for an overview of the MAC before reviewing the following information.

The MAC is divided into seven **sections**: General Observations, Special Senses, Head Control, Upper Extremities and Hands, Pelvis and Lower Extremities, Primitive Reactions, and Muscle Tone.

Each section includes a variable number of **skills**. For example, the Head Control section has 5 skills while the Upper Extremities and Hands section has 13 skills. An example of a skill within the Upper Extremities and Hands section is Large Grasp with One-Inch Cube.

Each skill includes a variable number of **criteria**. Each criterion within a skill is listed in order of developmental difficulty. Large Grasp with One-Inch Cube, for example, has 4 criteria that can be scored. Note that each skill has a "0" score indicating the inability of the child to complete any of the criteria within the skill.

Following some of the skills, there are notations which have been designated as **Cautions**. See discussion on cautions on page 6.

Throughout the manual, there are words and phrases which have been printed in bold type (1) to remind the examiner to request permission from the caregiver, (2) to indicate precautions in handling the child, (3) to emphasize points in testing procedures and scoring.

Structure: Sections

Each of the seven sections contributes a distinct perspective on the child's functional motor control.

There are three sections on functional motor control: Head Control, Upper Extremities and Hands, and Pelvis and Lower extremities. These sections provide the examiner with the level of functional motor control of the child at the time of the assessment.

The MAC also includes four explanatory domains with criteria that may signal possible factors associated with variance or delays in functional motor development. The four additional domains are: General Observations (includes the evaluation of the child's behavioral state and autonomic nervous system stability), Special Senses (evaluates the child's motor control of vision and responses to sound), and Primitive Reactions and Muscle Tone evaluate a possible therapy diagnosis for any identified delays in fine and gross motor development.

Structure: Skills

Each skill describes a child's possible response to stimulus from the most mature to the least mature response. For example, a skill within Upper Extremities and Hands is Large Grasp with One-Inch Cube. For this particular skill there are four possible responses (called criteria) from the most mature response, "child easily picks up and holds cube securely," to the absence of a response, "child does not grasp cube."

Structure: Criteria

Each criterion describes a child's possible response to a stimulus. Each of the criteria describe a response seen in a typically developing child. Note that the most difficult criterion within a skill is given the highest score. The most mature criterion assessed within Large Grasp with One-Inch Cube is "child easily picks up and holds cube securely." See scoring in Section 4, Skill 4.6 on page 30.

Structure: Cautions

Cautions are described at the end of some skills. They follow the listing of criteria seen in typically developing children. Cautions are responses seen frequently in children who are not typical in development but are seen occasionally in children who are typically developing. An example of a caution is seen in Section 5, Skill 5.9, on page 38, Comes to Sit. "Child assumes a 'W sitting' position in order to come to sit. If this is the only sitting posture, 'W sitting' may indicate trunk instability."

	TABLE 1 OVERVIEW OF TEST STRUCTURE	
Sections	**Skills**	**Criteria In Each Skill**
1.0 General Observations	1.1 - Behavioral State 1.2 - Autonomic Nervous System Stability	3 3
2.0 Special Senses	2.1 - Visual Following 2.2 - Peripheral Vision 2.3 - Hearing	5 3 4
3.0 Head Control	3.1 - Head Centering – *Supine* *3.2* - Head Balanced – *Sitting* *3.3* - Head Righting – *Lateral* 3.4 - Head Righting – *Extension* 3.5 - Head Righting – *Prone Suspension*	3 4 4 4 4
4.0 Upper Extremities & Hands	4.1 - Open Hands 4.2 - Hands to Midline – *Supine* 4.3 - Early Grasp of Object 4.4 - Active Weightbearing on Upper Extremities 4.5 - Reaches Out 4.6 - Large Grasp with One-Inch Cube 4.7 - Transfers 4.8 - Bangs, Claps, Combines 4.9 - Small Grasp with Finger Food 4.10 - Isolates Index Finger 4.11 - Controlled Release 4.12 - Catches 4.13 - Protective Extension – Forward	4 5 3 5 4 4 4 4 4 2 7 5 3
5.0 Pelvis & Lower Extremities	5.1 - Active Use of Lower Extremities – *Supine* 5.2 - Trunk Centering – *Supine* *5.3* - Active Use of Pelvis – *Supine* *5.4* - Back Straight – *Sitting* 5.5 - Incurvation of Trunk – *Sitting* 5.6 - Rolls Over from Supine 5.7 - Sits Independently when Placed 5.8 - Progresses in Prone 5.9 - Comes to Sit 5.10 - Comes to Stand from Floor 5.11 - Gets Down to Floor 5.12 - Cruises 5.13 - Walks 5.14 - Steps Up 1 to 2 Inch Step 5.15 - Steps Down 1 to 2 Inch Step 5.16 - Climbs Up on High Flat Surface 5.17 - Climbs Down from High Flat Surface 5.18 - Jumps Clearing Floor 5.19 - Kicks 5.20 - Ascends Stairs 5.21 - Descends Stairs	3 3 3 5 4 6 5 5 5 8 5 4 7 3 3 2 2 4 4 6 6
6.0 Primitive Reactions	6.1 - Tonic Labyrinthine Reaction in Supine 6.2 - Tonic Labyrinthine Reaction in Prone 6.3 - Asymmetrical Tonic Neck Reaction – Spontaneous 6.4 - Neonatal Positive Support 6.5 - Symmetrical Tonic Neck Reaction – Spontaneous	3 3 3 3 3
7.0 Muscle Tone	7.1 - Upper Extremities 7.2 - Lower Extremities 7.3 - Trunk 7.4 - Type of Muscle Tone	4 4 4 4
Seven Sections	53 Skills	211 criteria

Procedures

Test Materials

Test Materials

MAC Manual
MAC Score Sheet for each child assessed

Equipment

1 small bell with short handle
1 small rattle with a small handle
1 2½-inch diameter ball
1 5 to 6 inch ball (optional)
1 1-inch to 2-inch colorful ball tethered to an elastic string
10 1-inch cubes
5 Cheerios®

Furniture

2 Tri-fold Mats*
1 table high enough to have child sit on a caregiver's lap and have table at chest height of child or a high chair with tray
2 straight back chairs
1 extra chair for a second caregiver
1 set of 6 to 7 inch stairs with secure railing on at least one side. There must be at least two stairs.

Supplies

1 extra large terry cloth towel for each child tested. If videotaping, blue is the color of choice.
Disinfectant**

Child's Favorite Toy

Ask caregiver to bring one of the child's favorite toys.

* Mats can be folded to vary height for climbing.

** Each piece of equipment used in the test setting, including table top, mat, towel, and testing equipment, must be cleaned and disinfected before testing a child. Disinfectant for testing materials must be approved by your clinic.

Testing

Examiner

It is the responsibility of the examiner to achieve at least 90% interrater reliability with a qualified examiner in the clinic. This level of reliability needs to be achieved for children in the age group typically seen in the examiner's clinic.

Duration of Testing

The first administration of the MAC takes no longer than 30 minutes to administer and score; however, this timing presumes that the examiner is not expected to take a history from the caregiver. If the examiner is to take a history and establish a trusting relationship with caregiver, an additional 20 minutes is needed. Retesting a child receiving therapy takes 5-10minutes.

Test Environment

The room should be a quiet place where the child and caregivers can be at ease. It should be large enough for the required furniture and to provide open space where a child can crawl, walk, and jump. A long, wide, and clear hallway can be used for observing the child walking and running. The examiner should not wear jewelry or distracting clothing.

Rapport

The child should always be accompanied by a caregiver who will remain throughout the assessment. If possible, the child should be scheduled at a time that the caregiver indicates is best for the child. The examiner should make every effort to elicit the child's best performance. If a child cannot maintain an optimal behavioral state for the testing, the child should be rescheduled. Irritability during a second assessment should be explored further with the child's physician.

Calculation of Child's Age

The child's age must be calculated to the day. Gestational age is entered into the calculations. Norms are established from the 16th day of one month through the 15th day of the following month, thus a child who is 9 months 17 days will be considered a ten month old. See Appendix.

Order of Testing

Although there is a suggested order for test administration based on the authors' experience, there is no required order.

If the child does not have head control, begin the assessment by having the caregiver place the child supine on the mat and talk to the child until the child seems comfortable. Start the assessment with skills that require visual tracking and turning to sound. If the child has head control, skills that require

visual tracking, turning to sound, and manipulation should be presented with the child on the caregiver's lap at the beginning of the assessment when the child is not tired.

Do not test Protective Extension if the child does not have head control. If the child has head control, present the Skills most likely to cause distress, such as Protective Extension and Prone Suspension, at the end of the assessment. Grouping of skills by test position is important in order to avoid tiring the child. The examiner should maintain a symmetrical position in relation to the child except when observing from the side. Allow time to observe the child's spontaneous movement throughout the exam. Holding or moving the child should be minimized.

Recording Skills

The score for the most mature form of the skill observed during the assessment is circled on the score sheet. Note that the most difficult criterion within the skill is given the highest score. For example, the most mature criterion assessed within Large Grasp with One-Inch Cube, for example, is "child easily picks up and holds cube securely." The score of "3" in this example is circled on the score sheet. The assumption is then made that the child has the ability to complete all the lower scored criteria within that skill.

Recording Asymmetries

The examiner assesses both left and right sides when a skill can be done in isolation on one side. When there is a numerically different score for left and right sides, the asymmetry will be noted in the difference between the Sum of Section Scores for the left and right sides. See calculation of Asymmetry Scores on page 15.

The authors have noted in their clinical observations that many typically developing children demonstrate some asymmetries; however, when asymmetries are scored as predominately stronger on one side in several skills, the child's physician should be informed.

Recording Cautions

Cautions are described at the end of some skills. The examiner checks the box when a caution is observed. See Caution Scores on page 15.

Summary of Scores

1. Sum of Section Scores

A sum of numerical scores is given for each of the seven sections: General Observations, Special Senses, Functional Movement – Head Control, Functional Movement – Upper Extremities and Hands, and Functional Movement – Pelvis and Lower Extremities, Muscle Tone, and Primitive Reactions. The examiner adds and enters the scores for the left column and then adds and enters scores for the right column. If there are no asymmetries in a section, the left and right columns will have the same scores and the examiner adds only one column. The examiner calculates the Functional Movement – Total Score by adding the summary scores for the sections for Head Control, Upper Extremities and Hands, and Pelvis and Lower Extremities. (See Table2.)

2. Sum of Asymmetry Scores

An asymmetry score is the difference between the sum of the left and the sum of the right columns for a section. The examiner subtracts the lower score of the two columns from the higher score of the two columns to determine the number of asymmetries for six of the seven sections. There are no possible asymmetries for General Observations. (See Table2.)

3. Sum of Caution Scores

The examiner adds the number of cautions that have been checked in each of six sections. There are no cautions for General Observations or Special Senses. (See Table 2.)

Table 2 **Summary Scores**	**Score Left**	**Score Right**	**Number of Asymmetries***	**Number of Cautions**
General Observations			xxx	xxx
Special Senses				xxx
Functional Movement: Head Control				
Functional Movement: Upper Extremities and Hands				
Functional Movement: Pelvis and Lower Extremities				
Functional Movement: Total				
Primitive Reactions				
Muscle Tone				
Totals				

* The difference between the left and right scores for each section is the score for asymmetry for that section.

4. Examiner's Impressions

This summary reflects the examiner's impression of the child's performance in each of the seven sections. General Observations, Special Senses, Functional Movement – Head Control, Functional Movement – Upper Extremities and Hands, and Functional Movement – Pelvis and Lower Extremities, Primitive Reactions and Muscle Tone each receive a score of the examiner's impression. The examiner makes an informed decision about the child's motor control, taking into account the skills in General Observations and Special Senses along with the testing environment and other relevant factors. The impressions are not a summary of numerical scores. The highest score is given for movement considered to reflect a typically developing child. (See Table3.)

The examiner documents impression of General Observations (Behavioral State and ANS Stability) using the following scale:

2 - There are no concerns about the Skills in General Observations.

1 - There are concerns about the Skills in General Observations.

The examiner documents impressions of Special Senses (Visual Following, Peripheral Vision, and Hearing Screen) using the following scale:

2 - There are no concerns about the Skills in Special Senses.

1 - There are concerns about the Skills in Special Senses.

The examiner documents impressions of the child's Functional Movement for Head Control, Upper Extremities and Hands, and Pelvis and Lower Extremities using the following scale:

3 - Functional movements appear to be typical.

2 - Functional movements are immature and suggest possible delay.

1 - Functional movements are delayed.

The examiner documents impressions of the child's Primitive Reactions using the following scale:

3 - Primitive reactions appear to be normal.

2 - Integration of primitive reactions is delayed but functional movement is not compromised.

1 - Integration of primitive reactions is delayed and functional movement is compromised.

The examiner documents impressions of the child's Muscle Tone using the following scale:

3 - Muscle tone appears to be normal.

2 - Muscle tone shows evidence of high, low, or fluctuating tone but functional movement is not compromised.

1 - Muscle tone is high, low, or fluctuating and functional movement is compromised

Table 3 **Examiner's Impressions**	Left	Right
General Observations: 2 = No Concern; 1 = Concern		
Special Senses: 2 = No Concern; 1 = Concern		
Functional Movement - Head Control: 3 = Typical; 2 = Immature; 1= Delayed		
Functional Movement: UE and Hands 3 = Typical; 2 = Immature; 1= Delayed		
Functional Movement: Pelvis and LE 3 = Typical; 2 = Immature; 1= Delayed		
Primitive Reactions: 3 = Normal; 2 = Immature; 1= Delayed		
Muscle Tone: 3 = Normal; 2 = Atypical but functional movement not compromised; 1 = Atypical & functional movement compromised		

Interpretation

Expected Scores:

The norms have been established, there is a table listing the means and standard deviations for each age for the seven sections of the MAC.

The examiner calculates the **expected scores** for each section according to their clinic's standards. Each of the child's actual scores is divided by the expected scores and multiplied by 100.

Sections:

The examiner should pay close attention to percent scores that fall below 70%. The apparent delay may suggest a **therapy diagnosis**, the need for a **reassessment**, **referral** to a professional with a specific expertise, or **notification** of the primary care physician (PCP). Four examples follow:

- If a child scores below 70% on Pelvis and Lower Extremities, minimally delayed in Upper Extremity and Hands, and typical in development for Head Control, a **therapy diagnosis** may be diplegia. The focus of therapy would then be on the lower extremity functions and trunk control.
- If the child cannot maintain an optimal Behavioral State in the General Observation section or if the caregiver does not believe the child's response to the assessment was typical for the child, then a **reassessment** should be scheduled.
- If the visual skills in the section on Special Senses are delayed and the fine motor skills in the section on Upper Extremities and Hands are also delayed, a **referral** to a vision specialist should be pursued through the PCP.
- The PCP should be kept fully informed at all times. However, if a therapist has concerns about the child's health because of the child's scores in the General Observation section, the PCP should be **notified** immediately.

Reassessment:

Upon reassessment of a child, the examiner can, given the child's assessment and reassessment percent scores, make the following clinical determination:

- the child is catching up to the age cohort
- the child is staying at the same relative position compared to the age cohort
- the child is falling further behind the age cohort

If the child is falling further behind the age cohort, the examiner evaluates the raw scores of the assessment and reassessment. If the reassessment raw score is lower than the previous assessment score, the child's PCP should be informed immediately.

Goal Setting

The MAC can be used for goal setting. The column entitled "Age Expected" will list the age norm in months for typically developing children.

Goal setting proceeds as follows: Score the skill. Look at the Age Expected column and place a check mark in the goal column by any unsuccessful criteria that the child should have completed, given the child's corrected age.

Example: If the four month old child scores a "1" on Head Righting-Lateral, circle the "1". Look at the Age Expected column and place a check mark in the goal column by any criterion not achieved by the child that have an expected age less than four months; place a check mark by "child predominately holds head in alignment with body." This skill, that the child did not complete, is a skill that typically developing children would be expected to complete. This functional skill becomes the goal for Head Righting-Later- al. (See Table5.)

Table 5
Example of Goal Setting

3-2. Head Righting-Lateral	**Score L**	**Score R**	**Age Expected**	**Goal**
3 - Child consistently corrects head past midline.	3	3	7	
2 - Child predominantly holds head in alignment with body. Child may correct head past midline.	2	2	3	√
1 - Child does not align head with body but holds head in a fixed position.	(1)	(1)	2	
0 - Child does not hold head in a fixed position. Examiner supports child's head throughout testing.	0	0	NA	

Test Administration

1.0 General Observations

1.1 Behavioral State

Ideal behavioral state for an infant is "quiet alert"; infants may enter a fussy or drowsy state briefly but rapidly recovers when returned to caregiver or to a supportive position. Older child is curious and interactive; child may be cautious or shy but participates with encouragement from a caregiver or older sibling; child may wish to do things their way and challenge the examiner, but ultimately completes the tasks.

2 - Child's behavior **supports** an accurate **interpretation** of the assessment.

1 - Child's behavior may compromise the interpretation of the assessment.

0 - Child's behavior does not allow for an accurate interpretation of the assessment.

1.2 Autonomic Nervous System Stability

Observe the child's control of the autonomic nervous system (ANS) throughout the exam.

Autonomic nervous system stability (ANS) includes a regular pattern of respiration, consistent skin coloring, rhythmic/expected visceral responses, and smooth movements. Instability of the ANS is demonstrated by irregular breathing patterns (increased, decreased, or pauses in breathing), by changes in skin tones (blotched, red, dusky or blue), by unstable visceral responses (gag, spit up, hiccup, and/or grunting), and/or unstable movement responses (tremors and/or startles).

If the child demonstrates **immediate and persistent ANS instability**, examiner should not continue the exam. The examiner should suggest that the caregiver seek medical advice promptly.

2 - Child's ANS function supports accurate assessment of motor development and allows child to participate fully throughout the assessment.

1 - Child's ANS function demonstrates some instability that responds positively to special handling. This may compromise child's ability to participate fully throughout the assessment.

0 - Child demonstrates persistent ANS instability that is not altered by special handling. The assessment is stopped and caregiver assisted in calling for immediate medical referral.

2.0 Special Senses

2.1 Visual Following

With the child sitting securely on the caregiver's lap at a table with the child's mid-trunk at table-top level, present a colorful object in midline at level of child's chin. An effective way to present this skill is to gain the child's attention by rolling a small ball on the table from side to side. Once the child tracks the ball, complete the test using the ball. When the child's attention is drawn to the object, move the object horizontally through a range of approximately 80° from midline. From that position, move the object back to midline, pause in midline, and then move it 80° to the opposite side. If the **child does not have head control**, assess the child in supine. An effective way to present this skill to a child in supine is to encourage the child to follow your face. If visual following is not demonstrated, repeat sequence only one more time. If there is no response to the second set of trials, **stop** testing. This skill may be repeated after all skills have been completed. If child follows to one side only, indicate that side on the score sheet. If there are concerns about the child's visual response, the child should be referred for a visual exam.

4 - Child follows object with **eyes and head** through a **full range** of horizontal movement; movement is continuous. A child may occasionally be distracted, but visual attention is easily regained. 4 4

3 - Child follows object with **eyes and head** through a **partial range** of horizontal movement. A child may occasionally be distracted; visual attention must be regained. 3 3

2 - Child follows object with **eyes and then head** through a **partial range** of horizontal movement. A child may occasionally be distracted; visual attention must be regained. 2 2

1 - Child occasionally focuses on object; eyes may follow object but head does not follow.

0 - Child does not focus on object or the response is so inconsistent that interpretation is difficult.

2.2 Peripheral Vision

Child sits securely on the caregiver's lap at a table with the child's mid-trunk at table-top level. Examiner stands behind child. When the child's head is in midline, bring a silent but colorful object forward on one side at chin height so that the child looks slightly downward and sideways to see the object. Repeat this procedure on the opposite side. If the **child does not have head control**, test the child in supine. If the child cannot center their head in supine (see 3.1), cradle child's head gently in midline.

2 - Child turns eyes to look at object when it is at approximately 45° from midline.

1 - Child turns eyes to look at object only when examiner brings it past 45° toward midline.

0 - Child does not turn eyes or the response is so inconsistent that interpretation is difficult.

If the response on either side is unclear, repeat testing only one more time on each side. If there is no response to the second set of trials, **stop** testing. This skill may be repeated after all skills have been completed. If child turns to one side only, indicate that side on the score sheet.

2.3 Hearing Screen

Child sits securely on the caregiver's lap at a table with the child's mid-trunk at table-top level. Examiner stands behind child. When the child's head is in midline, shake a rattle once approximately six inches below the ear and out of the child's sight. Child must not be attracted visually by movement of examiners arm or the test object. Repeat this procedure on the **opposite** side. If the **child does not have head control**, assess the child in supine. If the child cannot center their head in supine (see 3.1), cradle child's head gently in midline. This skill may be repeated after all skills have been completed. If child turns to one side only, indicate the side on the scoresheet.

If there are concerns about the child's hearing, the child should be referred for an audiological examination.

3 - Child turns **immediately** to sound.

2 - Child turns to sound, but **response is delayed**.

1 - Child stills (quiets physical activity) to sound; eye widening may be observed.

0 - Child does not respond to sound or the response is so inconsistent that interpretation is difficult.

If the response to the right and left trials is unclear, change the stimulus to a bell and repeat testing. If there is no response to the second set of trials, **stop** testing.

3.0 Functional Movement – Head Control

3.1 Head Centering – *Supine*

Place the child in supine. Observe the predominant orientation of the child's head in a resting position and the child's ability to look straight up. A visual stimulus may be used to attract the child's attention. In infants, less than three months of age, the head is often turned to one side but there is not a strong preference for left or right side. Persistent head turning to one side should be noted. Record the side to which the child's face is more often turned. If the child is able to center the head while sitting, give the highest score. If the child has a torticollis, give the lowest score.

2 - Child is able to move head to midline and consistently maintains the head centered.

1 - Child is able to move head to midline but **does not maintain** the head centered.

0 - Child is unable to move head to midline.

Caution: Persistent head turning to one side. Note side to which face is turned.
Caution: Persistent lateral flexion to one side. Note side of lateral flexion.
Caution: Persistent lateral flexion to one side with head turning to the opposite side is suggestive of a torticollis. Note side of lateral flexion.

3.2 Head Balanced – *Sitting*

Child is held securely in a supported and erect sitting position. Observe the child's ability to maintain an upright and stable head position. Head balance may be observed throughout the assessment.

3 - Child's head is upright and stable for all activities.

2 - Child's head is upright and stable when child is held securely; head bobs when child is moved.

1 - Child's head is upright but not stable; head bobs.

0 - Child has little or no head control. **Caregiver or examiner must support child's head when as- sessing this skill.**

3.3 Head Righting - *Lateral*

Do not test this skill if the child scores a "0" on 3.2, Head Balanced.

If the child receives a "3" or a "2" on this skill, assess Incurvation of Trunk in Sitting, (Skill 5.5).

Place the child in sitting on a surface which can be tilted (lap, bolster, ball). Face the child away from you. If the child is unable to sit independently, support at the sides of the trunk as low as possible. If the child is able to sit independently, support at the sides of the pelvis. Have the caregiver get the child's attention by holding an attractive object at the child's midline, chin level, and just out of reach. Tilt the surface in order to shift the child's weight over one hip. Observe the response of the head and neck on the non-weightbearing side. Repeat the procedure a second time. Pause to stabilize the child in midline before assessing opposite side.

3 - Child consistently corrects head **past midline**.

2 - Child predominately holds head in alignment with body; child may correct head past midline.

1 - Child does not align head with body, but holds **head in a fixed position**.

0 - Child does not hold head in a fixed position. **Caregiver or examiner must support child's head when assessing this skill.**

3.4 Head Righting - *Extension in Prone*

Place the child prone and observe from the side. A visual or auditory stimulus may be used to encourage the child to lift head. Child **should not be placed prone unattended.**

3 - Child raises head in midline to at least 45° from the surface toward vertical and easily moves in and out of this position. Child can turn head in either direction (left or right) while maintaining extension.

2 - Child raises head at least 45° from the surface toward vertical but cannot maintain this position. Head may not be held in midline.

1 - Child raises head briefly clearing surface.

0 - Child does not raise head.

Caution: Child does not raise head.

3.5 Head Righting - *Prone Suspension*

Place the child prone. Lift child from prone lying with examiner's hands at sides of the child's trunk between the nipple line and the level of the umbilicus. Hold the child face down approximately 24 inches above a protective surface. Observe the child's posture and movement. If necessary, a visual or auditory stimulus may be used to encourage the child to lift thehead.

If the child receives the highest score on this skill, assess Protective Extension - Forward (Skill 4.13).

3 - Child actively raises and **maintains head above or in line** with back.

2 - Child raises head in line with back but does not maintain head in line with back.

1 - Child does not raise head in line with back but holds head in a fixed position.

0 - Child does not raise head in line with back; child does not hold head in a fixed position.

Caution: Child collapses over the examiner's hands.

Caution: Child collapses over the examiner's hands alternating with overly extended posture.

4.0 Functional Movement – Upper Extremities and Hands

4.1 Open Hands

Observe the child's hands throughout testing. Developmentally, the child progresses from fisted hands, to flexed fingers, to open hands. Hand opening as part of a startle reaction or Moro reaction is not considered hand opening.

3 - Child has predominantly open hands; hand closing is purposeful.

2 - Child may have hands open or closed. If closed, child opens hands when looking at or reaching for an object.

1 - Child has variable finger movements (finger play); child may explore textures with hands.

0 - Child may have hands open or closed; hand opening and closing is not purposeful; there is no "finger play".

Caution: Child predominately holds thumbs in palm (indwelling thumb).

Caution: Child has hands tightly fisted.

Caution: Child opens hands with fingers hyperextended.

4.2 Hands to Midline – *Supine*

With the child in supine, observe the child's ability to bring hands to midline. Observe the activity of upper extremities. If the functional movement is different between the left and right extremities, score each separately. If the child sits independently and engages hands in bilateral activities, the child receives the highest score.

4 - Child brings hands to anterior surface of knees or feet rather than midline.

3 - Child easily brings hands to midline forming an arch away from the body.

2 - Child can bring **hands to midline**, but hands are held close to or resting on the body.

1 - Child brings **hands to mouth**.

0 - Child does not bring hands to midline or to mouth.

4.3 Early Grasp of Object

With the child in supine, present an object. The preferred testing object is a toy that fits easily into a child's hand. If child does not grasp the object, touch the back of the child's hand with the object. If the child's hand opens, place rattle in the hand. Do not pry the hand open to place object.

2 - Child voluntarily grasps object, holds object securely, and shakes or moves the object.

1 - Examiner places object in child's hand. Child holds object loosely and briefly.

0 - Examiner places object in child's hand, but the child does not hold object or examiner is unable to place object in the child's hand.

4.4 Active Weightbearing on Upper Extremities

With the child in prone, observe the use of the upper extremities. Score the weight bearing arm. If the child assumes a position on hands and knees, the child receives the highest score.

4 - Child supports self on one forearm or hand while **reaching for an object** with the other arm. Score weight bearing arm.

3 - Child supports self on extended arms and bears weight on hands.

2 - Child bears weight on forearms and hands with arms **forward of shoulders**; child may move arms back in line with shoulders.

1 - Child bears weight on forearms; **elbows are typically in line with the shoulders; elbows may briefly move behind shoulders.**

0 - Child typically has **elbows behind shoulders.**

4.5 Reaches Out

With the child in supine, present an object in midline at arms length. If the child does not grasp it, place the object close to the child's hand. Touch the child's hand with the object if necessary to gain the child's attention. The preferred testing object is a toy that fits easily into a child's hand and can be dangled in front of the child. Observe and score the activity of upper extremities separately. If a child refuses to remain in supine, test child sitting on the caregivers lap. Upper extremities must be unsupported. If the child sits independently and easily reaches out and grasps objects, the child receives the highest score.

3 - Child reaches out promptly and directly to touch a non-moving object presented **at shoulder height, in midline and at arm's length.**

2 - Child reaches out promptly and directly to touch a non-moving object presented **in midline close to the child's trunk.**

1 - Child makes random movements in the direction of an object presented **in midline close to the child's trunk** but does not touch it.

0 - Child does not attempt to reach for the object.

4.6 Large Grasp with One-Inch Cube

With the child sitting securely on the caregiver's lap at a table with the child's mid-trunk at table-top level, place a 1-inch cube on the table and push it within the child's reach directly in front of the child. Do not hold the cube in place. Observe and score the child's ability to grasp the cube with each hand separately. If the child shows a hand preference, present the cube closer to the non-preferred hand. It may be necessary to have the caregiver gently restrain the child's preferred hand.

3 - Child **easily picks up** and **holds cube securely**.

2 - Child picks up cube but has difficulty grasping the cube and may not hold cube securely.

1 - Child is able to pick up cube by trapping it with both hands but cube is not held securely; examiner may hold cube in place.

0 - Child does not grasp cube.

4.7 Transfers

With the child sitting securely on the caregiver's lap at a table with the child's mid-trunk at table-top level, place a 1-inch cube on the table and push it within the child's reach directly in front of the child. Observe the child's handling of the cube. Score hand which is releasing cube. This skill may be observed throughout the assessment with any small object.

3 - Child transfers object from one hand to the other using voluntary release; object must not be trapped against a surface.

2 - Child transfers by pulling object from one hand with the other hand; object must not be trapped against a surface.

1 - Child transfers object from one hand to the other using mouth or other surface to trap object.

0 - Child does not transfer object from one hand to theother.

4.8 Bangs, Claps, andCombines

With the child sitting securely on the caregiver's lap at a table with the child's mid-trunk at table-top level, present two cubes to the child so that a cube is held in each hand. Examiner may demonstrate banging the cubes together. Observe the child's ability to bring the cubes together in midline. Note: If child combines objects other than the cubes, this skill may be scored.

3 - Child combines objects more than one time.

2 - Child claps hands together more than one time.

1 - Child bangs object on table more than one time.

0 - Child does not bang object, clap, nor combine objects more than one time throughout testing.

Caution: Child consistently uses only one upper extremity and hand. Score inactive extremity.

4.9 Small Grasp with Finger Food*

Describe this skill to the caregiver and obtain the caregiver's permission to present the finger food.

With the child sitting securely on the caregiver's lap at a table with the child's mid-trunk at table-top level, place finger food on the table and push it within the child's reach directly in front of the child. Observe and score the child's ability to grasp the finger food with each hand separately. If the child grasps a finger food, split it into smaller pieces and present again. Child's hands and the table surface must be dry. If the child shows a hand preference, present the finger food closer to the non-preferred hand. It may be necessary to have the caregiver gently restrain the child's preferred hand.

3 - Child picks up a piece of the Cheerio® with **thumb and one finger tip.**

2 - Child picks up a piece of the Cheerio® with **any grasp** other than a thumb and finger tip.

1 - Child picks up the whole Cheerio® with **any grasp**.

0 - Child **cannot grasp** finger food.

* Gerber Finger Foods Veggie Puffs® should be used with the younger child. If the child is able to chew, General Mills Cheerios® may be used.

4.10 Isolates Index Finger

With the child sitting securely on the caregiver's lap at a table with the child's mid-trunk at table-top level, place an object of interest on the table and push it within the child's reach directly in front of the child. Point to the object. Observe and score the child's ability to isolate index finger. This skill may be observed throughout the assessment.

1 - Child isolates index finger to explore an object or point to an object or person.

0 - Child does not isolate index finger.

4.11 Controlled Release

With the child sitting securely on the caregiver's lap at a table with the child's mid-trunk at table-top level, place ten 1-inch cubes within the child's reach directly in front of the child. Examiner may demonstrate the stacking of cubes. Count number of cubes that child stacks successfully. If the child does not stack cubes,have caregiver request the cube from the child.

6 - Child stacks **eight, nine, or ten** 1 inch

cubes. 5 - Child stacks **six or seven** 1 inch

cubes.

4 - Child stacks **four or five** 1 inch cubes.

3 - Child stacks **two or three** 1 inch

cubes.

2 - Child gives cube to caregiver or examiner or child throws cube intentionally.

1 - Child hands cube to caregiver or examiner but child does not release the object.

0 - Child does not intentionally attempt to release cube.

Caution: Child hyperextends fingers when releasing cube.
Caution: Child stacks cubes with only one hand. Score inactive hand.

4.12 Catches

This assessment evaluates **early** catching skills. Mature catching, defined as catching a ball with one or both hands, is seldom seen by 24 months of age; therefore, it is not scored on this test. With child standing or sitting four to five feet from the examiner, the examiner gently tosses or rolls a 5-6 inch diameter ball to the child and observes the child's response.

4 - Child stands with arms directly in front of body, elbows extended, and palms up or facing each other. As the ball contacts hands, child **secures** ball against chest.

3 - Child stands with arms directly in front of body, elbows extended, palms up or facing each other. As the ball contacts hands, child **attempts to secure** ball against chest but is unsuccessful.

2 - Child stands as if to catch ball but there is no attempt to secure ball against chest.

1 - Child sits with legs spread apart and knees extended; child attempts to trap or catch ball.

0 - Child does not interact with ball.

4.13 Protective Extension - Forward

Do not test this skill on a child if the child does not score a "2" in Head Righting – Prone Suspension (Skill 3.5).

Describe this skill to the caregiver and obtain permission to test this skill.

Hold the child in prone suspension and rapidly lower the child headfirst toward the testing surface. Observe the response of the child's upper extremities. Test **no more than two times**. Protective extension to the side is not tested because it emerges at approximately the same time as protective extension forward.

2 - Child moves arms forward, extends elbows, and attempts to **support weight on open hands**.

1 - Child moves arms forward and supports weight on fisted hands, or child does not support weight on hands.

0 - Child does not move arms forward.

Caution: Child supports weight on one fisted hand and one open hand. Score the fisted hand.

Caution: Child moves only one arm forward. Score inactive arm.

5.0 Functional Movement – Pelvis and Lower Extremities

5.1 Active Use of Lower Extremities – *Supine*

Place the child supine and observe the spontaneous movements of the child's lower extremities. If the child independently achieves sitting using rotation, the child receives the highest score.

2 - Child kicks lower extremities randomly with or without rounding buttocks off the supporting surface.

1 - Child kicks lower extremities together.

0 - Child shows minimal movement of lower extremities.

Caution: There is minimal movement of lower extremity(ies). Note which extremity(ies) show minimal movement.

5.2 Trunk Centering – *Supine*

Place the child supine and observe the alignment of the child's pelvis and shoulder girdle.

2 - Child easily centers trunk; child maintains pelvis and shoulder girdle aligned.

1 - Child can center trunk; child does not maintain pelvis and shoulder girdle aligned.

0 - Child does not center trunk.

5.3 Active Use of Pelvis – *Supine*

Place the child supine and observe the spontaneous movements of the child's pelvis. If the child independently achieves sitting using rotation, the child receives the highest score.

2 - Child rounds buttocks off the supporting surface and easily moves into and out of a stable, symmetrical **posterior pelvic tilt.**

1 - Child can round buttocks off the supporting surface but cannot move easily into and out of a symmetrical pelvic tilt.

0 - Child does not round buttocks off the supporting surface.

5.4 Back Straight – *Sitting*

Do not test this skill if the child scores a "0" on 3.2, Head Balanced.

With the child in supported or independent sitting on a firm surface, observe back extension from the side. In independent sitting, child sits without propping with arms. In supported sitting, examiner holds child firmly at the hips. Do not allow child to **sag** forward. This skill may not be scored while the child is "W sitting" or "kneel sitting." **"W sitting"** refers to sitting with hips internally rotated and flexed to 90°, knees maximally flexed, and buttocks between feet. **"Kneel sitting"** refers to sitting with buttocks resting on heels.

4 - Child sits independently. Child maintains a straight back down to buttocks.

3 - Child sits independently. Child can achieve but does not maintain a straight back down to buttocks.

2 - Child sits independently. Child can only straighten upper back.

1 - Child in supported sitting straightens upper back.

0 - Child in supported sitting remains in a round back position.

Caution: Child sits independently with a posterior pelvic tilt.

Caution: Child sits independently or in supported sitting with hyperextension of neck.

5.5 Incurvation of Trunk – *Sitting*

Do not test this skill if the child scores a "0" or a "1" on 3.3, Head Righting – Lateral.

Score Weight Bearing Side

Place the child in sitting on a surface which can be tilted (lap, bolster, ball). Face the child away from you. If the child is unable to sit independently, support at the sides of the trunk as low as possible. If the child is able to sit independently, support at the sides of the pelvis. Have the caregiver get the child's attention by holding an attractive object at the child's midline, chin level, and just out of reach. Tilt the surface in order to shift the child's weight over one hip. Observe the response of the head and trunk on the non-weightbearing side. Repeat the procedure a second time. Pause to stabilize the child in midline before assessing opposite side.

3 - Child exhibits incurvation of the trunk when held at the sides of the pelvis.

2 - Child exhibits trunk incurvation when held at level of lower ribs.

1 - Child exhibits midline trunk stability when held at level of lower ribs.

0 - Child does not exhibit trunk incurvation and does not demonstrate midline trunk stability when held at level of lower ribs.

5.6 Rolls Over From Supine

Score Weight Bearing Side

Place the child supine with feet toward you and encourage the child to roll to prone. Use an attractive toy or other stimulus as needed. If the child rolls independently, child uses distinct rotation between pelvis and shoulder girdle followed by realignment. If the child does not demonstrate definite trunk rotation or does not roll independently, try to rotate the trunk by flexing the child's hip and knee and bringing the leg across the body. Keep hand on pelvis. Do not rotate child using any part of the lower extremity. Pause when child's flexed knee touches the surface and observe child's active response. If the child independently achieves sitting using rotation, the child receives the highest score.

5 - Child rolls **independently** from supine over one side and **into sitting or partial sitting** with weight on one hip.

4 - Child rolls **independently** from supine **to prone.**

3 - The examiner **assists** the child in rolling. Child uses **lateral flexion** of neck to bring **head off of the surface** to complete the roll. Child may or may not free arms.

2 - The examiner **assists** the child in rolling. Child uses **hyperextension** rather than lateral flexion of the neck in attempt to bring head off of the surface. Child has difficulty or is unsuccessful realigning the pelvis and shoulder girdle. Child may or may not free arms.

1 - The examiner **assists** the child in rolling. Child maintains head on the surface throughout the roll. Child has difficulty or is unsuccessful realigning the pelvis and shoulder girdle. Child may or may not free arms.

0 - The examiner **assists** the child in rolling. Child does not attempt to realign the pelvis and shoulder girdle.

Caution: Child always rolls over left or right side when rolling independently . (Score non-weight bearing side.)

Caution: Child uses upper extremities to pull trunk and lower extremities into a roll.

5.7 Sits Independently When Placed

Place the child in a sitting position on a firm surface. Guard the child against a fall but do not provide unnecessary support. If child sits securely without arm support, place a toy just out of reach. Observe the child's ability to remain in the sitting position. If the child independently achieves **full upright sitting** by using rotation and maintains sitting without arm support, the child receives the highest score. Do not prop the child in sitting. Do not score this skill while the child is "W sitting." **"W sitting"** refers to sitting with hips internally rotated and flexed to 90°, knees maximally flexed, and buttocks between feet.

4 - Child reaches for an object placed just out of reach. Child grasps the object and returns to the upright position.

3 - Child sits securely without arm support.

2 - Child sits without using arms for support but is unstable.

1 - Child sits by propping self with arms.

0 - Child does not sit independently.

5.8 Progresses in Prone

Observe the child's mode of independent progression while in prone. If child does not creep on hands and knees and does not crawl on abdomen, attempt to elicit a pivot to the left and to the right.

4 - Child crawls forward on **hands and knees** or on hands and feet with reciprocal movement.

3 - Child crawls forward on **abdomen** with random movement of arms and legs.

2 - Child **pivots in circular motion** on abdomen for at least 1/4 turn (90°).

1 - Child pushes on hands and **may slip** backward when attempting to move forward.

0 - Child makes **no progress** as described above; see cautions below.

Caution: Child progresses forward in prone in a manner not described above. For example: 1- Child appears to hop forward by placing both upper extremities on surface and pulling lower extremities forward simultaneously; hips are tightly flexed; child lacks reciprocal movement of arms and legs. 2 - Child uses both arms, one knee and one foot. Score non-weight bearing side. 3 - Child progresses forward using arms only.

Caution: Child progress forward in sitting. For example: 1 - Child may hitch forward on one buttock, using one arm. Score non-weight bearing side. 2 - Child pulls self forward using leg only. Score non-weight bearing side.

5.9 Comes to Sit

Score Weight Bearing Side

Observe the child's ability to get into an **upright sitting position** from prone or supine using trunk rota- tion. This skill can be scored on the basis of one side unless there is concern for delay on the opposite side.

4 - Child achieves sitting from supine, using partial sit-up; child rotates onto one hip, using upper extremity support to achieve sitting. Child may move directly to standing without sitting.

3 - Child achieves sitting from hands and knees using rotation; child sits on one hip and rotates into sitting.

2 - Child achieves a partial sitting position from hands and knees; child sits with weight on one hip using upper extremity or extremities for balance but does not rotate trunk into sitting.

1 - Child assumes a "W sitting" position. Child achieves "W sitting" by symmetrically pushing into sitting. "W sitting" refers to sitting with hip internally rotated and flexed to 90°, knees maximally flexed, and buttocks between feet.

0 - Child is unable to get to a sitting or partial sitting position independently.

Caution: Child always assumes a "W sitting" position in order to come to sit. If this is the only sitting posture, "W sitting" may indicate trunk instability.

5.10 Comes to Stand from Floor

Score Leading Leg

Observe the child's ability to come to a standing position from a firm surface using a low table or chair for support. Place an attractive toy on table or chair to encourage child to come to stand. This skill can be scored on the basis of one side unless there is concern for delay on the opposite side.

7 - Child stands up by moving from quadruped to half kneel to standing; child **does not use** upper extremities for stability.

6 - Child stands up by moving from quadruped to half kneel to standing; child uses **upper extremities** for stability.

5 - Child stands up by moving from quadruped into a **squatting or semi-squatting** position to standing; child uses **upper extremities** for stability.

4 - Child stands up **using furniture for support**; child uses kneel to half-kneel movements to achieve a standing position. In the half-kneel position, the legs are well separated with hip and knee of the forward leg flexed to 90 degrees.

3 - Child stands up **using furniture for support;** child comes to stand using half-kneel movements **without clear separation of legs**.

2 - Child stands up **using furniture for support**; child pulls self up with arms with little or no leg separation.

1 - Child kneel stands **using furniture for support**; child cannot come to stand.

0 - Child does not initiate come to stand.

Caution: Child has little or no leg separation.

Caution: Child always uses left or right leg to stand. Score leg which does not come forward.

5.11 Gets Down to Floor

Observe the child's ability to get down to the floor. Examiner may need to tempt the child to pick up a favorite toy.

4 - Child **squats down without holding on** and stays briefly in this position. May play in this position. 3 - Child s**quats down without holding on** but does not maintain this position.

2 - Child squats down but must hold on to get down. The movement is controlled.

1 - Child holds on to get down **using any method other than a squat.** The last tenth of the movement may lack control.

0 - Child does not get down from standing.

5.12 Cruises

Score Leading Leg

Observe the child's ability to step sideways while using light support on furniture with one or both hands. Child must have pulled self to stand at the furniture. Score each side separately. If child is walking independently, the child receives the highest score.

3 - Child cruises quickly and easily.

2 - Child cruises by taking at least one or two steps in one direction with full weight shift of leading lower extremity.

1 - Child attempts to cruise but makes little or no progress; child sometimes appears to lead with upper extremities on supporting surface.

0 - Child does not attempt to cruise.

Caution: Child alternates between dorsiflexion and plantarflexion of the ankles when cruising but is predominately in plantarflexion, i.e. child predominately takes weight on forefoot with each step.

5.13 Walks

Observe the child's ability to walk and run forward. Running is defined as forward progression with both feet off the floor at one time.

6 - Child walks fast or appears to run with the ability to start, turn, and stop with no hesitation; arms are down at side and may be moving reciprocally.

5 - Child walks with the ability to **start, turn, and stop** with minimal or no hesitation; arms **slightly away** from side as if for balance.

4 - Child walks slowly; gait may be unstable and is often broad based; arms may be held stiffly; shoulders may be abducted and externally rotated (high-guard posture).

3 - Child takes at least two independent unstable steps across a gap between two people or two pieces of furniture.

2 - Child takes steps with **one hand held.**

1 - Child takes steps with **both hands**

held. 0 - Child **does not take steps**.

Caution: Child alternates between dorsiflexion and plantarflexion of the ankles when walking, but is predominately in plantarflexion, i.e. child predominately takes weight on forefoot with each step.

Caution: Child predominately takes weight on one lower extremity. Score lower extremity which is not the major weight bearing lowerextremity.

5.14 Steps up 1 to 2 inch step

Mat may be used. Score leading leg.

2 - Child is able to walk up a **1 to 2 inch step with no hesitation.**

1 - Child is able to walk up a 1 to 2 inch step with hesitation but does not fall.

0 - Child does not walk up a 1 to 2 inch step.

5.15 Steps down 1 to 2 inch step

Mat may be used. Score trailing leg.

2 - Child is able to walk down a 1 to 2 inch step **with no hesitation**.

1 - Child is able to walk down a 1 to 2 inch step **with hesitation but does not fall**.

0 - Child does not walk down a 1 to 2 inch step.

5.16 Climbs Up On High Flat Surface

Climbing is scored as "1" when the knee of the child's leading leg is at the height of the child's waist.

1 - Child climbs up.

0 - Child does not climb up.

5.17 Climbs Down From High Flat Surface

1 - Child climbs down without falling.

0 - Child does not climb down.

5.18 Jumps Clearing Floor

3 - Child jumps off floor with **forward movement**.

2 - Child jumps off floor but **does not move forward**.

1 - Child attempts to jump off floor but does not clear floor. Child sometimes leads with one foot.

0 - Child does not attempt to jump.

5.19 Kicks

Score weightbearing leg.

This is considered an assessment of balance.

3 - Child kicks ball with preparatory backward swing of leg.

2 - Child stands behind ball and kicks ball with minimal swing of leg.

1 - Child attempts to kick ball but instead bumps into and nudges it with either leg.

0 - Child does not attempt to kick ball.

5.20 Ascends Stairs

5 - Child walks up stairs **without holding rail** and places **one foot on each stair, i.e. alternating steps.**

4 - Child walks up stairs **without holding rail** and places **two feet** on each stair. (Score leading leg.) 3 - Child walks up stairs, **holds rail**, and places **one foot** on each stair, i.e. alternating steps.

2 - Child walks up stairs, **holds rail**, and places **two feet** on each stair. (Score leading leg.)

1 - Child **crawls** up or ascends any way other than standing on feet.

0 - Child does not climb stairs.

5.21 Descends Stairs.

5 - Child walks down stairs **without holding rail** and places **one foot on each stair, i.e. alternating steps.**

4 - Child walks down stairs **without holding rail** and places **two feet** on each stair. (Score trailing leg.)

3 - Child walks **down** stairs, **holds rail**, and places one foot on each stair, i.e. alternating steps.

2 - Child walks down stairs, **holds rail**, and places **two feet** on each stair. (Score trailing leg.)

1 - Child may crawl down, slide down or descend any way other than standing on feet.

0 - Child does not descend step or stairs.

6.0 Primitive Reactions

This section assesses primitive reactions which are normally present for brief periods of time during infant development. When primitive reactions are retained, the child may have difficulty performing functional movements which are incompatible with the primitivereactions.

The highest score is given when the reaction is not seen. The lowest score is given when the reaction pattern is seen repeatedly throughout the assessment.

The MAC is intended to examine functional movement. When an examiner has concerns about the functional movement of a child, the assessment of primitive reactions may help to identify a source of movement dysfunction and facilitate the structuring of treatment.

6.1 Tonic Labyrinthine Reaction in Supine (TLR-Supine)

The TLR-Supine is assessed by observing the child's posture and movements in supine and the child's response to handling.

Observe the child's posture and movements in supine. Arching of the neck and retraction of the shoulder girdle indicates the presence of the TLR-Supine. Extension of the trunk and lower extremities may be present. The TLR-Supine should not be confused with the voluntary "bridging" activity of a child who extends hips and pushes up on heels.

Test for the TLR-Supine **only** if there is need for clarification or confirmation of observations.

To test for the TLR-Supine place the child in supine with feet toward examiner. Gently move the child's head, shoulders, and hips up against gravity. If the child does not have the TLR-Supine, the neck, shoulders, and hips can be flexed withoutresistance.

- Cradle the child's head in your hands. Lift the head forward so that the neck is flexed, bringing the chin toward the chest, while shoulders remain on the supporting surface. Note resistance in the neck extensors.
- Place your hands at the back of the child's shoulders. Bring the shoulders forward. Note the presence of shoulder girdle retraction.
- Place your hands under the child's buttocks. Lift the hips and bring the knees towards chest. Note the resistance in back or hip extensors.

  2 - Arching of the neck is not observed; the neck is flat against the surface. Retraction of shoulder girdle or resistance to flexion of the neck, back, or hips is not observed or felt.

  1 - Arching of the neck and/or retraction of the shoulder girdle is observed during spontaneous movement. When testing, retraction of shoulder girdle or resistance to flexion of the neck, back, or hips may be felt.

  0 - Arching of the neck, retraction of the shoulder girdle, and extension of the trunk dominate the child's movement. The ankles may be plantarflexed.

6.2 Tonic Labyrinthine Reaction in Prone (TLR-Prone)

The TLR-Prone is assessed by observing the child's posture and movements in prone and the child's response to handling.

Observe the child's posture and movements in prone. Flexion of the neck with protraction of the shoulder girdle, head and trunk pulled down into a flexed position, and flexion of the upper and lower extremities indicates the presence of the TLR – Prone. Be careful to distinguish between influence of the TLR-Prone and the normal flexed posture of a newborn. A normal newborn lifts the head.

Test for the TLR-Prone **only** if there is need for clarification or confirmation of observations.

To test for the TLR-Prone, place the child in prone with feet toward examiner. Gently lift the child's head and shoulders and feel for resistance. If the child cannot actively extend because of low muscle tone or immature development, give the highest score.

2 - Head and shoulder girdle are **not pulled** into a flexed position. Resistance to passive lifting of head and shoulders is not felt.

1 - Flexion of the head and shoulder girdle is observed during spontaneous movement, but child can actively lift head. When testing, resistance to passive lifting of the head and shoulder girdle may be felt.

0 - Head, trunk, and extremities **are pulled** into a flexed position which the child cannot actively overcome. Child's arms usually are caught under the body.

Caution: Child's tone is too low to demonstrate reaction.

6.3 Asymmetrical Tonic Neck Reaction-Spontaneous (ATNR-Spontaneous)

The ATNR-Spontaneous is assessed by observing the child's movement throughout the evaluation.

Observe spontaneous movement when the child actively rotates head approximately 80°. Use any visual or auditory stimulus to encourage the child to rotate head. Extension of the arm and leg on the face side and flexion of the arm and leg on the skull side indicate the presence of the ATNR-Spontaneous. This posture is often described as the fencing position.

Score the ATNR by the response of the **upper extremities** to head turning. Score this skill with reference to the face side. For example, when the face is turned to the child's right, the response is recorded as an ATNR on the right.

2 - The fencing position is not observed when the child turns head to the side.

1 - The fencing position is observed in both upper extremities less than half the time when child turns head to the side

0 - The fencing position is observed in both upper extremities most of the time when child turns head to the side.

6.4 Neonatal Positive Support (NPS)

The NPS is assessed when the child is held in a vertical position facing away from the examiner and gently lowered toward a firm surface. Observe the response of the lower extremities to pressure on the balls of the feet. Stiffening into extension of the lower extremities indicates the presence of the neonatal positive support reaction. Mature weightbearing in supported standing is supple as compared to the rigid quality of the positive support reaction. If child exhibits astasia, i.e. absence of weightbearing, or takes minimal weight on feet, give the highest score and document the caution on astasia.

2 - The neonatal positive support reaction is not elicited. Typically the child sustains weight on relaxed legs with alternating flexion and extension of hips, knees, and ankles. If child does not bear weight, score two and a caution.

1 - Child stands with knees in extension with heels down on the supporting surface. Child may bear weight on toes with ankles in plantarflexion but resumes standing with heels down on the supporting surface. Legs appear stiff in weightbearing.

0 - Child stands with persistent and marked extension of the lower extremities i.e. extended hips and knees, plantar flexion of ankles, and weightbearing on toes.

Caution: Child exhibits astasia, i.e. absence of weightbearing.

Caution: Child alternates between dorsiflexion and plantarflexion of the ankles, but is predominately in plantarflexion.

6.5 Symmetrical Tonic Neck Reaction-Spontaneous (STNR-Spontaneous)

The STNR-Spontaneous is assessed by observing the child's spontaneous movement when in prone.

Observe the child's spontaneous movement in prone, especially when the child is actively weightbearing on shoulders, coming to sit, and attempting prone progression. Use any visual or auditory stimulus to encourage the child to use active neck extension or flexion. The lower extremities flex when the child's neck extends, and the lower extremities extend when the child's neck flexes. **Score** this skill by observing responses of **the lower extremities** to extension and flexion of the neck. There is also an upper extremity response to the child's neck position but this response is not scored on this assessment.

2 - The STNR is not observed when the neck is extended or flexed.

1 - The STNR is observed as an increase in flexion at the hips when the neck is extended and/or an increase in extension of the hips when the neck is flexed.

0 - The STNR is observed as total flexion of the lower extremities when the neck is extended and/or total extension of the lower extremities when the neck is flexed.

7.0 Muscle Tone

In this assessment, muscle tone (tone) refers to the degree of tension in muscles at rest and when active. The Movement Assessment of Children is intended to examine functional movement. When an examiner has concerns about the functional movement of a child, the assessment of tone may help to identify one source of movement dysfunction and facilitate the structuring of treatment. Tone that differs from the normal may be indicative of neuromotor impairment.

The first objective in assessing tone is to detect any deviation from normal that interferes with functional movement. Assessment of tone is done by observing movement, testing extensibility and identifying specific types of muscle tone.

Assessment of Muscle Tone

Observations of Muscle Tone: The examiner evaluates tone by observing the child's spontaneous movement in three positions: supine, prone, and prone suspension. Tone is considered to be normal when functional movement is characterized by **movement against gravity, a variety of movement patterns, frequent active movements, differentiation of movements between the two sides of the body, and combinations of flexion and extension occurring simultaneously within an individual extremity,** such as ankle dorsiflexion with knee extension. When functional movement is characterized by a limited variety of movement patterns, infrequent active movement, a decrease in differentiation of movements between the two sides of the body, and predominance of simultaneous flexion or extension of all joints of an ex- tremity, tone is considered to be high, low or fluctuating.

Muscle Extensibility: Muscle tone can also be evaluated by testing muscle extensibility. Extensibility refers to the capacity of a muscle to elongate when an extremity is moved slowly through a full range of motion. Extensibility also refers to muscle response to a quick stretch. Extensibility is assessed by the amount of range of motion achieved and by the resistance encountered as the examiner moves the extremity through the available range of motion and then imposes a series of quick stretches on the muscles being elongated. The muscle groups tested are hip adductors, ankle plantarflexors, and muscles of the shoulder girdle that elongate when the arm is brought to an overhead position. Precise amounts in degrees of motion are not required since the purpose of this skill is to evaluate the quality of the underlying tone and not to measure joint range of motion.

If tone is high, mobility at the joints is limited. Resistance to movement may be reduced by performing the movement gradually and slowly and may be increased when a quick stretch is applied. If tone is low, mobility at joints exceeds expectations of typical range. If tone is fluctuating, initial resistance to movement responds to prolonged stretch by allowing near normal joint range.

Type of Muscle Tone: If tone is **high**, movements appear slow and stiff and the variety of movements is diminished. In supine, the child tends to lie in an overly extended or asymmetrical posture. In prone, the child tends to lie in a flexed posture and sometimes in an overly extended posture. In prone suspension, the child is pulled down over the examiners hands or exhibits an overly extended posture. Extremities may move in total flexion and/or extension patterns.

Isf tone is **low**, the child often lies flat against the supporting surface in supine and prone. In prone suspension the child collapses or drapes over the examiner's hands. Child has difficulty achieving and maintaining postures of the trunk and positions of the extremities that combine flexion and extension. If tone **fluctuates** (athetoid), the child will show patterns of movement associated with both high and low tone. At rest child frequently appears to have low tone, which quickly changes to high tone patterns when the child initiates movement.

Scoring Muscle Tone: On skills 7.1, 7.2, and 7.3 the child receives the highest score, a score of "3" for tone, if the examiner does not have concerns about functional movement. When functional movement appears typical, though delayed or disorganized the child receives a "2". Functional movement which appears **compromised by tone** or **functional movement is not seen**, the child receives a score of "1" or "0". (See 7.1, 7.2, and 7.3 below.)

Differences in tone between left and right sides (**asymmetry**) scores are recorded in appropriate columns on the score sheet for skills 7.1, 7.2, and 7.4. Differences between upper and lower extremities (**distribution variations**) are noted when there is a difference in scores between skills 7.1, 7.2, and 7.4. See Score sheet for muscle tone.

7.1 Muscle Tone – *Upper Extremities*

3 - Tone supports functional movement.

2 - Tone supports functional movement that is typical in appearance, but minimally delayed and/or disorganized at this time.

1 - Tone allows for some functional movement, but decreased, increased, or fluctuating tone compromises the movement.

0 - Tone is too low, too high, or fluctuates too much to permit functional movement.

7.2 Muscle Tone – *Lower Extremities*

3 - Tone supports functional movement.

2 - Tone supports functional movement that is typical in appearance, but minimally delayed and/or disorganized at this time.

1 - Tone allows for some functional movement, but decreased, increased, or fluctuating tone compromises the movement.

0 - Tone is too low, too high, or fluctuates too much to permit functional movement.

7.3 Muscle Tone – *Trunk*

3 - Tone supports functional movement.

2 - Tone supports functional movement that is typical in appearance, but minimally delayed and/or disorganized at this time.

1 - Tone allows for some functional movement, but decreased, increased, or fluctuating tone compromises the movement.

0 - Tone is too low, too high, or fluctuates too much to permit functional movement.

7.4 Type of Muscle Tone*

N - Tone appears to be normal.

H - Tone appears to be high.

L - Tone appears to be low.

F - Tone appears to fluctuate.

*The scores for 7.4 are nominal; they name the type of tone.

Bibliography

Bibliography

Manuals – MAI and the First and Second Editions of MAC

Chandler, L. S., Andrews, M. S., Swanson, M. W. & Larsen, A. H. (1980). Movement Assessment of Infants: A Manual. Rolling Bay, Washington: Infant Movement Research.

Chandler, L. S., Andrews, M. S., & Swanson, M. W. (1983). Movement Assessment of Infants - Screening Test Rolling Bay, Washington: Infant Movement Research.

Chandler, L. S., Andrews, M. S., & Swanson, M. W. (1999). Movement Assessment of Infants - Screening Test. (von Steiger, A., Trans. German and French) Bern, Switzerland. (The original manual was published in 1983.)

Chandler, L. S., Andrews, M. S., & Swanson, M. W. (2006). Movement Assessment of Children: A Manual. Rolling Bay, Washington: Infant Movement Research.

Chandler, L. S., Andrews, M. S., & Swanson, M. W. (2012). Movement Assessment of Children: A Manual. 1515 Dock Street, Box 406, Tacoma, WA 98402.

Referenced Journals

Chandler, L.S. (1986). Screening for movement dysfunction in infancy. In J. Sweeney (Ed) The High Risk Newborn: Developmental Therapy Perspectives. Physical and Occupational Therapy in Pediatrics. 6,171-187.

Einarsson-Backes, L. M. & Stewart, K. B. (1992) Infant neuromotor assessments: a review and review of selected instruments. The American Journal of Occupational Therapy. 46(3) 224-232.

Solomon, M., Orlin, M., Morrissey, K., Cockerill, M. (1996) Motor performance of infants born prematurely: A comparison at age six months of those exposed and not exposed to cocaine. Pediatric Physical Therapy, 8, 80-86.

Chapters

Chandler, L. S. (1990). Neuromotor Assessment. In E. D. Gibbs & D. M. Teti (Eds.) Interdisciplinary Assessment of Infants: A Guide for Early Intervention Professionals. Baltimore, MD: P. H. Brookes.

Abstracts/ Posters

Breznik, T. (Spring, 2000). Neurophysiotherapist's Assessment of Sensorimotor Development of Children: Selecting and Testing the Assessment Tool. Abstract presented to University of Ljubljana, Slovenia.

Chandler, L. S., Adams, M.A., Schuhmann, K. & Todd, J. R. (February 1999). Effects of Neurodevelopmental Treatment (NDT/Bobath) on the Movement of Children with Cerebral Palsy as Measured by the Movement Assessment of Infants. Poster presented at the CSM – APTA Conference.

Peer-Reviewed Presentation

Chandler, L.S., Adams, M.A., Arndt, S.L., Andrews, M.S., McElroy, J.L., Wiggin, M.M., Chapman, B. (February 13, 2003). Outcomes of Short-Term Neurodevelopmental Treatment for children with Cerebral Palsy and Developmental Delay. American Physical Therapy Association Combined Sections Meeting, Tampa, Florida.

Chandler, L.S. & Andrews, M.S. (May 2001). Outcomes of Short-Term Neurodevelopmental Treatment for Children with Cerebral Palsy. Paper presented at the AOTA Annual Conference Philadelphia, PA.

Student Presentation

Link, A., Morgan, R., Rodman, W., Talbot, S. (2011). The Influence of Gross Motor Skills on the Development of Gait in Typically Developing Infants; a longitudinal pilot study. Paper presented at Research Symposium, University of Puget Sound.

Unpublished Data

Chandler, L.S., Andrews, M.S., Arndt, S.L., McElroy, J.J., Wiggin, M.M., (2003). Neuro-developmental treatment versus parent-infant playgroup for infants with posture and movement dysfunction.

Dissertation:

Chandler, L.S. (1983). The effectiveness of microtraining in teaching infant movement assessment. University of Washington, Seattle, WA.

Appendix

Appendix
Calculation of Age

1) To calculate a child's age write the date of the exam above the date of birth. Write years, then months, then days. Subtract date of birth from date of exam.

2) To borrow a month of days, 30 days is always used. To borrow a year of months, 12 is always used.

Example One:
The child to be assessed was born on September 30, 2005. The MAC is to be completed October 25, 2006. On the day of testing this child is 1 year 25 days old.

Date of Exam	2006	10	25
Date of Birth	2005	9	30
Age	1	0	25

3) If a child is born prematurely, subtract the gestational age from 40 weeks (the average gestational age). Multiply the number of weeks of prematurity by 7. Subtract the number of days from the child's age.

Example Two:
If the child in example one had been born at 30 weeks gestation; the child would be 10 months 15 days old on the day oftesting.

Gestational Age 30 weeks
40 - 30 = 10 weeks early
10 x 7 = 70 days early

The child in example 1 is 1 year 25 days old or 12 months 25 days old. Subtract 70 days.

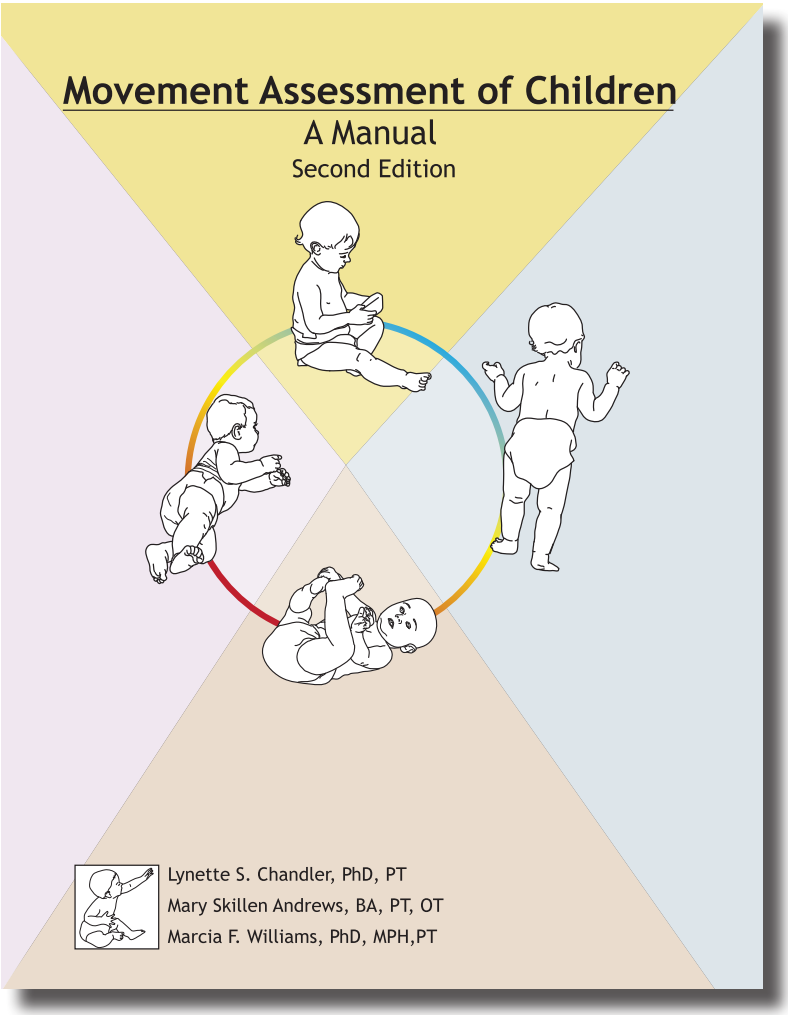
Age	12	25
Days of prematurity		70
Corrected Age	10	15

4) Ages used in recording test scores are in months. The child's age is rounded to the nearest month. The cut point is between 15 and 16 days. In example one above, the child would be compared to the norms for 13 month old children. In example two above, the child would be compared to the norms for 10 month oldchildren.

5) The examiner should consider the fact that a child assessed a few days earlier or later, may have been compared to a different set of norms. Professional judgment takes precedence over the rule on rounding when interpreting a child's performance.

6) Check your math on a sample child. The child to be assessed was born on December 18, 2005. The MAC is to be completed July 5, 2006. The child was born at 35 weeks gestation.

   Answer: The child would be a corrected age of 5 months 17 days and would be assessed as 6 months old.



Scoring Packet

Movement Assessment of Children

Child's Identification: _____ **Date of Birth**_____ **Child's Age:** _____

Child's Gestational Age: _____**weeks** **Child's Corrected Age:** _____

Examiner: _____

1 General Observations

1.1 **Behavioral State.**

2 Child's behavior **supports** an accurate **interpretation** of the assessment.
1 Child's behavior may compromise the interpretation of the assessment.
0 Child's behavior does not allow for an accurate interpretation of the assessment.

Behavioral State: Ideal behavioral state for an infant is "quiet alert"; infants may enter a fussy or drowsy state briefly but rapidly recovers when returned to caregiver or to a supportive position. Older child is curious and interactive; child may be cautious or shy but participates with caregiver or older sibling encouragement; child may wish to do things their way and challenge the examiner, but ultimately completes the tasks.

1.1

L & R
2
1
0

1.2 **Autonomic Nervous System Stability.**

2 Child's ANS function supports accurate assessment of motor development and allows child to participate fully throughout the assessment.
1 Child's ANS function demonstrates some instability that responds positively to special handling. This may compromise child's ability to participate fully throughout the assessment.
0 Child demonstrates persistent ANS instability that is not altered by special handling. The assessment is stopped and caregiver assisted in calling for immediate medical referral.

ANS Stability: Child maintains body temperature, has few tremors, shows minimal gastric distress, and maintains smooth movement.
Special Handling: includes but is not limited to quieting the environment, slowing examiner's pace, or wrapping child in blanket.

1.2

L & R
2
1
0

Totals for General Observations

# of C	Scores	# of A
	L & R	
NA		NA

2 Special Senses

2.1 **Visual Following.**

- **4** Child follows object with **eyes and head** through a **full range** of horizontal movement; movement is continuous. A child may occasionally be distracted, but visual attention is easily regained.
- **3** Child follows object with **eyes and head** through a **partial range** of horizontal movement. A child may occasionally be distracted; visual attention must be regained.
- **2** Child follows object with **eyes and then head** through a **partial range** of horizontal movement. A child may occasionally be distracted; visual attention must be regained.
- **1** Child occasionally focuses on object; eyes may follow object but head does not follow.
- **0** Child does not focus on object or the response is so inconsistent that interpretation is difficult.

Testing position: If possible test the child sitting in the caregiver's lap. For the younger child, this may be tested in supine; if the child has poor head centering have caregiver place child in supine on caregiver's lap, position child's head down by the caregiver's knees so that it is cradled in a slight indent between the two knees.

Object: An object can be inanimate (ball) or animate (face of caregiver or examiner).

2.1

L	R
4	4
3	3
2	2
1	1
0	0

2.2 **Peripheral Vision.**

- **2** Child turns eyes to look at object when it is at approximately 45° from midline.
- **1** Child turns eyes to look at object only when examiner brings it past 45° toward midline.
- **0** Child does not turn eyes or the response is so inconsistent that interpretation is difficult.

Testing position: If possible test the child sitting in the caregiver's lap. For the younger child, this may be tested in supine; if the child has poor head centering have caregiver place child in supine on caregiver's lap, position child's head down by the caregiver's knees so that it is cradled in a slight indent between the two knees.

Head Centering: Head aligned over shoulders; child looks forward.

Midline: With child's head centered, midline is directly over child's nose.

2.2

L	R
2	2
1	1
0	0

2.3 **Hearing Screen.**

- **3** Child turns **immediately** to sound.
- **2** Child turns to sound, but **response is delayed**.
- **1** Child stills (quiets physical activity) to sound; eye widening may be observed.
- **0** Child does not respond to sound or the response is so inconsistent that interpretation is difficult.

Stills: Child quiets physical activity as if to listen.

Eye-widening: Child opens eyes wide.

2.3

L	R
3	3
2	2
1	1
0	0

# of C	Scores		# of A
	L	R	
NA			

3 Functional Movement - Head Control

3.1 **Head Centering - Supine.**

- **2** Child is able to move head to midline and consistently maintains the head centered.
- **1** Child is able to move head to midline but **does not maintain** the head centered.
- **0** Child is unable to move head to midline.

Caution: Persistent head turning to one side. Note side to which face is turned.

Caution: Persistent lateral flexion to one side. Note side of lateral flexion.

Caution: Persistent lateral flexion to one side with head turning to opposite side, suggestive of a torticollis.

Head Centering: Head aligned over shoulders; child looks forward.

3.1	L & R
	2
	1
	0
L / R	
L / R	

3.2 **Head Balanced - Sitting.**

- **3** Child's head is upright and stable for all activities.
- **2** Child's head is upright and stable when child is held securely; head bobs when child is moved.
- **1** Child's head is upright but not stable; head bobs.
- **0** Child has little or no head control. **Caregiver or examiner must support child's head when assessing this skill.**

3.2	L & R
	3
	2
	1
	0

3.3 **Head Righting - Lateral.** - Child is held in Sitting. Score weight bearing side.

- **3** Child consistently corrects head **past midline**.
- **2** Child predominately holds head in alignment with body; child may correct head past midline.
- **1** Child does not align head with body, but holds **head in a fixed position**.
- **0** Child does not hold head in a fixed position. **Caregiver or examiner must support child's head when assessing this skill.**

3.3	L	R
	3	3
	2	2
	1	1
	0	0

3.4 **Head Righting - Extension in Prone.**

- **3** Child raises head in midline to at least 45° from the surface toward vertical and easily moves in and out of this position. Child can turn head in either direction (left or right) while maintaining extension.
- **2** Child raises head at least 45° from the surface toward vertical but cannot maintain this position. Head may not be held in midline.
- **1** Child raises head briefly clearing surface.
- **0** Child does not raise head.

Caution: Child does not raise head.

3.4	L & R
	3
	2
	1
	0
L / R	

3.5 **Head Righting – Prone Suspension.**

- **3** Child actively raises and **maintains head above or in line** with back.
- **2** Child raises head in line with back but does not maintain head in line with back.
- **1** Child does not raise head in line with back, but holds head in a fixed position.
- **0** Child does not raise head in line with back; child does not hold head in a fixed position.

Caution: Child collapses over the examiner's hands.

Caution: Child collapses over the examiner's hands alternating with overly extended posture.

3.5	L & R
	3
	2
	1
	0

# of C	Scores		# of A
	L	R	

4 Functional Movement - Upper Extremities and Hands

4.1 **Open Hands**.

- **3** Child has predominantly open hands; hand closing is purposeful.
- **2** Child may have hands open or closed. If closed, child opens hands when looking at or reaching for an object.
- **1** Child has variable finger movements (finger play); child may explore textures with hands.
- **0** Child may have hands open or closed; hand opening and closing is not purposeful; there is no "finger play"

Caution: Child predominately holds thumbs in palm (indwelling thumb).
Caution: Child has hands tightly fisted.
Caution: Child opens hands with fingers hyperextended.

Finger play: Child uses variable finger motions to explore textures, for example feeling the table top, kneading the mother's breast or moving finger foods around in hand.
Indwelling thumb: Child's thumb remains positioned in palm of hand, often with fingers closed over thumb.

4.1

	L	R
	3	3
	2	2
	1	1
	0	0
L / R		
L / R		
L / R		

4.2 **Hands to Midline - Supine.**

- **4** Child brings hands to anterior surface of knees or feet rather than midline.
- **3** Child easily brings hands to midline forming an arch away from the body.
- **2** Child can bring **hands to midline, but h**ands are held close to or resting on the body.
- **1** Child brings **hands to mouth.**
- **0** Child does not bring hands to midline or to mouth.

4.2

L	R
4	4
3	3
2	2
1	1
0	0

4.3 **Early Grasp of Object.**

- **2** Child voluntarily grasps object, holds object securely, and shakes or moves the object.
- **1** Examiner places object in child's hand. Child holds object loosely and briefly.
- **0** Examiner places object in child's hand, but the child does not hold object or examiner is unable to place object in the child's hand.

Object: Small diameter, light weight rattle is frequently used.

4.3

L	R
2	2
1	1
0	0

4.4 **Active Weight bearing on Upper Extremities.** If child is crawling on all 4s; child receives a score of 4.

- **4** Child supports self on one forearm or hand while **reaching for an object** with the other arm. Score weight bearing arm.
- **3** Child supports self on extended arms and bears weight on hands.
- **2** Child bears weight on forearms and hands with arms **forward of shoulders;** child may move arms back in line with shoulders.
- **1** Child bears weight on forearms; **elbows are typically in line with the shoulders; elbows may briefly move behind shoulders.**
- **0** Child typically has **elbows behind shoulders**.

4.4

L	R
4	4
3	3
2	2
1	1
0	0

4.5 **Reaches Out.**

3 Child reaches out promptly and directly to touch a non-moving object presented **at shoulder height, in midline and at arm's length**.

2 Child reaches out promptly and directly to touch a non-moving object presented **in midline close to the child's trunk**.

1 Child makes random movements in the direction of an object presented **in midline close to the child's trunk** but does not touch it.

0 Child does not attempt to reach for an object.

4.5

L	R
3	3
2	2
1	1
0	0

4.6 **Large Grasp with One-Inch Cube.**

3 Child **easily picks up** and **holds cube securely**.

2 Child picks up cube but has difficulty grasping the cube and may not hold cube securely.

1 Child is able to pick up cube by trapping it with both hands but cube is not held securely; examiner may hold cube in place.

0 Child does not grasp cube.

4.6

L	R
3	3
2	2
1	1
0	0

4.7 **Transfers.** Score hand which is releasing object.

3 Child transfers object from one hand to the other using voluntary release; object must not be trapped against a surface.

2 Child transfers by pulling object from one hand with the other hand; object must not be trapped against a surface.

1 Child transfers object from one hand to the other using mouth or other surface to trap object.

0 Child does not transfer object from one hand to the other.

4.7

L	R
3	3
2	2
1	1
0	0

4.8 **Bangs, Claps, and Combines.** May use any object for banging or combining.

3 Child combines objects more than one time.

2 Child claps hands together more than one time.

1 Child bangs object on table more than one time.

0 Child does not bang object, clap, nor combine objects more than one time throughout testing.

Caution: Child consistently uses only one upper extremity and hand for banging and combining. Score inactive extremity.

4.8

L	R
3	3
2	2
1	1
0	0

L / R

4.9 **Small Grasp with Finger Food.**

3 Child picks up a **piece** of the Cheerio® with **thumb and finger tip**.

2 Child picks up a **piece** of the Cheerio® with **any grasp** other than a thumb and finger tip.

1 Child picks up the **whole** Cheerio® with **any grasp**.

0 Child **cannot grasp** finger food.

4.9

L	R
3	3
2	2
1	1
0	0

4.10 **Isolates Index Finger.**

1 Child isolates index finger to explore an object or point to an object or person.
0 Child does not isolate index finger.

4.10	L	R
	1	1
	0	0

4.11 **Controlled Release.** Typically, children will use two hands to stack blocks; give credit for both hands when stacking is bilateral.

6 Child stacks **eight, nine or ten** 1 inch cubes.
5 Child stacks **six or seven** 1 inch cubes.
4 Child stacks **four or five** 1 inch cubes.
3 Child stacks **two or three** 1 inch cubes.
2 Child **gives** cube to caregiver or examiner or child **throws** cube intentionally.
1 Child hands cube to caregiver or examiner but child does not release the object.
0 Child does not intentionally attempt to release cube.
Caution: Child hyperextends fingers when releasing cube.
Caution: Child stacks cubes with only one hand. Score inactive hand.

4.11	L	R
	6	6
	5	5
	4	4
	3	3
	2	2
	1	1
	0	0
L / R		
L / R		

4.12 **Catches.**

4 Child stands with arms directly in front of body, elbows extended, palms up or facing each other. As the ball contacts hands, child secures ball against chest.
3 Child stands with arms directly in front of body, elbows extended, palms up or facing each other. As the ball contacts hands, child attempts to secure ball against chest but is unsuccessful.
2 Child stands as if to catch ball but there is no attempt to secure ball against chest.
1 Child sits with legs spread apart and knees extended; child attempts to trap or catch ball.
0 Child does not interact with ball.

4.12	L	R
	4	4
	3	3
	2	2
	1	1
	0	0

4.13 **Protective Extension - Forward.**

2 Child moves arms forward, extends elbows, and attempts to **support weight on open hands**.
1 Child moves arms forward and supports weight on fisted hands or child does not take weight on hands.
0 Child does not move arms forward.
Caution: Child supports weight on one fisted hand and one open hand. Score the fisted side.
Caution: Child moves only one arm forward. Score inactive arm.

4.13	L	R
	2	2
	1	1
	0	0
L / R		
L / R		

# of C	Scores		# of A
	L	R	

5.1 **Active Use of Lower Extremities - Supine.**

- **2** Child kicks lower extremities randomly with or without rounding buttocks off the supporting surface.
- **1** Child kicks lower extremities together.
- **0** Child shows minimal movement of lower extremities.

Caution: There is minimal movement of lower extremity(ies). Note which extremity(ies) shows minimal movement.

5.1

L	R
2	2
1	
0	0

L / R

5.2 **Trunk Centering - Supine.**

- **2** Child easily centers trunk; child maintains pelvis and shoulder girdle aligned.
- **1** Child can center trunk; child does not maintain pelvis and shoulder girdle aligned.
- **0** Child does not center trunk.

5.2

L & R
2
1
0

5.3 **Active Use of Pelvis - Supine.**

- **2** Child rounds buttocks off the supporting surface and easily moves into and out of a stable, symmetrical **posterior pelvic tilt.**
- **1** Child can round buttocks off the supporting surface but cannot move easily into and out of a symmetrical pelvic tilt.
- **0** Child does not round buttocks off the supporting surface.

5.3

L & R
2
1
0

5.4 **Back Straight - Sitting.** Child may be placed in sitting.

- **4** Child **sits independently.** Child maintains a straight back down to buttocks.
- **3** Child **sits independently**. Child can achieve but does not maintain a straight back down to buttocks.
- **2** Child **sits independently.** Child can only straighten upper back.
- **1** Child in **supported sitting** straightens upper back.
- **0** Child in **supported sitting** remains in a **round back** position.

Caution: Child **sits independently** with a posterior pelvic tilt.

Caution: Child **sits independently** or in **supported sitting** with hyperextension of neck.

5.4

L & R
4
3
2
1
0

5.5 **Incurvation of Trunk - Sitting.** Score weight bearing side.

- **3** Child exhibits incurvation of the trunk when held at the sides of the pelvis.
- **2** Child exhibits trunk incurvation when held at level of lower ribs.
- **1** Child exhibits midline trunk stability when held at level of lower ribs.
- **0** Child does not exhibit trunk incurvation and does not demonstrate midline trunk stability when held at level of lower ribs.

5.5

L	R
3	3
2	2
1	1
0	0

5.6 **Rolls Over from Supine.** Score weight bearing side.

- **5** Child rolls **independently** from supine over one side and **into sitting or partial sitting** with weight on one hip.
- **4** Child rolls **independently** from supine **to prone**.
- **3** The examiner **assists** the child in rolling. Child uses **lateral flexion of neck** to bring **head off of the surface** to complete the roll. Child may or may not free arms.
- **2** The examiner **assists** the child in rolling. Child uses **hyperextension** rather than lateral flexion of the neck in attempt to bring head off of the surface. Child has **difficulty** or is **unsuccessful** realigning the pelvis and shoulder girdle. Child may or may not free arms.
- **1** The examiner **assists** the child in rolling. Child maintains head on the surface throughout the roll. Child has difficulty or is unsuccessful realigning the pelvis and shoulder girdle. Child may or may not free arms.
- **0** The examiner **assists** the child in rolling. Child does not attempt to realign the pelvis and shoulder girdle.

Caution: Child always rolls over left or right side when rolling independently . (Score non-weight bearing side.)

Caution: Child uses upper extremities to pull trunk and lower extremities into a roll.

5.6

L	R
5	5
4	4
3	3
2	2
1	1
0	0

L / R

5.7 **Sits Independently when Placed.**

- **4** Child reaches out for an object placed just out of reach. Child grasps the object and returns to the upright position.
- **3** Child sits securely without arm support.
- **2** Child sits without using arms for support but is unstable.
- **1** Child sits by propping self with arms.
- **0** Child **does not** sit independently.

5.7

L & R
4
3
2
1
0

5.8 **Progresses in Prone.**

- **4** Child crawls forward on **hands and knees** or on hands and feet with reciprocal movement.
- **3** Child crawls forward on **abdomen** with random movement of arms and legs.
- **2** Child pivots in circular motion on abdomen for at least 1/4 turn (90°).
- **1** Child pushes on hands and may slip backward when attempting to move forward.
- **0** Child makes no progress as described above; see cautions below.

Caution: Child progresses forward in prone in a manner not described above. For example: 1- Child appears to hop forward by placing both upper extremities on surface and pulling lower extremities forward simultaneously; hips are tightly flexed; child lacks reciprocal movement of arms and legs. 2 - Child uses both arms, one knee and one foot. Score non-weight bearing side. 3 - Child progresses forward using arms only.

Caution: Child progress forward in sitting. For example: 1 - Child may hitch forward on one buttock, using one arm. Score non-weight bearing side. 2 - Child pulls self forward using leg only. Score non-weight bearing side.

5.8

L & R	
4	
3	
2	2
1	
0	

L / R

5.9 **Coming to Sit**. Score weight bearing side.

4 Child achieves sitting from supine, using partial sit-up; child rotates onto one hip, using upper extremity support to achieve sitting. Child may move directly to standing without sitting.

3 Child achieves sitting from hands and knees using rotation; child sits on one hip and rotates into sitting.

2 Child achieves a partial sitting position from hands and knees; child sits with weight on one hip using upper extremity or extremities for balance but does not rotate trunk into sitting.

1 Child assumes a "W sitting" position. Child achieves "W sitting" by symmetrically pushing into sitting.

0 Child is unable to get to a sitting or partial sitting position independently.

Caution: Child always assumes a "W sitting" position in order to come to sit. If this is the only sitting posture, "W sitting" may indicate trunk instability.

"W sitting": Child sits with hips internally rotated and flexed to 90^0, knees maximally flexed and buttocks between feet.

5.9

L	R
4	4
3	3
2	2
1	
0	0

5.10 **Comes to Stand from Floor**. *Score **leading** leg.*

7 Child stands up by moving from quadruped to half kneel to standing; child **does not use** upper extremities for stability.

6 Child stands up by moving from quadruped to half kneel to standing; child uses **upper extremities** for stability.

5 Child stands up by moving from quadruped into a **squatting or semi-squatting** position to standing; child uses **upper extremities** for stability.

4 Child stands up **using furniture for support**; child uses kneel to half-kneel movements to achieve a standing position. In the half-kneel position, the legs are well separated with hip and knee of the forward leg flexed to 90 degrees.

3 Child stands up **using furniture for support**; child comes to stand using half-kneel movements **without clear separation of legs**.

2 Child stands up **using furniture for support**; child pulls self up with arms with little or no leg separation.

1 Child kneel stands **using furniture for support**; child cannot come to stand.

0 Child does not initiate come to stand.

Caution: Child has little or no leg separation.

Caution: Child always uses left or right leg to stand. *Score leg which **does not** come forward.*

5.10

L	R
7	7
6	6
5	
4	4
3	3
2	
1	
0	0

L / R

5.11 **Gets Down to Floor.**

4 Child **squats down without holding on** and stays briefly in this position. May play in this position.

3 Child **squats down without holding on but does not maintain this position.**

2 Child squats down but must hold on to get down. The movement is controlled.

1 Child holds on to get down **using any method other than a squat.** The last tenth of the movement may lack control.

0 Child does not get down from standing.

5.11

L & R
4
3
2
1
0

5.12 **Cruises**. Score leading leg.

3 Child cruises quickly and easily.

2 Child cruises by taking at least one or two steps in one direction with full weight shift of leading lower extremity.

1 Child attempts to cruise but makes little or no progress; child sometimes appears to lead with upper extremities on supporting surface.

0 Child does not attempt to cruise.

Caution: Child alternates between dorsiflexion and plantarflexion of the ankles when cruising but is predominately in plantarflexion, i.e. child predominately takes weight on forefoot with each step.

Cruising: Walking sideways while holding on to furniture.

5.12

L	R
3	3
2	2
1	1
0	0

L / R

5.13 **Walks.**

6 Child walks fast or appears to run with the ability to start, turn, and stop with no hesitation; arms are down at side and may be moving reciprocally.

5 Child walks with the ability to **start, turn, and stop** with minimal or no hesitation; arms **slightly away** from side as if for balance.

4 Child walks slowly; gait may be unstable and is often broad based; arms may be held stiffly; shoulders may be abducted and externally rotated (high-guard posture).

3 Child takes at least two independent unstable steps across a gap between two people or two pieces of furniture.

2 Child takes steps with **one hand held**.

1 Child takes steps with **both hands held**.

0 Child **does not take steps.**

Caution: Child alternates between dorsiflexion and plantarflexion of the ankles when walking, but is predominately in plantarflexion, i.e. child predominately takes weight on forefoot with each step.

Caution: Child predominately takes weight on one lower extremity. Score lower extremity which is not the major weight bearing lower extremity.

5.13

L & R
6
5
4
3
2
1
0

L / R

L / R

5.14 **Steps up 1 to 2 inch step.** **(Mat may be used. Score leading leg.)**

2 Child is able to walk up a **1 to 2 inch step with no hesitation.**

1 Child is able to walk up a 1 to 2 inch step with hesitation but does not fall.

0 Child does not walk up a 1 to 2 inch step.

5.14

L	R
2	2
1	1
0	

5.15 **Steps down 1 to 2 inch step.** **(Mat may be used. Score trailing leg.)**

2 Child is able to walk down a 1 to 2 inch step **with no hesitation.**

1 Child is able to walk down a 1 to 2 inch step **with hesitation but does not fall.**

0 Child does not walk down a 1 to 2 inch step.

5.15

L	R
2	2
1	1
0	

5.16 **Climbs Up On High Flat Surface.**

1 Child climbs up.

0 Child does not climb up.

5.16

L & R
1
0

5.17 **Climbs Down From High Flat Surface.**

1 Child climbs down without falling.

0 Child does not climb down.

5.17

L & R
1
0

5.18 **Jumps- Clearing Floor.**

- **3** Child jumps off floor with **forward movement**.
- **2** Child jumps off floor but **does not move forward.**
- **1** Child attempts to jump off floor but does not clear floor. Child sometimes leads with one foot.
- **0** Child does not attempt to jump.

5.18

L & R
3
2
1
0

5.19 **Kicks** . (Score weightbearing leg.)

- **3** Child kicks ball with preparatory backward swing of leg.
- **2** Child stands behind ball and kicks ball with minimal swing of leg.
- **1** Child attempts to kick ball but instead bumps into and nudges it with either leg.
- **0** Child does not attempt to kick ball.

5.19

L	R
3	3
2	2
1	1
0	0

5.20 **Ascends Stairs.**

- **5** Child walks up stairs **without holding rail** and places **one foot on each stair, i.e. alternating steps.**
- **4** Child walks up stairs **without holding rail** and places **two feet** on each stair. (Score leading leg.)
- **3** Child walks up stairs, **holds rail,** and places **one foot** on each stair, i.e. alternating steps.
- **2** Child walks up stairs, **holds rail,** and places **two feet** on each stair. (Score leading leg.)
- **1** Child **crawls** up or ascends any way other than standing on feet.
- **0** Child does not climb stairs.

5.20

L	R
5	
4	4
3	
2	2
1	
0	

5.21 **Descends Stairs.**

- **5** Child walks down stairs **without holding rail** and places **one foot on each stair, i.e. alternating steps.**
- **4** Child walks down stairs **without holding rail** and places **two feet** on each stair. (Score trailing leg.)
- **3** Child walks **down** stairs, **holds rail,** and places one foot on each stair, i.e. alternating steps.
- **2** Child walks down stairs, **holds rail**, and places **two feet** on each stair. (Score trailing leg.)
- **1** Child may crawl down, slide down or descend any way other than standing on feet.
- **0** Child does not descend step or stairs.

5.21

L	R
5	
4	4
3	
2	2
1	
0	

# of C	Scores		# of A
	L	R	

6 Primitive Reactions

6.1 **Tonic Labyrinthine Reaction in Supine (TLR - Supine).**

- **2** Arching of the neck is not observed; the neck is flat against the surface. Retraction of shoulder girdle or resistance to flexion of the neck, back, or hips is not observed or felt.
- **1** Arching of the neck and/or retraction of the shoulder girdle is observed during spontaneous movement. When testing, retraction of shoulder girdle or resistance to flexion of the neck, back, or hips may be felt.
- **0** Arching of the neck, retraction of the shoulder girdle, and extension of the trunk dominate the child's movement. The ankles may be plantarflexed.

6.1

L & R
2
1
0

6.2 **Tonic Labyrinthine Reaction in Prone (TLR - Prone).**

- **2** Head and shoulder girdle are not **pulled** into a flexed position. Resistance to passive lifting of head and shoulders is not felt.
- **1** Flexion of the head and shoulder girdle is observed during spontaneous movement but child can actively lift head. When testing, resistance to passive lifting of the head and shoulder girdle may be felt.
- **0** Head, trunk, and extremities are pulled into a flexed position which the child cannot actively overcome. Child's arms usually are caught under the body.

Caution: Child's tone is too low to demonstrate reaction.

6.2

L & R
2
1
0

6.3 **Asymmetrical Tonic Neck Reaction - Spontaneous (ATNR-Spontaneous).**

- **2** The fencing position is not observed when the child turns head to the side.
- **1** The fencing position is observed in both upper extremities less than half the time when child turns head to the side.
- **0** The fencing position is observed in both upper extremities most of the time when child turns head to the side.

6.3

L	R
2	2
1	1
0	0

6.4 **Neonatal Positive Support.**

- **2** The neonatal positive support reaction is not elicited. Typically the child sustains weight on relaxed legs with alternating flexion and extension of hips, knees, and ankles. If child does not bear weight score two and a caution.
- **1** Child stands with knees in extension with heels down on the supporting surface. Child may bear weight on toes with ankles in plantarflexion but resumes standing with heels down on the supporting surface. Legs appear stiff in weightbearing.
- **0** Child stands with persistent and marked extension of the lower extremities, i.e., extended hips and knees, plantar flexion of ankles, and weight bearing on toes.

Caution: Child exhibits astasia, i.e., absence of weight bearing.

Caution: Child alternates between dorsiflexion and plantarflexion of the ankles, but is predominately in plantarflexion.

6.4

L	R
2	2
1	1
0	0

L / R

6.5 **Symmetrical Tonic Neck Reaction - Spontaneous (STNR-Spontaneous).**

- **2** The STNR is not observed when the neck is extended or flexed.
- **1** The STNR is observed as an increase in flexion at the hips when the neck is extended and/or an increase in extension of the hips when the neck is flexed.
- **0** The STNR is observed as total flexion of the lower extremities when the neck is extended and/or total extension of the lower extremities when the neck is flexed.

6.5

L & R
2
1
0

# of C	Scores		# of A
	L	R	

7 Muscle Tone

7.1 **Muscle Tone - Upper Extremities.**

- **3** Tone supports functional movement.
- **2** Tone supports functional movement that is typical in appearance, but minimally delayed and/or disorganized at this time.
- **1** Tone allows for some functional movement, but **decreased, increased, or fluctuating** tone compromises the movement.
- **0** Tone is too low, too high, or fluctuates too much to permit functional movement.

7.1

L	R
3	3
2	2
1	1
0	0

7.2 **Muscle Tone - Lower Extremities.**

- **3** Tone supports functional movement.
- **2** Tone supports functional movement that is typical in appearance, but minimally delayed and/or disorganized at this time.
- **1** Tone allows for some functional movement, but **decreased, increased, or fluctuating** tone compromises the movement.
- **0** Tone is too low, too high, or fluctuates too much to permit functional movement.

7.2

L	R
3	3
2	2
1	1
0	0

7.3 **Muscle Tone -Trunk.**

- **3** Tone supports functional movement.
- **2** Tone supports functional movement that is typical in appearance, but minimally delayed and/or disorganized at this time.
- **1** Tone allows for some functional movement, but **decreased, increased, or fluctuating** tone compromises the movement.
- **0** Tone is too low, too high, or fluctuates too much to permit functional movement.

7.3

L	R
3	3
2	2
1	1
0	0

Scores		# of A
L	R	

7.4 **Type of Tone.***

- **N** Tone appears to be normal.
- **H** Tone appears to be high.
- **L** Tone appears to be low.
- **F** Tone appears to fluctuate.

*These scores are nominal, they name the type of tone.

UE		LE		Trunk
L	R	L	R	

Direct questions to:
Lynette S. Chandler
e-mail: lynettemac1@mac.com