IX. BAYLEY PROTOCOL

A. Overview

Global markers of child development will be assessed using the Bayley Scales of Infant Development (BSID) revised by The Psychological Corporation (1992).

The revision process for the Bayley has taken several years and included establishing new normative standards for the test using a representative sample of 1,700 children; expanding constant coverage of the test; revision of the structure and content of The Infant Behavior Record (now called "Behavior Rating Scale": BRS) so that the scale has an objective scoring system; psychometric improvement in score sensitivity and construct validity; and enhancement of clinical validity of the test to take into account its' usage with children who may be at risk or suspected of being at risk for impaired development.

The Bayley II Scales:

1. **Mental Scale** assesses sensory-perceptual acuity, discriminations, and the ability to respond to these; object constancy and memory; learning and problem solving; and verbal ability, generalization, and classification (the basis of abstract thinking).

2. **Motor Scale** which assesses muscle control (control of the body), and large and fine motor coordination.

3. **Behavior Rating Scale (BRS)** which assesses attitude, interest, emotion, energy, activity, and response to stimuli.

B. Examiners Preparation for Bayley Training

Examiners should begin preparation for Bayley training sessions three months in advance. The following steps should be taken:

Read the manual several times, paying special attention to the instructions for administering items. It is especially important that examiners be thoroughly familiar with how items are administered and scored and use the cue sheet and record forms (found in the back of the Bayley manual). Further attention regarding rapport with children and the general principles on which the Bayley was constructed are available in the earlier version of the Bayley manual, and should be read by new examiners.

In preparation for performing a Bayley II at 44 weeks (1 month) PCA infant, a new examiner should observe a trained examiner administer a Bayley to a 1 to 3 month old child.

In preparation for performing a Bayley II at 56 weeks (4 month) PCA infant, a new examiner should observe a trained examiner administer a Bayley to a 3 to 5 month old child.

In preparation for performing a Bayley II at 92 weeks (1 year) PCA infant, a new examiner should observe a trained examiner administer a Bayley to a 9 to 15 month old child.

Reliability of BAYLEY II Testing for CHIME Study:
Every person performing the Bayley II for the CHIME study will be required to view and score a Bayley II video tape assessment provided for an infant at 12 months of age. All Bayley Assessment personnel should obtain a **.79** reliability on **Motor** and **.8 - .9** reliability on **Mental**.

Bayley Training Location	Sites Present	Date of Training
Cleveland, Ohio	Cleveland, Chicago, Toledo	6/27/93
Los Angeles, CA	Los Angeles, Honolulu	7/10/93

C. Scheduling

At 44, 56 and 92 weeks PCA infant development will be assessed using the Bayley Scales of Infant Development (BSID), revised 1992 version. Every effort must be made to administer the age appropriate developmental assessment according to the infant's correct '**Bayley age**'.

CHIME Medical Follow-up Visit (PCA in Weeks)	Bayley Age (in months & days)	Bayley Exam to Administer
44 weeks	16 days - 1 month 15 days	1 month
56 weeks	3 months 16 days - 4 months 15 days	4 months
92 weeks	11 months 16 days - 12 months 15 days	12 months

D. Determining Bayley Age for Testing

1. **Prior to testing**, the Coordinator must provide the infant's gestational age at birth (from **Form C**) to Bayley Examiners (for details on determining GA at Birth for CHIME see **Section II-7**). Examiners should not obtain gestational age at birth by interviewing caregivers at the time of testing. It is critical to standardize the calculation of Corrected age (in months & days) for the Bayley exam. Therefore, the **Gestational Age Conversion** chart must be used by the examiner to calculate the adjustment for prematurity or post-maturity. Prior to testing, the Examiner must complete the boxes in the upper right hand corner of the Bayley Scoring form. Write in the Date of Testing, Date of Birth and calculate the infant's Chronological Age.

2. **Adjustment for Prematurity**

For infants whose gestational age at birth was 25-40 weeks, Examiners must use the gestational age at birth (in weeks) that was provided by the Study Coordinator to find the corresponding age in months and days as it appears in the **Gestational Age Conversion** chart under **Adjustment for Prematurity**. On the Bayley Scoring form under the Adjustment for Prematurity, write in this age. This Adjustment for Prematurity is subtracted from the infant's Chronological Age. When subtracting days in the calculation of Corrected or Chronological Age, assume a 30 day month.

EXAMPLE #1

	YEAR	MONTH	DAY	
Date of Testing:	94	12	9	
Date of Birth:	94	9	25	
Chronological Age	0	2	14	
Adj for Prematurity:		1	18	**Gestational Age at Birth :** 33 wks (Refer to Gestational Age Conversion cht)
Corrected Age:	**0**	**0**	**26**	

EXAMPLE #2

	YEAR	MONTH	DAY	
Date of Testing:	94	11	7	
Date of Birth:	93	8	21	
Chronological Age	1	2	16	
Adj for Prematurity:		2	2	**Gestational Age at Birth :** 31 wks (Refer to Gestational Age Conversion cht)
Corrected Age:	**1**	**0**	**14**	

EXAMPLE #3

	YEAR	MONTH	DAY	
Date of Testing:	94	11	20	
Date of Birth:	94	10	10	
Chronological Age	0	1	10	
Adj for Prematurity:		0	14	**Gestational Age at Birth :** 38 wks (Refer to Gestational Age Conversion cht)
Corrected Age:	**0**	**0**	**26**	

3. **Adjustment for Post-maturity**
   For those infants' whose gestational age at birth was 41-42 weeks, Examiners must use the gestational age at birth (in weeks) that was provided by the Study Coordinator to find the corresponding age in months and days as it appears in the **Gestational Age Conversion** chart under **Adjustment for Post-maturity**. On the Bayley Scoring form under the Adjustment for Prematurity (Post-maturity), write in this age. This Adjustment for Post-maturity is <u>added</u> to the infant's Chronological Age.

EXAMPLE #4

	YEAR	MONTH	DAY	
Date of Testing:	94	10	18	
Date of Birth:	94	9	10	
Chronological Age	0	1	8	
Adj for Prematurity:		0	14	**Gestational Age at Birth :** 42 wks (Refer to Gestational Age Conversion cht)
Corrected Age:	**0**	**1**	**22**	

EXAMPLE #5

	YEAR	MONTH	DAY	
Date of Testing:	95	8	11	
Date of Birth:	94	9	15	
Chronological Age	0	11	26	
Adj for Prematurity:		0	7	**Gestational Age at Birth :** 41 wks (Refer to Gestational Age Conversion cht)
Corrected Age:	**1**	**0**	**3**	

GESTATIONAL AGE CONVERSION
FROM WEEKS TO MONTHS & DAYS

Adjustment for Prematurity

Gestational Age at Birth in weeks	Gestational Age at Birth in	
	Month (s)	Day(s)
25	3	14
26	3	7
27	3	0
28	2	23
29	2	16
30	2	9
31	2	2
32	1	25
33	1	18
34	1	12
35	1	5
36	0	28
37	0	21
38	0	14
39	0	7
40	0	0

Adjustment for Post-maturity

Gestational Age at Birth in weeks	Gestational Age at Birth in	
	Month (s)	Day(s)
41	0	7
42	0	14

E. Testing Situation

Generally, testing requires an environment free from distractions. The testing room should be quiet, well lit, and well ventilated. Avoid overhead lighting that shines directly in the infant's eyes and minimize distractions that might interfere with the child's performance.

The room should be large enough to administer the exam. A padded surface at least 2 feet by 4 feet (i.e. an exam table, an open crib, or a clean mat placed on the floor) provides the optimal surface for testing a young child. For a complete description of the appropriate physical environment, refer to Chapter 2 of the Bayley Administration Manual.

If a child becomes extremely fussy or is unable to be settled, the Bayley II can be given in other situations. Try these in this order:

(1) child seated on mother's lap at the adult-height table;
(2) child seated in a child-sized chair at a child-sized table, with the mother and examiner also at child height; and
(3) on the floor.

F. Explaining the Bayley to the Mother/Caregiver

Prior to beginning the Bayley, it is necessary to explain what will happen to the mother so she knows what is expected of her in the testing situation. It is recommended that the explanation be given before the actual testing situation.

The beginning of the testing situation is an important one in establishing rapport between tester and child; testers who must divert their attention to the mother at this point are likely to lose the child's interest and attention. A suggested script for introducing the Bayley follows:

> *"Some of the things I give her will be too easy, some will be too hard, and some will be just right. Please try not to talk to your child while we're doing this because I want her to pay attention to me. This may be hard for you, especially if she doesn't do some things you know she can do, or if she surprises you by doing some new things. I think you will really enjoy watching this part of the visit."*

Encouraging mother/caregiver participation in the assessment is **NOT** recommended (please refer to the Bayley Manual for more details).

If a mother or caregiver is intrusive or tries to interact with the tester or the child, the tester should repeat the instructions already given. A tester might say:

"I need to have CHILD pay attention to me. I'll let you know when to help. Otherwise, I'd appreciate your not talking right now."

G. Items to Present

Suggestions for the order in which to present items to children are recommended in the Bayley Manual, in addition to the published "cue sheets". Tester must remain flexible in their selection of items. Examiners may develop an order of presentation of items that works well for them, as long as easier and more difficult items are interspersed throughout the test.

H. Maintaining Child Involvement

The pace at which the tester presents items to the child is important in maintaining the child's interest and involvement. This pace should be adjusted to the individual child, but in general must be more rapid than an "ideal" interaction between an adult and child. Testers should remember that the Bayley is not an opportunity for children to explore materials, but an assessment of the child's developmental status. It is better to move to the next item **before** the child is tired of the current one. If the child protests, he or she can maintain possession of one toy while the tester presents the next, and once his or her attention has shifted to the new toy, the tester can gently remove the previous one from his or her hand. Items that are timed or that may require the child to use both hands should not be presented until the previous material are removed.

If a child seems to be getting frustrated, it may be helpful to give him or her an attractive material to manipulate and explore for a minute or two before going on to the next item. The bell is sometimes attractive to children, as is the book. Testers must remember that this takes time, however. A better strategy is to alternate easy and difficult items to maintain the child's involvement.

Enthusiasm on the tester's part is also important. Your positive affect and emotional involvement are contagious. It is especially crucial that the tester's enthusiasm not vary with the child's success on particular tasks. Thus, the tester must be just as likely to say "Good job" or "Nice work" when the child fails an item as when the child succeeds, as long as the child's attempts are directed toward the task. If the tester is not able to do this, he or she should avoid using these phrases. In all cases, praise should be kept general and not include specific feedback. Avoid saying, "You've stacked five of them" or even "That's right". Instead, focus on the child's effort of the attractiveness of the materials: "Great try" or "This is fun" or "You're working hard".

Sensitivity to the child also means that testers have to make decisions about removing materials when the child is finished with them. It is important, however, that testers not interrupt a child in the midst of completing a task, or take materials away without giving a child an opportunity to pass an item.

Testers should be thoroughly familiar with the criteria for each item so that items can be abbreviated if the child either passes the item before all parts have been presented or fails

on part of a multi-part item on which all parts must be passed for credit.

I. Scoring the Bayley

On the face sheet of the Bayley score sheet, record **only** the following items:

- infant's Study Id number
- tester's Id number and name
- test date
- birth date
- infant's age: chronological, adjustment for prematurity/postmaturity (in months and days) and corrected age
- time of day test begins and ends (including a.m. or p.m.)

Record the child's performance on each appropriate item in the column labeled **Scoring**. To convert raw scores for the MDI and PDI to index scores, turn to the appropriate page of Appendix A in the Bayley manual. The child's age in years, months and days determines which page of the table should be used. Each page provides the index scores for the age span noted in the box at the top of the page. Find the raw score under the appropriate heading (Mental or Psychomotor). Then, reading across from the raw score to the extreme right or extreme left column, find the equivalent index score for each scale.

If there are specific questions, consult the Bayley II Administration Manual and/or call the NIH CHIME Coordinator who has access to a Bayley resource phone number.

J. What To Do If A Child Does Very Poorly on the Bayley

Should a tester find that a child does very poorly on the Bayley and appears to have developmental problems, he or she should bring this to the attention of the Principal Investigator at his or her site. They can review the entire laboratory session along with other information and make a determination about the need for discussing possibilities for further developmental evaluation with the parent or communicate with the infant's primary medical doctor to handle the situation as needed. The CHIME Coordinator or developmental assessment personnel should document that the child was referred to the study principal investigator. (The American Psychological Association practice guidelines suggest that if a child performs poorly on the Bayley Assessment, the child should undergo further testing. The CHIME Investigator should communicate this information to the infant's PMD.)

K. Bayley Materials

Bayley II kits have been purchased by all sites from The Psychological Corporation. The toys in the Bayley kit need to be washed thoroughly between each use, **whether or not children put them in their mouths.** The best routine for washing toys is to put them in soapy water, then rinse in clear water, then dip in a solution of 1 tsp. chlorine bleach mixed with 1 gallon water. Then they should be dried thoroughly with clean towels. Some Bayley materials cannot be soaked in water. These should be wiped with a bleach solution or other disinfectant. The book, stimulus booklet, and other cardboard materials need careful treatment and should **NOT** get wet! Some of them are not well coated and cannot stand much wetness. For these, be sure they are thoroughly wiped clean after each use.

While you are testing, be alert to what children are putting in their mouths. Try to retrieve the pegs and crayon before they go into children's mouths. Also be careful with the plastic bags used for peg sorting. The pencil in the kit, which should be sharpened for use in testing, also needs to be watched carefully.

L. Data transfer to DCAC

Upon completing the Bayley exam, Examiners must then fill out a **CHIME Bayley Transmittal Form** (K3). Write in the date the transmittal form was completed, who completed it, the infant's name, study id, the name of the Examiner (last name), which CHIME Medical Follow-up visit this was and evaluate the testing situation. Transcribe the infant's Date of Testing, Date of Birth, Chronological Age, Adjustment for Prematurity (Post-maturity) and Corrected Age from the Scoring Form onto the Transmittal form. Also include the infant's gestational age at birth in weeks and exam scores (both raw and index). When the transmittal form (K3) is completed, make a xerox copy for local use and mail the original form to DCAC with your weekly data packet:

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