Neonatal Follow-Up Program Handbook

Neonatal Follow-up Clinic
Women and Infants’ Hospital
134 Thurbers Avenue, Suite 215
Providence, Rhode Island

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Director

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January 1, 2015
# Handbook for Neonatal Follow-Up Program

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Neonatal Follow-up Clinic Handbook

Location: Family Assessment Center (handicap accessible)
134 Thurbers Avenue
Providence, RI 02905
Phone 401-453-7750

Hours: Tuesdays 9:00 - 4:30 pm
       Wednesdays 9:00 - 4:30 pm
       Thursday  9:00 - 4:30 pm

Criteria for Follow-up: Eligible infants:
Infants in the following categories are routinely scheduled: Premature infants weighing less than 1500 grams at birth or less than 34 weeks gestation, NICU infants of any birth weight with a variety of complications including IVH, BPD, asphyxia, meningitis, congenital malformations and infants discharged on cardiorespiratory monitors or oxygen. Infants may be referred for growth, neurologic, developmental or behavioral concerns. Visits may be scheduled from birth to adolescence- as indicated. Currently children from birth to 5 years of age are routinely longitudinally evaluated.

Staff: Follow-up Team

| Betty Vohr MD          | Clinic Director |
| Elisabeth McGowan      | Physician       |
| Lenore Keszler MD      | Physician       |
| Nico Vehse MD          | Pulmonologist   |
| Barbara Alksninis PNP  | Pediatric Nurse Practitioner |
| Megan Sheehan PNP      | Pediatric Nurse practitioner |
| Victoria Watson        | Psychologist    |
| Terri Leach            | Psychologist    |
| Dana Antonelli         | Senior Business Representative |
| Kat Kaplan             | Senior Business Representative |
| Andrea Halbrook        | Ambulatory Coordinator |
| Leslie McKinley        | Nutritionist    |
| Richard Tucker         | Data Analyst    |

Support Staff and Trainees

| Fellows: 1 fellow at each clinic | Position |
| Residents: Rotation              | Training |
| Undergraduates: 1                | Training |
| Medical student: 1               | Student  |
|                                 | Student  |
Purpose: The Follow-up Program has been providing supplemental care to infants who are cared for in the Special Care Nursery since 1974. The mission of the Follow-up Program is to provide a continuum of transition and follow-up care for graduates of the Neonatal Intensive Care Unit and to conduct prospective, longitudinal outcome studies including descriptive studies, intervention studies, clinical trials and multicenter clinical trials. Families receive comprehensive support, referrals, and feedback with recommendations.

The Follow-up clinic provides medical, behavioral and neurodevelopmental management for graduates of the NICU, maintains a database of outcomes, and is heavily committed to teaching fellows and residents. Referrals come from the NICU discharge planner, private practitioners, clinics, Early Intervention, VNA, and parents. Informed consent is obtained when indicated.

Assessments and Tests: Medical Management includes the following: Infants with medical problems such as apnea of prematurity, obstructive apnea, bronchopulmonary dysplasia, reflux and failure to thrive, are managed longitudinally until such time that the problem is resolved.

Service Components

Cardiorespiratory Monitors
1. Monitor alarms and clinical events are reviewed.
2. Physical and neurological examination completed.
3. Parents counseled on “normal events” which occur at home.
4. Medications and levels reviewed; tapered and discontinued as indicated.
5. Pulse oximetry done as needed; on oxygen, off oxygen, during a feed
6. Feeding observed
7. Repeat pneumogram ordered to assess ongoing events or alarms
8. Review 4-6 week memory monitor downloads

Bronchopulmonary dysplasia
1. Monitor pulmonary status and confounding conditions
2. History and physical
3. Monitor medications, taper as indicated
4. Monitor ventilation and oxygenation
5. Cardiorespiratory monitoring
6. Monitor growth velocity
7. Nutrition assessment- calculate intake of liquid, calories, protein, and calcium

Reflux
1. Review history of clinical reflux and alarms
2. Physical and neurological assessment
3. Review download if indicated
4. Order pneumogram with pH probe as necessary
5. Monitor growth velocity
7. Reflux management and precautions - medications, elevation of bed, small feeds, and thickened feeds

Failure to thrive
1. Nutrition consults with assessment of total caloric, protein, fat and carbohydrate intake
2. Assessment of growth velocity and weight/length ratio
4. Observe a feed

Neurosensory and developmental assessments are completed on high risk infants, results are provided to parents and recommendations made for appropriate support services within the community.
1. A complete assessment of neuromotor status is completed on each child at each visit along with an in depth developmental assessment and feedback is provided to families. A report of the visit is then forwarded to the pediatrician, Early Intervention and any other specialists the family wishes, and referrals are made to appropriate consultants (i.e. neurology, CP clinic, or orthopedics). Children are categorized neurologically as normal, suspect or abnormal and a specific diagnosis is made (i.e. spastic diplegia).

2. Age of assessment: Infants with special health care needs (such as oxygen, apnea monitor, feeding issues) are seen within 1 month of discharge and followed closely. Stable VLBW infants are seen at the corrected ages of 3 months, 7 months, 12 months, 24 months and a chronological age of 30-36 months and 5 years.

The Follow-Up Clinic provides assessments for premature babies and other children referred for developmental delays and learning difficulties. We complete evaluations in the following areas:

- Cognitive
- Language - Receptive and Expressive
- Motor – Fine and Gross
- Behavior – Internalizing and Externalizing
- Adaptive Behavior
- Executive Functioning
- Memory
- Achievement
- Phonological Processing

Screening or diagnostic tests

**Birth to 11 months**
Ireton Child Development Inventory: First 18 Months

**12, 24 & 30 months**
Bayley Scales of Infant Development, 3rd Edition (BSID-III)
- Cognitive Composite
- Language Composite
  - Expressive Communication
  - Receptive Communication
- Motor Composite
  - Fine Motor
  - Gross Motor

Autism Screen (ADOS)
- Response to Name
- Response to Joint Attention

Pervasive Developmental Disorder Screening Test (Stage II) [24 months]

Child Behavior Checklist (CBCL) [24 months +]
Internalizing Behaviors
- Emotionally Reactive
• Anxious/Depressed
• Somatic Complaints
•Withdrawn

Externalizing Behaviors
• Attention Problems
• Aggressive Behavior

3-5 years
Wechsler Preschool and Primary Scale of Intelligence-Third Edition (WPPSI-IV)
• Verbal Comprehension Index
• Visual Spatial Index
• Fluid Reasoning Index [age 5 only]
• Working Memory Index
• Processing Speed Index [age 5 only]
• Full Scale IQ

5 years
Beery-Buktenica Developmental Test of Visual-Motor Integration-Sixth Edition (VMI)
• Visual-Motor Integration Score

Movement Assessment Battery for Children (ABC)-2nd Edition
• Manual Dexterity
• Aiming and Catching
• Balance

Conners' Parent Rating Scale-Revised (CPRS-R)
• Oppositional Scale
• Cognitive Problems/Inattention Scale
• Hyperactivity Scale
• Conners' ADHD Index Scale

Child Behavior Checklist (CBCL)

Brief Rating Inventory of Executive Function – Preschool Version
<table>
<thead>
<tr>
<th>Tests</th>
<th>Age</th>
<th>Age</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bayley Scales of Infant Development, 3rd Edition (BSID-III)</td>
<td>12, 24, 30</td>
<td>NA</td>
</tr>
<tr>
<td>Wechsler Preschool and Primary Scale of Intelligence-4th Edition</td>
<td>5-6 y 11m</td>
<td>&gt; 7 y</td>
</tr>
<tr>
<td>(WPPSI-IV) [Ages 2y 6m to 7y 7m]</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Wechsler Intelligence Scale for Children-4th Edition (WISC-IV)</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>(Ages 6y+)</td>
<td>X</td>
<td>X</td>
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<tr>
<td>Wechsler Abbreviated Scale of Intelligence (WASI)</td>
<td>X</td>
<td>X</td>
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<tr>
<td>Beery Test of Vision Motor Integration (VMI)</td>
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<td>X</td>
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<tr>
<td>CRS-R (Conners’ Parent Rating Scale – Revised)</td>
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<td>X</td>
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<tr>
<td>Child Behavior Checklist CBCL</td>
<td>X</td>
<td>X</td>
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<tr>
<td>Vineland</td>
<td>X</td>
<td>X</td>
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<td>Behavior Rating Inventory of Executive Function (BRIEF)</td>
<td>X</td>
<td>X</td>
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<td>Kindergarten Readiness Test (KRT)</td>
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<td>X</td>
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<td>Wide Range Achievement Test-4th Edition (WRAT-IV)</td>
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<td>X</td>
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<td>Children’s Depression Inventory (CDI)</td>
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<td>X</td>
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<tr>
<td>Developmental Neuropsychological Assessment (NEPSY)</td>
<td>X</td>
<td>X</td>
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<td>[Ages 5-12]</td>
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The Premature Infant - Definitions

Low birth weight (LBW) - birth weight is less than 2500 g

Very low birth weight (VLBW) - birth weight is less than 1500 g.

Extremely low birth weight (ELBW) - birth weight is less than 1000 g

Early Preterm - < 32 weeks

Moderate Preterm - 32-33 weeks

Late Preterm – 34-37 weeks

Term infant - any neonate whose birth occurs at 38 to 42 weeks.

Micro premie - any neonate whose birth weight is less than 750 g.

Premature - any neonate whose birth occurs at 37 weeks or less.

Gestational Age - The number of completed weeks that have elapsed between the first day of the last menstrual period and the day of delivery.

Chronological Age - The age of the infant based on the number of weeks or months since the date of delivery.

Corrected Age - The age of the infant calculated from the expected date of delivery. It may also be calculated by subtracting the number of weeks of prematurity from the chronological age. For example, an infant born 6 months ago with a gestational age of 28 weeks (3 months premature) has a chronologic age of 6 months and a corrected age of 3 months.

Small for gestation – weight <10th % for gestation

Appropriate for gestation – weight ≥10th% for gestation

Threshold of viability - 22-23 weeks gestation
Premie Care the First Year; Management Issues

With the advent of the surfactant era and increasingly sophisticated ventilation strategies, very low birth weight (VLBW) infants <1500 grams are surviving in increasing numbers. In addition, newly developed managed health care guidelines are resulting in early discharge recommendations. VLBW infants, previously discharged near term age (40±2 weeks), are now commonly discharged at 35 to 36 weeks of age, and sometimes as early as 32 weeks of age. Therefore, the primary care physician seeing pediatric patients is now caring for more VLBW survivors with complex medical problems and initiating care at an earlier, more vulnerable age.

Providing a smooth transition from Neonatal Intensive Care Unit (NICU) care to home care requires a detailed transfer of information to both the family, the primary physician (the medical home) and involved subspecialists. A copy of the NICU discharge summary is made available at the time of discharge and should include the following: 1) Newborn problem list, 2) Medications and doses, 3) Nutritional recommendations and a copy of the hospital growth chart, 4) Home monitor, oxygen, G-Tube/J-Tube, requirements, 5) Primary Care appointment within 1-2 weeks of discharge, 6) Appointments with consultants/specialty services, and 7) Support services needed: i.e. Home Care, Visiting Nurse, Early Intervention.

Having this basic information along with a copy of the hospitalization summary will permit the primary physician to continue the coordination of the infants’ and family’s care. Five areas to be covered are: 1. growth and nutrition, 2. Bronchopulmonary Dysplasia (BPD), 3. Apnea monitoring, G-tubes, Reflux, 4. Immunizations, 5. Neurologic and developmental status.

Growth in Follow-Up Clinic

An understanding of a premature infant’s well being and growth pattern requires an awareness of the infant’s gestation and growth status at birth, i.e. Appropriate for Gestation (AGA) and Small for Gestational Age (SGA) < 10th % for age and gender, chronologic age, and corrected age. The definitions of these terms are on page 5. For infants discharged prior to term, an intrauterine growth curve is needed to plot growth changes, whereas after 40 weeks a standard growth curve can be utilized. The Centers for Disease Control and Prevention (CDC) recommends the WHO growth standards to monitor growth for infants and children 0 to 2 years of age and the CDC growth charts for children 2 years and older in the U.S. It is recommended that “corrected age” be used when plotting growth parameters for VLBW infants from birth to 2 years 6 months of age.

ELBW survivors have an elevated risk of growth failure. The majority of very low birth weight (VLBW; ≤1500g) infants become growth restricted with parameters below the 10th percentile by 36 weeks postconceptional age, and many remain small into childhood and adolescence. Hack et al reported, however, that VLBW infants have numerous sporadic episodes of accelerated growth velocity during the first year. Acceleration should occur between 4 and 12 months with growth parameters approaching the 25th to 50th percentile. Micropremies, infants born at 23 to 26 weeks gestation, often have a more delayed growth pattern. Head growth for both AGA and SGA infants achieves catch-up before weight and length, and is not unusual for the head circumference to be at the 50th to 90th percentile with weight and length still at the 3rd to 25th percentile. This is related to earlier accelerated brain growth velocity in the stable healthy infants with appropriate nutritional intake. Fontanel size is large during this phase. A continually increasing fontanel or a tense or pulsating fontanel suggests the development of late onset hydrocephalus, requiring further evaluation.
SGA infants with symmetric growth restriction, that is weight, length, and head circumference <10th percentile has a lowered potential for “catch up” growth. It is important to plot growth parameters at regular intervals to identify infants falling off their growth curve, or accelerating at an abnormal rate. A more precise way of tracking changes in growth velocity is to compare percentiles or z-scores of measurements over time. Percentile and z-score calculators are available at: www.PediTools.org.

References:

12. http://www.cdc.gov/growthcharts At this website links to both the WHO and CDC growth charts and the article MMR: Use of WHO and CDC Growth Charts for Children aged 0-59 months in the US are available.
Nutrition in Follow-Up Clinic

Often nutritional issues are not completely resolved at the time an infant leaves the Women & Infants Hospital NICU. A neonatal nutritionist from the NICU is available to make recommendations and provide nutritional assessments for providers and caregivers as requested. Criteria for referral to the nutritionist at Follow-Up Clinic include:

- Length-for-age (corrected or chronologic age, as appropriate) <2nd percentile for children from birth through 24 months of age on WHO growth standard.
- Height-for-age (corrected or chronologic age, as appropriate) <5th percentile for children >24 months of age on CDC growth curve.
- Weight-for-length <2nd percentiles or >98th percentile for children from birth through 24 months of age on WHO growth standard.
- BMI <5th percentile or ≥85th percentile for children older than 2 years.
- Weight-for-length or BMI have decreased or increased two or more major percentile rankings on the approved growth curve since the last visit.
- Diet and/or feeding patterns/practices appear inadequate or inappropriate.
- Questions arise concerning safe preparation, handling, and storage of infant/pediatric formula and foods.
- Family has inadequate access to food (food insecurity).
- Parents or caregiver(s) have nutrition-related questions or concerns.

Adapted from CDC Growth Curves References1,2,3

<table>
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<tr>
<th>Anthropometric Index</th>
<th>Percentile Cut-off Value</th>
<th>Nutritional Status Indicator</th>
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<tr>
<td>Lt-for-age (0-24 m)</td>
<td>&lt; 2nd</td>
<td>Short Stature</td>
</tr>
<tr>
<td>Ht-for-age (&gt;24 m)</td>
<td>&lt;5th</td>
<td>Short Stature</td>
</tr>
<tr>
<td>Weight-for-Length (0-24 m)</td>
<td>&lt; 2nd</td>
<td>Underweight</td>
</tr>
<tr>
<td>BMI-for-Age (&gt; 24 m)</td>
<td>&lt; 5th</td>
<td>Underweight</td>
</tr>
<tr>
<td>Weight-for-Length (0-24 m)</td>
<td>≥ 98th</td>
<td>Overweight</td>
</tr>
<tr>
<td>BMI-for-Age (&gt; 24 m)</td>
<td>≥ 85th and &lt; 95th</td>
<td>At Risk of Overweight</td>
</tr>
<tr>
<td>BMI-for-Age (&gt; 24 m)</td>
<td>≥ 95th</td>
<td>Overweight</td>
</tr>
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</table>

In 2014, guidelines were published to provide clinicians with evidence-based criteria to identify malnutrition in the pediatric population.4 All premature infants are at nutritional risk during neonatal hospitalization. For some, malnutrition may develop. The more complicated the neonatal medical course is for a premature infant, the more likely that malnutrition will become a diagnosis. Former premature infants may remain at increased risk for a period of time after neonatal
hospitalization while their bodies work to increase and replenish nutrient stores. For these reasons, when more intensive nutrition management is required, the Follow-Up Clinic nutritionist may recommend a referral to an Early Intervention nutritionist, WIC Program nutritionist, or the Feeding Team nutritionist at Hasbro/RIH. For mothers who breast feed their former premature infants, the Women & Infants Hospital lactation consultants are another source of support.

References:

By the week of discharge from the NICU, most premature infants are consuming 11 to 13 ounces per day of breast milk or formula ad libitum (i.e., approximately 165 to 200 ml/kg/d). These per kg volumes are excellent but will not provide adequate protein and nutrient intakes if premature infants are taking full-term infant formulas. At these intakes on full-term infant formulas, preterm infants would receive only 42 to 50 percent of the dietary intake recommended for term infants. Full-term infants require approximately 26 oz/d of 20 kcal/oz full-term formula to meet their nutritional needs.

Preterm infants may have even greater nutrient needs than full-term infants and will not consume 26 oz/d (even at an intake of 200 ml/kg/d) until they reach a weight of 4 kg (8 lb 13 oz). For that reason, just before discharge from the NICU, formula-fed infants move from premature infant formula to transitional infant formula. Transitional formula has a nutrient density that is between that of premature formulas and full term formulas. One nutrient, iron, is the exception to this rule. Iron content is 1.8 mg per 100 kcal of formula, the same as in most iron-fortified infant formulas. Transitional formula is also used as a supplement for former premature infants who are breast fed.

We recommend that premature infants receive breast milk or infant formula exclusively until 4 to 6 months corrected age. We discourage the introduction of solids before this time because developmental readiness for solid foods may appear later for premature infants than term infants. Signs of readiness include an infant's ability to: control his head and neck, sit up with support, show interest in food when hungry, and indicate when satisfied by turning the head away or refusing to open the mouth. Feeding guidelines for former premature infants are the same as for full-term infants with one exception. Corrected age, rather than chronologic age, should be used as a guide for when to start solids. Feeding liquids and solids at the appropriate developmental stage (and by developmentally appropriate means) is as important for the premature infant as it is for the full-term infant.

Because most caregivers of former premature infants see their infants in terms of chronological age rather than corrected age, they may need gentle reminders not to start solids too soon. Caregivers should be encouraged to use an infant's corrected age and follow the American Academy of Pediatrics guidelines for introducing solids during the first year. From 4 to 6 months corrected age, it may also be helpful to encourage that infants receive breast milk or infant formula
first at meal-time and solids second, to assure adequate breast milk or formula intake. Breast milk or infant formula should continue until 12 months corrected age. Mothers should be encouraged to breastfeed their child beyond the first year of life if desired.

The early introduction of solids may compromise nutritional intake. Solid foods are generally less nutrient dense than breast milk or infant formula. Compromised nutrition may also occur if caregivers start cow's milk or fruit juices too soon. We recommend that fruit juice begin between 6 to 8 months corrected age and that whole cow's milk be started at 1 year corrected age. The early use of these may decrease formula intake and so cause an imbalance in nutrient intake. Forced feeding may occur if families mix solids with formula in the bottle or other bottle-like feeder.

With an appropriate nutritional intake at home, the premature infant will likely thrive. At Follow-Up Clinic visits, we have seen improved growth in infants who consume a transitional formula. Before transitional formulas were available, catch-up growth was often poorest for infants' length. With transitional formulas we see greater improvement in length measurements and a better balance of nutrient intake for infants born at less than 37 weeks gestation and weighing less than 2 kg (4 lb 6 oz).

The question of how long an infant should remain on a transitional formula remains unclear due to limited research. Taking parental stature into account, length, weight, and head circumference measurements should show evidence of catch-up by three months corrected age and gradually reach at least the 25th to the 50th percentile at a child's own rate. When an infant reaches and maintains these percentiles and is able to consume approximately 26 oz/d of formula, it may be appropriate to change to a term formula. If the infant does not maintain growth progress on the term formula, return to the transitional formula and, as appropriate, request a nutrition assessment. A more general guideline is:

<table>
<thead>
<tr>
<th>Birthweight:</th>
<th>Use enriched feedings until:</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; 1000 g</td>
<td>9 to 12 months</td>
</tr>
<tr>
<td>1000 to 1499 g</td>
<td>6 to 9 months</td>
</tr>
<tr>
<td>1500 to 2000 g</td>
<td>3 to 6 months</td>
</tr>
<tr>
<td>&gt; 2000 g</td>
<td>1 to 3 months</td>
</tr>
</tbody>
</table>

The impact of the transitional formula on growth may lessen as infants mature and consume more and more of their diets as solids.

In general, we assume that larger, healthier premature infants may require less time on transitional formula than smaller, sicker premature infants. Growth progress is monitored using the WHO and CDC growth curves as previously discussed. Measurements are plotted using corrected age. We recommend that pediatricians plot measurement at the corrected age until a child is 2 ½ years old and use a length board to measure recumbent length. It is expected that catch-up growth will be more difficult for small-for-gestational age infants than for appropriate-for-gestational age infants.
Approximate growth rates for girls and boys at the 50th percentile of the WHO growth standards are:

<table>
<thead>
<tr>
<th>Age Group</th>
<th>Weight</th>
<th>Length</th>
</tr>
</thead>
<tbody>
<tr>
<td>Birth to 3 months</td>
<td>31 g/d</td>
<td>0.85 cm/wk</td>
</tr>
<tr>
<td>3 to 6 months</td>
<td>17 g/d</td>
<td>0.47 cm/wk</td>
</tr>
<tr>
<td>6 to 9 months</td>
<td>11 g/d</td>
<td>0.34 cm/wk</td>
</tr>
<tr>
<td>9 to 12 months</td>
<td>8 g/d</td>
<td>0.29 cm/wk</td>
</tr>
</tbody>
</table>

During the catch-up phase, premature infants may gain at significantly greater rates than those above. High nutritional intakes will accompany rapid growth. Ideally, the percentile ranking for weight-for-age and the one for length-for-age should be less than two percentile rankings apart when compared on growth curves. Body weight and length are in proportion when the age-independent measure of weight-for-length that falls between the 25th and the 75th percentile.

Strategies to prevent overweight and obesity in full-term infants such as delaying the introduction of solids until 4 to 6 months of age and avoiding putting infants to bed with bottles of formula may also be effective with former premature infants who show signs of rapid weight gain.

Feeding premature infants and children can challenge both the Follow-Up Clinic staff and the family. Meeting the special nutritional needs of these infants and children will promote recovery, enable catch-up growth, and optimize development. The following tables summarize basic information about breast milk, standard infant formulas, recipes/mixing instructions and management of a gastrostomy tube that may be useful as quick references when seeing patients in Follow-Up Clinic.

Most full-term infant formulas are available in three forms: ready-to-use, concentrate, and powder. When prepared according to the directions on the label, the three forms of a brand are equivalent nutritionally even if the appearance varies. The concentrate and powder forms of a brand are usually more economical to use than the ready-to-feed version.

Powdered infant formula is the main form of infant formula sold in the US. Over 80% of our formula dollars are spent on powdered formula. While formula powder is not sterile, it is safe when prepared and stored properly. In fact, powdered formula offers a food safety advantage when people are traveling or out for the day because formula from powder can be mixed fresh for each feeding. Recipes for mixing infant formulas are available on the Women & Infants Hospital NICU sharepoint and in formula company literature located in Follow-Up Clinic. It is important to measure formula powder carefully. For recipes that use scoops to measure the powdered formula, use only the scoop that came in the can of powdered formula.

The transitional formulas (NeoSure and EnfaCare) are available in ready-to-use and in powdered form. The standard dilution is 22 kcal/oz of formula, but it can also be mixed to other concentrations. We often recommend that transitional formula be concentrated to 24 kcal/oz for infants with poor growth. Occasionally we recommend concentrating further to 27 kcal/oz. Caregivers using 27 kcal/oz formula must be cautioned to use it as directed. Fed alone, formulas concentrated to 27 kcal/oz have high renal solute loads and should not be used without close medical supervision, especially in hot weather or when total fluids are restricted to <120 ml/kg/d.

Occasionally a full-term infant will require a calorie-enhanced formula (i.e., one that contains more than 20 calories per fluid ounce when ready-to-use). Since this type of formula is not sold in the stores, it is necessary to prepare it at home from concentrate or powder. Calories may be
increased from 20 to a maximum of 30 calories per fluid ounce. Increases should be made slowly - first by concentrating the formula to 22, 24, and then 27 calories per ounce and later with additional calories from corn oil (a fat).

It is not uncommon for caregivers to misunderstand and/or lose formula recipe instructions that they received when their infant was discharged from the NICU. This can happen to caregivers of all income and education levels. When it does happen, caregivers may unintentionally over or under dilute formula, providing too many or too few calories/oz to their infant which. This may result in over or undernutrition and growth that is too rapid or too slow.

Caregivers may also unintentionally use unsafe procedures when preparing formula. Some common examples of unsafe formula preparation include the caregiver not washing hands and/or the mixing area before preparing formula, not cleaning bottles and nipples properly, measuring ingredients improperly, using warm water from the tap to mix formula, and letting prepared formula sit out for too long before refrigeration. When formula is prepared using unsafe procedures, an infant is at high risk for food-borne illness. Because formula mixing errors can happen easily, caregivers should be asked at each clinic visit to state the name of the formula their infant is on, the calories/oz, the recipe they are using, and how they are preparing the formula. Checklists for preparing infant formula safely are available at this link: http://www.dhhs.nh.gov/dphs/nhp/wic/documents/formula.pdf.

The Special Supplemental Food Program for Women, Infants, and Children (WIC) most often provides families with powdered infant formula. In both Rhode Island and Massachusetts, the WIC Program currently has contracts to provide families with Enfamil Premium infant formula and Prosobee (soy) infant formula. Other formulas, including NeoSure or EnfaCare, are readily available through the WIC Program but will require that the physician or nurse practitioner complete a prescription formula form stating the name of the formula and the reason for its use.

The WIC Program is a supplemental food and nutrition education program to assure adequate access to food for families and to link them with health care providers. Women as well as infants and children less than 5 years old who have an income below 185% of the poverty level and are at nutritional risk are eligible for WIC. Information about the WIC Program and SNAP (formerly the Food Stamp Program) and other federally funded programs may be found at www.fns.usda.gov or at state websites for these programs.

Children over one year of age who are failure-to-thrive may need a supplemental pediatric formula such as PediaSure or Kindercal (30 kcal/oz ready-to-feed). Both are available through the WIC Program. A less expensive alternative is Carnation Instant Breakfast mixed with whole milk, providing 30 kcal/oz. Adding corn oil to these products to increase calories even further is generally not recommended. Children receiving these products may need to be followed closely by their pediatricians. A nutritionist can help families use these products in a way that incorporates them into age-appropriate and developmentally-appropriate feeding patterns while medical issues resolve.

Two components of children’s diets that may not be readily apparent during a visit to the pediatrician are caffeine and natural health products. Beverages provide the largest amounts of caffeine in children’s diet. Natural health products are a part of complementary and alternative medicines and include herbs and vitamins supplements. To understand when caffeine and natural health products are used with children and how much is used is important for the clinician to know. Both carry risks, and benefits are often not evidence based.
Using data from the 1999 to 2010 National Health and Nutrition Examination Survey (NHANES), researchers found that 63% of 2 to 5 year olds and about 75% of 6 to 18 year olds consumed caffeine on any given day. Mean caffeine intake increased with age among those who consumed caffeine from $15.9 \pm 1.2$ mg/d for 2 to 5 year olds and $31.8 \pm 1.6$ mg/d for 6 to 11 year olds to $109.9 \pm 7.1$ mg/d for 16 to 18 year olds. The items contributing the most caffeine were soda and tea for 2 to 11 year olds and soda, tea, and coffee for the 16 to 18 year olds. The prevalence of caffeine use and the mean caffeine intake varied by year but did not appear to increase over time. These data may help clinicians as they guide families regarding wise beverage choices for children and consider interactions between caffeine and medications (Branum AM, LM Rossen, and KC Schoendorf. Trends in caffeine intake among US children and adolescents. *Pediatrics*. 2014;133:386-393).

Natural health products include: vitamins, minerals, herbal remedies, folk remedies, homeopathic medicines, traditional Chinese medicines, probiotics, amino acids, and fish oils. To determine the prevalence of natural health products, researchers in Canada surveyed the parents of 333 children (5.1 $\pm$ 3.3 years old). Almost half (45.5%) of parents stated that their children used one or more natural health product: for example, vitamins, chamomile tea, green tea, Echinacea, fish or omega 3 oils, and other substances. Parents reported using these products to improve health and immunity and to prevent colds and infections. More than half (51.7%) reported that their children benefited from these products, while 4.4% reported adverse side effects. Less than half (45%) told physicians about using natural health products. (Godwin M, J Crellin, M Mathews, NL Chowdhury, LA Newhook, A Pike, F McCrate, and R Law. Use of natural health products in children: Survey of parents in waiting rooms. *Canadian Family Physician*. 2013;59:364-371).

Data from the Infant Feeding Practices Study II revealed that between 2005-2007, 9% of US infants received botanical teas or supplements during the first year of life. Dietary botanical supplements were most often given for reduce fussiness, aid digestion, decrease colic, and promote relaxation. Many products were marketed for infants and were only used for a short time. (Zhang Y, EB Fein, and SB Fein. Feeding of dietary botanical supplements and teas to infants in the United States. *Pediatrics*. 2011;127:1060-1066.) In a review of 15 randomized clinical trials with 944 infants, researchers indicated that fennel extract, mixed herbal tea, and sugar solutions may benefit colicy infants. However, the studies had major limitations, and results need to be replicated. (Perry R, K Hunt, and E Ernst. Nutritional supplements and other complementary medicines for infantile colic: A systematic review. *Pediatrics*. 2011;127:720-733).

While little research exists about the benefits and risks of specific natural health products for infants, cautions exist. These products may have significant side effects and drug interactions. One source of reliable, evidence-based information about natural health products is the National Center for Complementary and Integrative Health (NCCIH), an agency within the National Institutes of Health. The web address is: [https://nccih.nih.gov/](https://nccih.nih.gov/). The site contains sections on herbs, clinical practice guidelines, and literature reviews as well as other information.

Health care providers are an important resource to reduce hunger and improve nutrition for families with inadequate access to food (*Preventive Medicine* 2012;55(3):219-222). Recently, a 2-item screening tool was developed to identify families of young children at risk for food insecurity (*Pediatrics* 2010;126:e26-e32). The screening tool was derived from the US Department of Agriculture 18-item Household Food Security Survey. A response of “True” or “Mostly True” to these questions: “Within the past 12 months we worried whether our food would run out before we...
got money to buy more.” And “Within the past 12 months the food we bought just didn’t last and we didn’t have money to get more.” provided a good indication of food insecurity in households with young children. With this knowledge, health care providers can refer families to community resources to improve access to food.

For nutritional problems that require on-going support, infants and children may need to be referred to nutritionists in the community who are able to follow the patient more closely than is possible for the nutritionist in the Follow-Up Clinic. Nutritionists are available through outpatient pediatric clinics at Hasbro Children’s Hospital/Rhode Island Hospital and through the Early Intervention programs in the Department of Public Health. Occupational therapists participate in each of these programs.
Breast Milk, Formulas & Feeding Additives Used in W&I Follow-Up Clinic

<table>
<thead>
<tr>
<th>Human Milk</th>
<th>The gold standard &amp; the BEST substrate for all infants – premature and full term</th>
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| Transitional infant formula | **For premature infants to go home on** (NeoSure / EnfaCare)  
- Available as 22 kcal/oz ready-to-use in-house or as powder & ready-to-use outside the hospital  
- Provides 1.5-2 times the nutrients in plain Human Milk or full-term infant formula  
- Ideally, will continue on transitional infant formula after discharge until growth is caught up |
| Standard full-term infant formula | **For full-term infants**: nutrient composition is based on Human milk (Enfamil / Good Start / Similac / store brand)  
- 26 oz/day of 20 kcal/oz formula will meet the nutritional needs of healthy, full-term infants |
| Soy full-term infant formula | **For full-term infants**: nutrient composition is based on Human milk (Prosobee / Good Start Soy / Isomil / store brand)  
- Contains soy protein in place of cow’s milk protein; lactose free  
- Available as 20 kcal/oz ready-to-use and as formula powder  
- **AAP recommends for**: 1. Galactosemia or hereditary lactase deficiency, 2. documented lactose intolerance, 3. vegetarian-based diet desired by parents  
- **AAP does not recommend for**: 1. premature infants who weight <1800 g, 2. atopic disease prevention, 3. documented cow’s milk protein-induced enteropathy |
| Elemental and semi-elemental full-term infant formula | **For full-term infants with fat malabsorption or who may be sensitive to intact proteins** (Pregestimil / Alimentum / Nutramagen – for both problems)  
- For both problems)  
- **AAP recommends for**: 1. milk or soy protein allergies or intolerance and 2. fat malabsorption |
| Pediatric formulas | **For children over 1 year of age**: (e.g., Pediasure, Boost Kid Essentials, Nutren Jr, Peptamen Jr, Neocate One+, Carnation Instant Breakfast)  
- Nutrient and calorie dense for children who are unable to take sufficient nutrition through a traditional diet.  
- Full-strength may provide 1, 1.5, or 2 kcal/mil. |
| Vitamin–mineral supplements | **Poly-vi-sol with Fe**: 1 mL/d contains: 10 mg iron, 400 IU vit D, 1500 IU vit A, 5 IU vit E, 35 mg vit C, 0.5 mg thiamine, 0.6 mg riboflavin, 8 mg niacin, and 0.4 mg vit B12  
- **ADEK with zinc**: contains fat-soluble vitamins in water-soluble form; contains no iron  
- **Fer-in-sol**: 0.4 mL/d (10 mg elemental iron); contains iron only |

Additives that may be used at home:

| Formula powder | Added to increase calories and nutrients.  
- Keeps nutrients in balance.  
- Powder may be used as a breast milk additive for preemies just prior to discharge and at home |
| Corn Oil | A long chain fat added to increase calories (usually when nutrients already adequate) — Readily available  
- Contains essential fatty acids and fat soluble vitamins  
- Absorption requires bile salts; transported via lymph system. Prememies may not absorb well.  
- Mixes poorly in Human Milk and formula; separates and adheres to feeding apparatus  
- 0.45 mL per 1 ounce of Human Milk or infant formula adds 3 calories (1 mL = 8.3 kcal) |
| MCT (Medium Chain Triglyceride) Oil | A medium chain fat added to increase calories when absorption is impaired — Costly to purchase  
- Contains no essential fatty acids  
- Absorption does not require bile salts; transported via the portal vein  
- Mixes poorly in HM and formula; separates and adheres to feeding apparatus  
- 0.45 mL per 1 ounce of Human Milk or infant formula adds 3 calories (1 mL = 7.6 kcal) |
| Microlipids | A long chain fat used for larger preemies & term babies to increase calories — Costly to purchase  
- Contains essential fatty acids and fat soluble vitamins  
- Absorption requires bile salts; transported via lymph system. Prememies may not absorb well.  
- An emulsified, long chain fat that stays in solution  
- 0.65 mL per 1 ounce of Human Milk or infant formula adds 3 calories (1 mL = 4.5 kcal) |
BREASTFEEDING WHILE USING DRUGS GUIDELINE

PURPOSE: To provide evidence-based guidelines for the evaluation and management of breastfeeding for women who are taking prescribed, over-the-counter and/or illicit medications

GUIDELINE:

1. Most prescribed and over-the-counter medications are safe for the breast feeding infant. Some medications may make it necessary to interrupt breastfeeding (examples: radioactive isotopes, antimetabolites, cancer chemotherapy, some psychotropic medications, and a small number of other medications).

2. Substance exposed newborn (SEN): In situations where the mother is maintained on opioid replacement therapy (methadone or buprenorphine), if there are no contraindications, breast feeding is encouraged. Breast feeding in these substance-exposed newborns (SEN) can improve mother-infant bonding, reinforce maternal abstinence from illicit drugs, and delay the onset of, and reduce the need for pharmacotherapy for neonatal abstinence.
   a. As with all breast-feeding dyads, the mother should be encouraged to nurse in the delivery room within one hour of birth
   b. Communication between obstetrics and pediatrics with regard to intention to breast feed will allow for consistency of care
   c. All other aspects of care for the SEN (toxicology screening, social services consult etc) will be provided per protocol. (Refer to NAS guideline)

3. The transfer of methadone to human milk is minimal. Buprenorphine has poor bioavailability, is unlikely to have a negative effect on the infant, and as such is compatible with nursing. Both medications are considered 1.2 and nursing is encouraged regardless of medication dose. The following considerations may assist the provider in counseling the mother to breast feed while on opioid replacement therapy:
   a. Stable methadone or buprenorphine maintained mother

   And

   b. Negative maternal urine toxicology testing for the last 12 weeks before birth and at delivery except for above prescribed medications

   And

   c. Received consistent prenatal care

   And

   d. Compliant in treatment for a minimum of 12 weeks

   And

   e. There are no other illicit medications used or prescribed medications (eg: psychotropics) that would preclude breast feeding.

   And

   f. There are no medical contraindications to nursing (eg: HIV)
Not all of this information may be available at the time of birth. If there are no known contraindications, it is reasonable to encourage breastfeeding and explain to the mother that confirmation of treatment compliance will be pursued. If concerns are identified, this may impact continued breastfeeding.

4. Mothers currently using illicit drugs (e.g. cocaine, heroin) should not be encouraged to breastfeed.

5. Although evidence is less clear, mothers currently using marijuana should not breastfeed regardless of whether they have a prescription for its use.
   a. Marijuana remains an illicit substance with associated legal risk.
   b. THC has a long half life (67 days) and can be detected in a urine toxic screen for up to one month in adults
   c. THC is fat soluble and accumulates in the breast milk of the heavy user
   d. The AAP, ABM and Hale’s Medications in Mother’s Milk all consider marijuana use to be contraindicated for lactation
   e. Short-term effects may include infant sedation, poor suck and feeding patterns decreased tone, and sleep disturbances
   f. Exposure in the first month post partum may be associated with decreased motor development at one year and aggression and attention problems in toddlers

6. Other circumstances where breastfeeding should be discouraged include:
   a. Women who relapsed to illicit drug use or drug misuse during the 30-days prior to the delivery period
   b. Women who are not in a treatment program or who are not willing to provide consent for contact with treatment providers

7. Women under the following circumstances should be evaluated individually and a breastfeeding recommendation for suitability or lack thereof be determined by coordinated care plans with the parents, medical team and substance abuse treatment providers. There are currently no evidence based recommendations for patients that fall into these categories. If breastfeeding is considered, potential options may include pumping and discarding milk until toxic screens are negative, or pumping and discarding milk at the peak level of a prescribed drug.
   a. Women who did not receive prenatal care
   b. Women who relapsed between 1-3 months prior to delivery, but who have maintained sobriety within 1 month of delivery
   c. Women prescribed multiple psychotropic medications
   d. Women chronically taking prescribed licit opioid medication (not replacement therapy such as buprenorphine or methadone)
   e. Women who engaged in prenatal care and/or substance abuse treatment during or after the 2nd trimester
   f. Women who demonstrate behavioral qualities or other indicators of active drug use. These situations should be addressed in a timely fashion. (Refer to NAS guideline).

8. When it is has been determined by the infant’s healthcare provider that breastfeeding is contraindicated, the following will NOT occur:
   a. Provision of lactation service (unless guidance is needed to effect the cessation of lactation)
   b. Provision of breast pump
9. If the mother insists on breast feeding despite a recommendation that this not occur, the mother will be informed by the health care provider that this is against medical advice. This information will be documented in the medical record. A social services referral may be made and if appropriate, community social services agency notified.

10. The following are accepted references to evaluate whether certain medications are safe during breast feeding. Many of these resources are available on the computer desktop:
   a. Drug and lactation database of the US National Library of Medicine, TOXNET: Toxicology Data Network (LactMed) (free app available)
   b. Medications and Mothers’ Milk by Thomas Hale
   d. Drugs in Pregnancy and Lactation by G.G. Briggs, R.K. Freeman and S.J. Yaffe (free app available for I phone)
   f. The Academy of Breast Feeding Medicine (ABM) (statement, 2009)

References:
ACOG Committee Opinion: Opioid Abuse, Dependence, and Addiction in Pregnancy, 2012, Number 524.
Breast Milk and Infant Formula Recipes Commonly Used in W&I Follow-Up Clinic

### FOR FORMER PREMATURE INFANTS
- **Human Milk**
  - 20 kcal/oz = Human Milk, plain
  - 22 kcal/oz = ½ tsp Transitional formula powder + 3 oz (90 mL) Human Milk
  - 24 kcal/oz = ⅛ tsp Transitional formula powder + 1.5 oz (45 mL) Human Milk
  - 27 kcal/oz = 1 tsp Transitional formula powder + 2 oz (60 mL) Human Milk
  - 30 kcal/oz = 1½ tsp Transitional formula powder + 2 oz (60 mL) Human Milk

- **Transitional Infant Formula (EnfaCare and NeoSure)**
  - 20 kcal/oz = 2 scoops Transitional formula powder + 4.5 oz water ➔ 5 fluid ounces
  - 22 kcal/oz = 2 scoops Transitional formula powder + 4 oz water ➔ 4 fluid ounces
  - 24 kcal/oz = 3 scoops Transitional formula powder + 5.5 oz water ➔ 6.5 fluid ounces
  - 27 kcal/oz = 5 scoops Transitional formula powder + 8 oz water ➔ 9 fluid ounces
  - 30 kcal/oz = 3 scoops Transitional formula powder + 4 oz water ➔ 4.5 ounces

### FOR FULL-TERM INFANTS
- **Human Milk**
  - 20 kcal/oz = Human Milk, plain
  - 22 kcal/oz = ½ tsp Transitional formula powder + 3 oz (90 mL) Human Milk
  - 24 kcal/oz = ⅛ tsp Transitional formula powder + 1.5 oz (45 mL) Human Milk
  - 27 kcal/oz = 1 tsp Transitional formula powder + 2 oz (60 mL) Human Milk
  - 30 kcal/oz = 1½ tsp Transitional formula powder + 2 oz (60 mL) Human Milk

- **Full-Term Infant Formula (Enfamil, Good Start, Similac; Good Start Soy, Isomil, Prosobee; Alimentum, Nutramagen, and Pregestimil; Similac PM 60/40)**
  - 20 kcal/oz = 2 scoops Full-Term formula powder + 4 oz water ➔ 4 fluid ounces
  - 22 kcal/oz = 2 scoops Full-Term formula powder + 3.5 oz water ➔ 4 fluid ounces
  - 24 kcal/oz = 3 scoops Full-Term formula powder + 5 oz water ➔ 6 fluid ounces
  - 27 kcal/oz = 3 scoops Full-Term formula powder + 4.25 oz water ➔ 5 fluid ounces

### NOTES
1. At each visit to the Follow-Up Clinic, ask the caregiver to state the formula recipe that she/he is using and the steps followed to prepare the feedings. If you have questions, please speak with the nutritionist.
2. Mixing brands of infant formula is sometimes necessary. It is OK to mix brands of transitional formulas (Enfacare/Neoasure) OR brands of full-term cow’s milk-based formulas (Enfamil/Similac/Good Start/store brand) OR brands of full-term soy milk-based formulas (Prosobee/Isomil/Good Start Soy/store brand). In addition, we sometimes add transitional formula powder to different brands of full-term cow’s milk-based formula. This is also safe. Please reassure parents if they have questions. If you have questions, don’t hesitate to speak with the nutritionist.
3. The current WIC contract formulas are Enfamil and Prosobee. Most other infant formulas are available through the WIC Program with a physician’s prescription.

### ABBREVIATION
- **tsp** = measuring teaspoon (level, **not** rounded or heaping)

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June 2007
Figure 6a:
Preparation Checklist for Standard Ready-to-Feed Iron-Fortified Infant Formula (using glass or hard plastic bottles)

1. Wash your hands, arms, and under your nails, very well with soap and warm water. Rinse thoroughly. Clean and sanitize your workspace.

2. Wash bottles and nipples, using bottle and nipple brushes, and caps, rings, and preparation utensils in hot soapy water before using. Rinse thoroughly.

3. Squeeze clean water through nipple holes to be sure they are open.

4. Put the bottles, nipples, caps, and rings in a pot and cover with water. Put the pot over heat, bring to a boil, and boil for 5 minutes. Remove from heat, cool, and air dry.

5. Wash the top of the can with soap and water and rinse well to remove dirt. Wash the can opener with soap and hot water.

6. SHAKE CAN WELL and then open the can.

7. Pour the amount of ready-to-feed formula for one feeding into a clean bottle. Do not add water or any other liquid.

8. Attach nipple and cap and SHAKE WELL. Feed prepared formula immediately.

9. If more than one bottle is prepared, put a clean nipple right side up on each bottle and cover with a nipple cap. Label each bottle with the baby’s name and the date and time it was prepared.

10. Refrigerate until feeding time. Use within 48 hours. Do not leave formula at room temperature. To warm bottle, hold under running warm water. Do not microwave bottles. If formula is left in the can, cover and refrigerate open can until needed. Use within 48 hours.

11. Throw out unused formula left in bottle after feeding or which has been unrefrigerated for 1 hour or more. Store unopened cans in a cool, dry indoor pantry shelf. Use before the expiration date.
Figure 6c:
Preparation Checklist for Standard Powdered Iron-Fortified Infant Formula (using glass or hard plastic bottles)

1. Wash your hands, arms, and under your nails, very well with soap and warm water. Rinse thoroughly. Clean and sanitize your workspace.

2. Wash bottles and nipples, using bottle and nipple brushes, and caps, rings, and preparation utensils in hot soapy water before using. Rinse thoroughly.

3. Squeeze clean water through nipple holes to be sure they are open.

4. Put the bottles, nipples, caps, and rings in a pot and cover with water. Put the pot over heat, bring to a boil, and boil for 5 minutes. Remove with sanitized tongs, allow the items to cool, and air dry.

5. For formula, bring water to a very bubbly boil. Keep it boiling for a minute or two, then let it cool. Use this water to mix the formula. Use water from a source approved by the local health department. If tap water is used for boiling, collect only cold tap water allowed to run for 2 minutes first.

6. Remove plastic lid; wash lid with soap and clean water and dry it. Write date on outside of plastic lid. Wash the top of the can with soap and water, rinse well, and dry. Wash the can opener with soap and hot water. Open the can and remove scoop. Make sure that the scoop is totally dry before scooping out powdered formula. Only use the scoop that comes with the formula can.

7. For each 2 ounces of cooled boiled water added to a clean bottle, carefully add 1 level scoop of powdered formula. Thus, if 8 ounces of water is poured into the bottle, 4 level scoops of formula should be added.

8. Attach nipple and ring to the bottle and SHAKE WELL. Feed prepared formula immediately.

9. If more than one bottle is prepared, put a clean nipple right side up on each bottle and cover with a nipple cap. Label each bottle with the baby’s name and the date and time that it was prepared.

10. Refrigerate until feeding time. Use within 24 hours. Do not leave formula at room temperature. To warm bottle, hold under running warm water. Do not microwave bottles.

11. Throw out unused formula left in bottle after feeding or which has been unrefrigerated for 1 hour or more.

12. Make sure that no water or other liquid gets into the can of powder. Cover opened can tightly and store in a cool dry place (not in the refrigerator). Use within 4 weeks after opening to assure freshness.

13. To be used again, the scoop should be washed with soap and hot water, rinsed thoroughly, and allowed to air dry. When making formula again, the scoop should be totally dry before using it to scoops powder out of the can. Store unopened cans in a cool, dry indoor pantry shelf. Use before the expiration date.
Figure 6b: Preparation Checklist for Standard Liquid Concentrated Iron-Fortified Infant Formula (using glass or hard plastic bottles)

1. Wash your hands, arms, and under your nails, very well with soap and warm water. Rinse thoroughly. Clean and sanitize your workspace.

2. Wash bottles and nipples, using bottle and nipple brushes, and caps, rings, and preparation utensils in hot soapy water before using. Rinse thoroughly.

3. Squeeze clean water through nipple holes to be sure they are open.

4. Put the bottles, nipples, caps, and rings in a pot and cover with water. Put the pot over heat, bring to a boil, and boil for 5 minutes. Remove with sanitized tongs, allow the items to cool, and air dry.

5. For formula, bring water to a very bubbly boil. Keep boiling it for a minute or two, then let it cool. Use this water to mix the formula. Use water from a source approved by the local health department. If tap water is used for boiling, collect only cold tap water allowed to run for 2 minutes first.

6. Wash the top of the can with soap and water and rinse well to remove dirt. Wash the can opener with soap and hot water.

7. SHAKE CAN WELL and then open the can.

8. Pour needed amount of formula into a clean bottle using ounce markings to measure formula and add an equal amount of cooled boiled water. Thus, if 4 oz. of formula is poured into the bottle, 4 ounces of water should also be added.

9. Attach nipple and ring to the bottle and SHAKE WELL. Feed prepared formula immediately. If formula is left in the can, cover and refrigerate can until needed. Use within 48 hours.

10. If more than one bottle is prepared, put a clean nipple right side up on each bottle and cover with a nipple cap. Label each bottle with the baby's name and the date and time that it was prepared.

11. Refrigerate until feeding time. Use within 48 hours. Do not leave formula at room temperature. To warm bottle, hold under running warm water. Do not microwave bottles.

12. Throw out unused formula left in bottle after feeding or which has been unrefrigerated for 1 hour or more. Store unopened cans in a cool, dry indoor pantry shelf. Use before the expiration date.

USDA FNS Preparation Checklist for Standard Ready to Feed, Liquid Concentrate and Powdered Infant Formula, page 2 of 3
What is a Gastrostomy?

A Gastrostomy is a feeding tube placed through the skin and stomach wall directly into the stomach. If an infant cannot obtain enough nutrition by mouth, a Gastrostomy can be placed to help the infant gain the nutrition he/she needs to grow and be healthy.

Who needs a Gastrostomy?

- infants with birth defects of the mouth, esophagus, or stomach
- infants that have problems with sucking and swallowing, or who aspirate food while feeding
- infants that are on a ventilator for a long time
- infants that need supplemental feedings to gain weight

Placement of the Tube

The rubber tube is placed through a hole made in your baby’s stomach by the surgeon. The tube is sewn in place until the opening heals. Feedings are usually started slowly using the tube, 2-3 days after surgery. The original tube may be replaced with a Mic-key button 2-4 weeks after surgery, or at the time of the surgery.

Caring for the Skin around the Tube

The dressing should be changed every day or sooner if the dressing is soiled, smells badly, drainage is seen, or redness/swelling occurs. This is the best time to evaluate the condition of the skin around the tube. Once the area has healed, the dressing may only need to be changed twice per week. Dressing changes should always be done before feedings or no sooner than one hour after feedings to decrease the risk of upsetting stomach contents.

Cleaning the Site and Applying a Dressing

1. Gather supplies.
2. Wash your hands!
3. Remove the old dressing
4. Wash the skin with a clean cloth around the tube with mild soap and water starting closest to the tube and moving outward, pat dry.
5. Check skin for redness and bleeding. Watch for build-up of red or pink skin around the opening.
6. Your physician and nurse will show you the proper dressing and method to use for your child.
7. Anchor the tube to prevent it from being pulled out by the baby or by accident.

**Administering Medications**

Your physician will tell you which medications can be given through the G-tube. Ideally medications should be timed to be given with a feeding.

1. Gather supplies.
2. Wash your hands.
3. Mix the medication with 5 mL of breast milk or formula from the feeding in a sterile container and draw up mixture into a 10 ml syringe.
4. Gently push milk and medication mixture through the Gastrostomy tube.
5. After the medication is administered, connect feeding.
6. If a medication is scheduled before or after a feeding is due mix the medication with 5 mL of breast milk or formula, gently push medication through tube and then flush the tube with 5mL of sterile water.

**Feeding Using a Feeding Pump**

Please refer to the teaching tool for using the feeding pump.

**Flushing the Tube**

Flush the Gastrostomy tube after feedings and medications.

1. Using a 5 mL syringe, draw up 5mL of water.
2. Connect the syringe to end of the feeding tube and gently push the water through the tube to clear it of formula or medications.
3. If the tube becomes blocked or clogged and the water will not flush through the tube, try flushing the tube with warm water and or pulling back on the syringe. Gently repeat the pushing and pulling on the syringe until the blockage is removed.

**If the tube comes out -**

If your child’s Gastrostomy tube comes out, do not panic. Call the pediatrician as soon as possible. The stoma will not close immediately, but can close within 3 hours. (Are parents instructed on replacing the tube?)

My baby’s surgeon is _______________________.

My surgeon’s phone number is _______________________.

28
Figure. Algorithm for selection of infant and pediatric formulas.

INFANT

NO

YES

Protein Infants?

YES

>2,500 g

NO

YES

Standard protein formula (Enfamil® Premature Lipid®, Similac® Special Care® Advance or Enfamil® Iron®)

Discharge formula (Similac NeoSure® Advance, Enfamil® Enfamil® Lipid®)

Parenteral?

YES

NO

Semi-elemental whey or casein hydrolyzate pediatric formula with MCT (Pepito Pediatrica®, Nutricia® Wellness Pediatrica®)

NO

Child Ages 1 to 10 years with normal GI function

Adult enteral formulas

YES

Older than 10 years?

NO

Severe inflammation of protein allergy

100% amino acid-based elemental pediatric formula with MCT oil (Neocate® Advanced, Nestlé® Replarex, EleCare®)

YES

YES

NO

NO

Lactose-free formula (Enfamil® Lactose Free, Similac® Lactase Free Advance)

Carnitine hydrolyzate formula with MCT (Pregestimil® Lipid®, Enfamil® Alimentum® Advance)

Tolerated?

YES

NO

Standard cows' milk-based formula (Similac® Enfamil® Lipid®, Enfamil® Alimentum® Advance)

Transition to soy formula when stable (Enfamil® ProSobee® Lipid®, Enfamil® Soy A+® Advanced, Good Start® Supreme DHA/ARA)

100% amino acid formula (Neocate® Infant with DHA/ARA, Novartis Medical Nutrition, E. Hanover, Ind.)

Additional Formula Selection Considerations:

- Renal disease or obstructive uropathy
- Anemia
- Low-electrolyte-free-nutrient formula
- Lymphatic abnormalities or hyperbilirubinemia
- Infants with <50% of IBW

Gl=gastrointestinal, MCT=medium-chain triglycerides.

EleCare®, PediaSure®, Similac® Advance®, Similac® Alimentum® Advance®, Similac® Isomit® Advance®, Similac® Lactose Free Advance®, Similac NeoSure® Advance®, Similac® Special Care® Advance with Iron® Vital Jr.™ (Ross Products Division, Abbott Laboratories Inc., Columbus, Ohio)

Enfamil® Enfamil® Lipid®, Enfamil® Lactofree® Lipid®, Enfamil® Lactose Free, Enfamil® Premature Lipid®, Enfamil® Prosobee® Lipid®, Enfamil® ProSobee® Lipid®, KinderCal®, Pregestinil® Lipid® (Mead Johnson Nutritional, Evansville, Ind.)

Good Start® Supreme DHA/ARA, Good Start® Supreme Soy DHA/ARA, Peptamen Junior® (Nestlé Nutrition, Glendale, Calif.)

Neocate® Infant® with DHA/ARA, Neocate® Junior®, Neocate One+®, PediCare® Junior® (Nutricia North America, Gaithersburg, Md.)

Resource® Just For Kids® (Novartis Medical Nutrition U.S., Fremont, Mich.)
The WIC Program

WIC is a federally funded program that provides nutritious foods to supplement diets, information on healthy eating, and referrals to health care. These services are available to low-income pregnant, postpartum and breastfeeding women, to infants, and to children up to the age of five years old who are at nutritional risk. A family’s income must be <185% of the poverty level to meet the income guidelines for WIC.

The following are clinic procedures for referring families to the WIC Program:

1. Complete the WIC referral form and, as needed, the formula prescription form. Family members will then take these forms to the nearest WIC office to set up an appointment to apply for WIC. WIC forms are located in a hanging file on the back counter in the clinic work area.

2. Background information:
   a. WIC staff follows federal guidelines to determine nutritional risk status and income eligibility of individuals who apply. WIC is not an entitlement program. Congress votes on its budget annually. For that reason, funds may be limited so that not all who we believe are eligible are enrolled in the program.
   b. Generally, WIC staff determines income eligibility first and then determine nutritional risk status. Premature infants and infants/children who are failure-to-thrive will likely meet the nutrition risk criteria. An infant or child who is underweight or overweight may meet the nutrition risk criteria. Once enrolled in WIC, a person receives vouchers/checks to purchase approved foods/food package. The WIC participant is recertified every 6 months. Nutrition education and referral for health care are vital parts of the program.
   c. WIC supports breastfeeding, but for infants who are not breastfed, WIC provides infant formula. Currently, Enfamil has the contract for full-term cow’s milk and soy formulas in our area. Other infant formulas such as transitional (e.g., EnfaCare, NeoSure), or protein hydrolysate (e.g., Alimentum, Neocate, Nutramigen, Pregestimil) are available with a WIC formula prescription form. Children may also receive pediatric formulas (e.g., Kindercal, Nutren Jr., Pediasure) from WIC. For children, pregnant women, and women who are breastfeeding their infants, WIC provides foods rich in key nutrients that these groups need.
   d. WIC foods supplement the diet. For example, WIC provides approximately 26 oz/d of 20 kcal/oz full-term infant formula, most often as powder. WIC issues a quantity of formula based on usage at 20 calorie/oz for term formula and 22 calorie/ounce for transitional formula. Quantities may be insufficient for babies receiving formulas mixed to a higher concentration such as 24 kcal/oz or 27 kcal/oz.
   e. At 1 year chronological age if the infant will need a transitional, pediatric, or specialty formula, please complete a new WIC formula prescription form and give to the parent.

3. Current Rhode Island, Massachusetts, and Connecticut WIC applications, special formula forms, lists of WIC approved foods, and local WIC offices are available on the state WIC Program websites:
   a. RI WIC: www.health.ri.gov/wic
   b. MA WIC: www.mass.gov/eohhs/consumer/basic-needs/food/wic
   c. CT WIC: www.ct.gov/dph/wic
Rhode Island Department of Health  
WIC Program  
Medical Information Form for Infants & Children

Note to Health Care Provider:

Please print out this form, complete it and give it back to your patient to return to WIC.

<table>
<thead>
<tr>
<th>A. Patient Information</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Patient Name:</td>
<td>Date of Birth:</td>
</tr>
<tr>
<td>Parent/Guardian Name:</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>B. All Infants/Children</th>
<th>Infants/Children &lt; Age 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Date Obtained:</td>
<td>Birth Weight:</td>
</tr>
<tr>
<td>Weight:</td>
<td>Birth Length:</td>
</tr>
<tr>
<td>Length/Height:</td>
<td>Gestational age at birth:</td>
</tr>
<tr>
<td></td>
<td>weeks</td>
</tr>
<tr>
<td># DtaP Immunizations Given to Date:</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>C. Laboratory Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Date Collected:</td>
</tr>
</tbody>
</table>

*Hgb:  
*Hct:  
Blood Lead:  
*Required between 9-12 months and 12-24 months then once yearly (unless value < 11.1 Hgb or < 33% Hct, then required in 6 months).

<table>
<thead>
<tr>
<th>D. Health/Medical Concerns (including ICD-9 code (s))</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>E. Patient’s Health Care Provider</th>
</tr>
</thead>
<tbody>
<tr>
<td>Provider Name:</td>
</tr>
<tr>
<td>Signature:</td>
</tr>
<tr>
<td>Address:</td>
</tr>
</tbody>
</table>
Rhode Island Department of Health  
Medical Documentation for WIC Formula and Approved WIC Foods  
Infants & Children

Completion of this form is federally required to ensure that the patient under your care has a medical condition/diagnosis that requires the use of medical formula/food and/or changes to their supplemental food package.

A. Patient Information (Complete All)

<table>
<thead>
<tr>
<th>Patients Name:</th>
<th>DOB:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Parent/Guardian Name:</td>
<td></td>
</tr>
<tr>
<td>Medical Diagnosis/Qualifying Condition(s):</td>
<td></td>
</tr>
</tbody>
</table>

*** Please Note: The following non-specific symptoms are not considered acceptable medical diagnosis: Constipation, Spitting Up, Colic, Crying, Gas, Fussiness, Intolerance, or Difficulty Feeding. Any request containing these diagnosis will NOT be accepted for special formula exemptions.

B. Medical Formula/Medical Food

| Name of medical formula/medical food: | |
| Prescribed amount: | oz per day |
| Requested length of issuance: | 1 2 3 4 5 6 Months |

C. Supplemental Foods

**In addition, supplemental foods will be issued for participants over 6 months of age, unless contraindicated. Please review and select the issuance appropriate for your patient:

| WIC foods allowed – Infants 6-12 months (Please select all that apply) |
| Baby food fruits & vegetables |
| Infant cereal |
| Infant unable to take other foods at this time |

| WIC foods allowed – Children (Please select all that apply) |
| Juice |
| Eggs |
| Legumes |
| Peanut Butter |
| Cereal |
| Whole grain bread/other whole grains |

| Fruits & Vegetables |
| Cheese |

** Issue whole milk: WIC provides 1% low fat milk for all children 2 years. Only participants who need additional calories may receive whole milk.

D. Health Care Provider Information (Complete all)

| Provider’s Name (please print): | |
| Signature of health care provider: | |
| Medical office/clinic: | |
| Phone: | Fax#: | Date: |
# Rhode Island Department of Health
## WIC Program
### Medical Information Form for Breastfeeding/Postpartum Women

**Note to Health Care Provider:**

*Please print out this form, complete it and give it back to your patient to return to WIC.*

## A. Patient Information

<table>
<thead>
<tr>
<th>Name:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Date of Birth:</td>
<td></td>
</tr>
<tr>
<td>Delivery Date:</td>
<td>________________</td>
</tr>
<tr>
<td>C-Section:</td>
<td>Yes ___ No ___</td>
</tr>
</tbody>
</table>

## B. Delivery Information

<table>
<thead>
<tr>
<th>Height:</th>
<th>Date Collected:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pregestant Weight (PGW):</td>
<td>*Hgb:</td>
</tr>
<tr>
<td>Weight at Delivery:</td>
<td>*Hct:</td>
</tr>
<tr>
<td></td>
<td>*Must be collected after delivery</td>
</tr>
</tbody>
</table>

## C. Most Recent Pregnancy Outcome

<table>
<thead>
<tr>
<th>Preterm Delivery: Yes ___ No ___</th>
<th>If yes, weeks gestation:</th>
</tr>
</thead>
<tbody>
<tr>
<td>☐ LBW</td>
<td>☐ Fetal/Neonatal loss</td>
</tr>
<tr>
<td>Multiple Births: Yes ___ No ___</td>
<td></td>
</tr>
</tbody>
</table>

## D. Health/Medical Concerns (including ICD-9 code(s))

- [ ]
- [ ]
- [ ]

## E. Patient’s Health Care Provider

<table>
<thead>
<tr>
<th>Provider Name:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Signature:</td>
<td>Date:</td>
</tr>
<tr>
<td>Address:</td>
<td>Phone:</td>
</tr>
</tbody>
</table>

WIC-2 9/09
Normal and Abnormal Motor Development

The follow-up evaluation infant, particularly infants at risk, encompasses three areas of development: cognitive development, sensory function and neuromotor development. Careful and timely observation and examination of these functional domains is particularly important for infants and children at risk based on established medical conditions, prematurely, perinatal or postnatal events that might compromise establishing skills in any or all of these developmental domains. Assessment in these three areas is not exclusive as there is substantial crossover. Testing is useful on several levels. First, it provides a picture in time of development status of the child while also identifying any problems in the child’s developmental trajectory. Testing also provides information on abnormalities with varying degrees of prognostic strength. With the identification of normal and abnormal age-related developmental skills appropriate interventions can be recommended to address developmental needs.

Neuromotor evaluation including motor developmental assessment, begins at birth and uses validated models of testing to document the status of neuromotor skill and function. Motor development is generally divided into two broad areas: gross motor related to stability and function of upper and lower extremity large muscle and fine motor skills relate to hand movement.

Motor milestones are assessed based on age related gross and fine motor skills. For the purposes of the follow-up, premature infants and infants at developmental risk for other reasons will be evaluated in the newborn period and at the 1, 3, 7, 12, 24, 36 months and five year ages to correspond with follow-up scheduled. In addition the activity level, quality of movement, muscle tone and strength deep tendon reflexes and primitive reflexes are included in the assessment.

The neuromotor examination begins with an observation of baby at rest or the child involved in normal activity. Notice should be taken of any abnormal posturing, movement or behavior. Observation and general assessment should be made of spontaneous movements, including their quality and symmetry. An initial estimation of strength, tone and overall motor function should be made.

Examination of cranial nerve function should include assessment of visual fixation and tracking. Extraocular movements should be observed along with facial movements and suck, oral motor activity and swallow. Positioning of the head and neck movements for possible torticollis should be evaluated.

When checking the deep tendon reflexes, the limbs should be in a relaxed and in a symmetric position, since this can influence reflex amplitude. It is important to compare each reflex compared to the opposite limb. Deep tendon reflexes are often rated according to the following scale: 0 - absent reflex; 1+ - trace, or seen only with reinforcement; 2+ - normal; 3+ - brisk; 4+ - unsustained clonus; 5+ - sustained clonus.

Deep tendon reflexes are normal if they are 1+, 2+, or 3+ unless they are asymmetric or there is a dramatic difference between the arms and the legs. Reflexes rated as 0, 4+, or 5+ are usually considered abnormal. Ankle, patellar and bicep reflexes should be tested on all babies and children. Decreased reflexes may occur in babies with significant CNS damage, those with brain abnormalities, chromosomal disorders such as Down syndrome, spinal muscular atrophy, lower motor neuron, muscle diseases and lower motor, metabolic and endocrine disorders. These should be kept in mind during diagnostic assessment of these findings. Hyperreflexia, clonus and increased reflex response can be found in disorders such as cerebral palsy or other neurologic or biochemical disorders that lead to increased CNS irritability.
Assessment of both active and passive muscle tone should be done on all infants beginning with observation and then with specific testing of the tone. Decreased tone is found in a number of conditions including Down syndrome, chromosome anomalies, some metabolic disorders, endocrine, muscle and neurologic disorders.

**Resting Tone Term Newborn**

Term newborn infants should demonstrate good tone in flexed position. This, however, should resolve over the first few months of extra uterine life and show a more relaxed posture. Inability to develop decreasing tone may indicate hypertonia due to CNS abnormality. Both hypotonia and hypertonia require further evaluation.

**Ventral Suspension or Prone Position**

Newborn 6 Weeks 3 months 6 months

There is a typical progression of strength and head control over the first few months of postnatal life that should be monitored. Inability to establish head control may indicate either upper or lower motor neuron deficits that can be related to central nervous system injury or inherited neurologic disorders.

**Extremity Tone**

<table>
<thead>
<tr>
<th>Age</th>
<th>Scarf Sign</th>
<th>Popliteal Angle</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-2 month</td>
<td>midline</td>
<td>&gt;80°</td>
</tr>
<tr>
<td>4-6 months</td>
<td>+/- midline</td>
<td>&gt;90°</td>
</tr>
<tr>
<td>7-9 months</td>
<td>&gt; midline</td>
<td>&gt;110°</td>
</tr>
<tr>
<td>10-24 months</td>
<td>&gt; midline</td>
<td>&gt;110°</td>
</tr>
<tr>
<td>3-6 years</td>
<td>&gt;midline</td>
<td>120-160°</td>
</tr>
</tbody>
</table>

Passive tone is assessed by angles using scarf sign for upper extremities and hip abduction, heel-ear angle, popliteal angle and foot dorsiflexion to estimate lower extremity tone. The scarf sign and popliteal angel identify lateralized and bilateral tonal abnormalities.

Since fellows (and attendings) also utilize hip abduction and ankle dorsiflexion is it worthwhile to also have those angles? (ie like table 10.1 from NRN Follow Up Manual). I still refer to this at times. Also good to quantify suspect.

**PRIMITIVE REFLEXES**

Primitive reflexes are a group of automatic motor responses that are seen in infant. Most of these resolve in a specific order over time while some persist into adulthood. These reflexes may not be present in children with upper or lower motor neuron dysfunction from any of a broad group of neurologic disorders. Primitive reflexes may persist in infants with significant central nervous system damage. These reflexes may also reappear in children and adults who have suffered CNS injury from trauma or stroke.

**Rooting Reflex**
The rooting and suck reflexes are present even in premature babies and usually processed until two months of extra uterine life. However, they may persist in premature infants and resolve at two months of corrected age rather than chronologic age.

**Moro Reflex**

The Moro reflex is a generalized startle motor response that can be elicited by rapidly moving the head backwards or by loud sounds or by abrupt movement. It is characterized by a sudden outward thrusting of the arms and hands with fingers spread that is followed by specific pattern relaxation. It is present at birth tends to become less intense by two months of age and resolves my 3 to 4 months of corrected age. The Moro reflex is an indicator of general central and peripheral sensory and motor integration.

**Asymmetric tonic neck**

The tonic neck reflex is elicited by turning the infants had to either side of the infant assuming typical fencers posture. Response is related to primarily upper motor neuron function. It is present at birth and term infants. The tonic neck reflex diminishes in strength over time and usually resolves by 4 to 6 months of age. Persistence of the reflex may indicate upper motor neuron and CNS dysfunction.

**Step Reflex**

The step or walking reflex can usually be elicited in term babies by stroking the dorsum of their foot. This will cause a step like movement. This resolves rather quickly by 6 to 8 weeks after birth in term infants. It is a measure of primarily lower motor neuron function.

**Digital Grasp Reflexes**

Digital grasp occurs both in fingers and toes. The reflex can be elicited by stroking the palm of the hand or sole of the foot causing the digits to fold toward the palmer or plantar surfaces. The palmer reflex resolves gradually by five or six months of age. Plantar reflex can persist for over a year when there is delayed myelination or if central CNS deficits are present. The plantar reflex can show splaying of toes rather than folding. This would be consistent with Babinsky reflex that would indicate probable upper motor neuron dysfunction.

**Parachute Reaction**
The parachute reaction is a normal defense reflex, elicited when an infant is held in ventral suspension and is tilted abruptly forward toward the floor, seen in the 8th–12th month of age. It is characterized by protective abduction of arms, extension of elbows and wrists and spreading of fingers, a response that is asymmetrical in infants with hemiparesis and is an early sign of cerebral palsy. A normal parachute response indicates good integration of sensory, labyrinthine and motor coordination.

Postural Response Reaction

The postural response is a defensive reaction to maintain body position that has been disturbed bilateral movement of the trunk of the child seat position. The typical response is to extend the hand in the direction of disturbance. It develops gradually beginning at 6 to 8 months and is usually well-established in all directions by 11 to 12 months. It is not a primitive reflex tends to be maintained for life. Absence or asymmetry may indicate CNS, upper or lower motor neuron deficits for other motor disorders.

High-risk newborns may show abnormal responses of primitive reflexes, or lack a response entirely. Primitive reflexes in high-risk newborns may vary in response depending on the reflex with absence of reflex or with asymmetrical or atypical patterns of emergence and resolution of specific reflexes.
The assessment of both fine and gross motor developmental milestones is an essential part of the neurologic and neurodevelopmental evaluation of the child at risk. Evaluation includes observation of specific milestones as they develop over time. Fine motors skills relate to vision skills and those that relate to hand skills and manipulations. Visual fixation and tracking are established in early infancy and is maintained for life. Failure to develop visual fixation or tracking might indicate primary vision is deficits related to corneal, retinal or optic nerve disorders. It might also indicate abnormalities of the in visual nerve tracts or the visual cortex. These may also indicate severe global neurodevelopmental deficits. Skills in hand use also begin in early infancy and manifest selves usually at specific corrected ages.

Gross motor assessment focuses on areas of body control, posture and movement of large muscle groups. In early infancy the focus is on had control and development of strength. Later the ability to roll over, maintain and later obtained sitting position, standing and walking and running. This should be observed carefully during clinical examinations focusing on the ability to develop specific gross motor skills and to maintain posture and develop abilities consistent with typical motor progress in infancy and childhood. Symmetry should also be noted with the possibility of asymmetric motor function indicating CNS abnormalities such as cerebral palsy. Symmetrical loss of motor
function in lower extremities might also indicate the presence cerebral palsy or spinal cord
dysfunction. The loss of previously attained skills might indicate that child is at risk of
progressive encephalopathy that could be due to metabolic disorders or progressive
degenerative CNS disease. In addition to observation during physical examination,
periodic formal testing of motor development should be performed. In cases where either
fine or gross motor development progress is not attained or if functional abnormalities
develop the child should be referred for a complete neurologic evaluation.

Neuromotor testing is intended to provide a clinical picture in time of the state of an
infant or child's motor skill development when compared to that of typically developing age-
related peers. It is also intended to give indication of the child's strengths and weaknesses
and to identify any lags or atypical findings in a child at risk. It also serves to provide
information to establish specific diagnoses in the children with atypical development. This
would assist in establishing specific diagnoses and to indicate interventions to improve
development or to lessen the clinical impact of specific neuromotor impairments.

The general classification of neuromotor impairments falls into four categories: 1. Static
disorders, 2. Progressive or degenerative disorders, 3. Spinal cord and peripheral
nerve disorders, 4. Structural disorders.

Static disorders can include direct injury to the central nervous system in cases of
static encephalopathy that might be related to prematurely including hemorrhagic ischemic
or anoxic encephalopathy leading to cognitive and/or motor developments causing any of a
variety of motor deficits including cerebral palsy. Static disorders can also include those
that are related to chromosome defects such as Down syndrome or genetic conditions
which have an impact on cognitive and motor development that may change with time but
not of the progressive nature. Progressive disorders would include CNS conditions that
have pattern of neuronal loss or CNS degeneration such as Angelman or Rett syndromes. It
could also include metabolic disorders that have impact on neuronal survival such as
PKU or other amino acid diseases or the recycle disorders. Disorders of spinal cord and
peripheral nerves would include spina bifida, cord tethering, spinal muscular atrophy.
Structural disorders would include orthopedic disorders with missing limbs or abnormalities
of bony and supportive architecture. Also included in this group could be abnormalities
muscle function such as myopathies and muscular dystrophies.

Cerebral palsy is probably the most likely of these disorders and can be found in
prematurely born infants because of the risk of intracranial bleeds or anoxia. Likelihood of
disability occurs in children with higher levels of cerebral bleeding for injury and leads to
spasticity but often with other non-motor disorders and disabilities including seizures and
significant cognitive deficits.

The purpose of neonatal follow-up and of schedule neurodevelopmental and
neuromotor testing is to distinguish children who are making typical progress from those
who have developmental or motor disorders and disabilities. It is also intended to
information to establish specific diagnosis and provide prognostic insight. This will help
with identifying specific needs and appropriate interventions to lessen the degree of
disability and hopefully permit interventions for rent secondary disability and reduce the
likelihood of developing no further handicapping conditions.

References:
1. Lester BM, Tronick EZ, Brazelton TB. The Neonatal Intensive Care Unit Network Neurobehavioral Scale
Algorithm: Motor Delays - Early Identification and Evaluation

1. Pediatric Patient at Preventive Care Visit

2. Is this a 9-, 18-, 30- or 48-month visit?
   - NO: 3a. Perform Developmental Surveillance
   - YES: 3b. Administer Screening Tool

3a. Perform Developmental Surveillance

3b. Administer Screening Tool
   - NO: 4. Does Surveillance and/or Screening Demonstrate Neuromotor Concern?
   - YES: 5b. Consider Administering Screening Tool if Not Already Done

4. Does Surveillance and/or Screening Demonstrate Neuromotor Concern?
   - NO: 12a. Schedule Next Routine Well Child Visit
   - YES: 5a. Perform Remainder of Bright Futures Health Supervision Exam

5a. Perform Remainder of Bright Futures Health Supervision Exam

5b. Consider Administering Screening Tool if Not Already Done

6. Obtain/Review Expanded History & Perform Neurologic Exam

7. Are the History or Exam Results Concerning?
   - NO: 10. Refer to Early Intervention/Child Find & Consult/Refer to Appropriate Pediatrics Subspecialists & Perform Remainder of Bright Futures Health Supervision Exam
   - YES: 8. High, Normal or Low Tone?
     - NO: 9b. Measure CK & TSH
     - YES: 9a. Consider Neuroimaging

8. High, Normal or Low Tone?
   - NO: 12b. Identify as a Child with Special Health Care Needs & Initiate Chronic Condition Management
   - YES: 11. Is a Developmental Disorder Identified?

Legend
- Start/End
- Action/Process
- Decision

American Academy of Pediatrics
Clinical Report: Motor Delays: Early Identification and Evaluation
Garey H. Noritz, MD, Nancy A. Murphy, MD, NEUROMOTOR SCREENING EXPERT PANEL
Pediatrics Vol. 131 No. 6 June 1, 2013 pp. e2016 -e2027
Apnea and Reflux and Desaturations

Apnea of prematurity is defined as periodic breathing with pathologic apnea (apnea associated with bradycardia and/or desaturation) in a premature infant. Before 28 weeks, 100% of infants have periodic breathing (a breathing pattern of 3 or more respiratory pauses > 3 seconds with < 20 seconds of respiration between). There is also a linear relationship between increasing gestation and fewer apnea, so that pathologic apnea cease in the majority of premature infants by 36 to 37 weeks gestation. Apneic events which occur in premature infants may be central with absent breathing effort, obstructive or mixed.

- Central apnea occurs with absence of a brainstem stimulus to breathe
- Obstructive apnea occurs when there is a central effort to breathe but air flow is blocked by mucous, airway collapse, etc.
- Mixed apnea contains both central and obstructive components.

Apnea of prematurity is problematic when events are associated with bradycardia < 100 and/or the infant desaturates < 90%, and/or the infant requires stimulation to recover. Observations of pallor, cyanosis, limpness, stiffness, or unresponsiveness indicate a more serious event.

Medical management of apnea may include the use of caffeine as a respiratory stimulant which may eliminate the need for a monitor. If the infant continues to experience frequent apnea with desaturations, further identification of the underlying pathology and additional management of cardiorespiratory problems might be needed.

- If the infant is going to be discharged and events persist an apnea monitor will be ordered. Parents will need instruction in cardiorespiratory resuscitation (CPR) and use of the monitor prior to discharge.
- Parents will benefit from Health Care Company and VNA support services.
- A pneumogram may be ordered prior to discharge to assess EKG trend, respiratory effort by impedance, nasal air flow, oxygen saturation, and ph probe to assess presence of any related reflux. Areas of concern on a pneumogram include:
  1. Any apnea associated with bradycardia or desaturation.
  2. Apnea greater than 20 seconds.
  3. \( \uparrow \) periodic breathing > 5%.
  4. ph < 4.0 greater than 6% of time

Reflux should be considered as part of the differential in infants having events since it is relatively common in small premature infants, particularly those with bronchopulmonary dysplasia, increased abdominal pressure, and those receiving steroids or caffeine. Infants with reflux may have events associated with feeds or after feeds. All infants have some spitting.

- Gastro-esophageal reflux disease (GERD) is reflux with the following symptoms: arching, irritability, spit up, gasping, choking, refusal to feed, poor weight gain and respiratory distress.
- A diagnosis of reflux or GERD can be made clinically. It may be confirmed from the pneumogram if the ph drops < 4.0 for > 6% of the overnight recording and/or there are \( \geq 3 \) events of > 5 minutes duration.
Treatment for reflux includes:

1) Prone or upright positioning for 30 minutes post feeds
2) Elevation of head of bed by 30 degrees
3) Thickening of formula with oatmeal cereal (up to 1 tsp per ounce)
4) Small feeds
5) Medication options: ranitidine, omeprazole, lansoprazole, metaclopramide
6) GI consult if GERD symptoms persist

Parent recommendations for infants with a monitor:

- Parents of infants on a home monitor are instructed to keep a daily record of alarms and events and to report any events or concerns to their pediatrician.
- Continuing alarms indicate a need for re-evaluation of the monitor to check for technical problems (frequent loose leads) are necessary.
- Continuing events indicate a need for re-evaluation of the infant.
- Parents are also advised to avoid smoking in the home, fireplace smoke, high altitudes, airplane flights and exposure to anyone with a respiratory infection.

Medical management for infants with apnea

- Settings at discharge: apnea: 20 seconds; bradycardia: 80; tachycardia: 220.
- To avoid false positive bradycardia alarms, the low heart rate setting should be lowered at the following intervals:
  - < 38 weeks: 100 beats/minute
  - 38-44 weeks: 80 beats/minute
  - 1-3 months*: 70 beats/minute
  - 3-12 months* corrected age: 60 beats/minute
- Allow infants to outgrow caffeine dose naturally. If no events occur, discontinue medication. If events continue, increase dose by weight.
- Once off medication, if the infant is event free for 4 weeks discontinue the monitor.
- If parents are anxious about stopping the monitor. Suggest turning off monitor during day time hours and use only at night. Order download from home care company to be read at WIH by either Dr. Vohr or Dr. Martin Keszler. Review report, if no events, reassure parents, point out that no events occurred during the day when off monitor and discontinue monitor.
Bronchopulmonary dysplasia and the infant who goes home on Oxygen:

Definition:
Bronchopulmonary dysplasia- treatment with oxygen > 21% for > 28 days plus
(The below criteria apply to < 32 week gestation infants at 36 weeks gestational age or discharge and > 32 weeks gestation after 56 days of life or discharge)

Mild BPD – breathing room air
Moderate BPD – breathing < 30% oxygen
Severe BPD – breathing > 30 % oxygen and/or needing positive pressure needs

Infants with severe BPD, pulmonary hypertension or confounding respiratory conditions might need to be seen in the pediatric pulmonary clinic at Hasbro Children’s Hospital, in addition to the Neonatal Follow-up Clinic. Infants with severe BPD are referred to the BITS Team. For questions, contact Dr. Karen Daigle at 401 444-8059.

Epidemiology:

- ~10,000 infants each year in US are diagnosed with BPD
- Overall 20% of ventilated premature infants in the US develop BPD
- Incidence of BPD rises with decreasing birth weight
- B. wt.(500-699)gm = 85% of all infants with BPD
- B. wt.(>1500)gm    =   5% of all infants with BPD
- 2/3rd of the cases had mild respiratory distress at birth
[Kendig’s Disorders of the Respiratory Tract in Children: Seventh Edition]

Home Management

- Patients on oxygen are seen initially within 2 weeks of discharge and subsequently every 4-6 weeks.
- Parents receive CPR training and instruction in using tanks and pulse oximeter.
- Parents are provided a pulse oximeter to monitor the oxygen saturation.
- Parents keep a record of oxygen desaturations;
- Efforts are made to keep saturations ≥ 93% and parents of preterm infants with BPD, who are discharged home on oxygen, should be instructed to maintain oxygen saturations at 94-96%1,2

Evidence for maintaining Oxygen Saturations ≥ 93 % in Preterm Infants with Chronic Lung Disease on oxygen therapy After NICU Discharge

1. Oxygen saturations ≥ 93% decreased rates of SIDS
2. Oxygen saturations ≥ 93% improved weight gain
3. Oxygen saturations ≥ 95% was associated with improved catch-up growth
4. Oxygen saturations of 88-91% for ONE hour at night slowed growth rates
5. Oxygen saturations ≥ 93% decreased Pulmonary Artery Pressure
6. Oxygen saturations of 94-96% (vs 87-91%)
   a. decreased airway resistance
   b. increased lung compliance
   c. reduced work of breathing
d. decreased apnea index from 0.62 to 0.04%
e. 50% reduction in time spent <85%
7. Oxygen saturations ≥ 93% optimizes sleep architecture

**Clinic Management of BPD**

1. Obtain history of O2 needs, dietary intake, medications, and activity level

2. Physical exam with attention to pulmonary status including clinical findings, O2 saturation and growth velocity
- Goal: O2 saturation at rest ≥ 94% and adequate growth
- Check O2 saturation on current level of administered O2
- If maintained ≥ 94%, lower by 1/8 liter, check O2 after 30 minutes or with a feed or during crying to determine if O2 saturation is maintained. If so, can prescribe this new O2 flow as long as sats remain ≥ 94%, in the home setting.
- Decision to discontinue oxygen therapy or to decrease oxygen use are multifactorial and are decided on a case to case basis
- Most infants can discontinue oxygen therapy at 6-12 months of age

3. Diuretics
- Aldactone 1-3 mg/kg/day daily 1, 2, or 5mg/ml
- Diuril 20-40 mg/kg/day divided BID 50 mg/ml
- Furosemide (Lasix) 1-2 mg/kg/day q12-24hr 10mg/ml

If infant is stable, taper one at a time over 3 day periods or maintain same dosage. If infant has outgrown doses, and is stable, discontinue.

4. Bronchodilators- Albuterol MDI with valved holding chamber and mask 2 to 6 puffs as needed for asthma symptoms (90mcg/actuation) is the primary preferred delivery method; 2.5 mg nebulizer solution 1 vial via nebulizer with tight fitting mask, secondary deliver option, as needed for asthma symptoms, parents have to seek medical attention if used every 4 to 6 hours.

5. Corticoid steroids- Are effective for the treatment of asthma symptoms, i.e. reversible lower airway obstructions. They are ineffective in bronchiolitis or viral upper airway infections. The usual dose for prednisolone is 1-2 mg/Kg for 5 days and a short course of 5 days does not require a tapering dose.

6. Monitor growth velocity - Goal maintaining growth curve; achieving catch up

**Nutrition assessment - calculate intake**: Goal > 120 cal/kg/day

**References**

Bronchiolitis

This section is an outpatient adaptation of the most recent (05/2012) evidence based inpatient care guidelines for Bronchiolitis at Hasbro Children’s Hospital.

Bronchiolitis is a clinical diagnosis which affects the lower respiratory tract and causes obstruction of smaller airways in children younger than 2 years of age. This obstruction is caused by acute inflammation, edema and necrosis of epithelial cells lining small airways, increased mucus production. Bronchiolitis is initiated by a viral infection of the upper airway. There are numerous viruses which cause bronchiolitis in infants, with RSV being the most common. Bronchiolitis is a self-limited disease. The median duration of illness for children <24 months with bronchiolitis is 12 days with 20% of the children having continued respiratory symptoms after 21 days. Emergency department assessment and hospital admission for respiratory support is sometimes necessary.

Management goals for patients with bronchiolitis:

- Monitoring of clinical and respiratory status to watch for increasing work of breathing, airway obstruction, or impending respiratory failure
- Maintenance of adequate oxygenation/ventilation (oxygen saturation > 94%)
- Maintenance of adequate hydration

Suctioning
The patient should be suctioned as needed, including prior to feeds. Suctioning does cause trauma to the upper airways and results in swelling, therefore suctioning should be only performed when absolutely necessary. When suctioning is indicated, the least invasive method having therapeutic effect should be utilized with 0.9% saline solution as needed. **Use of nasal aspirator should be performed, nasopharyngeal suction or “deep suctioning” has no proven benefit and might cause laryngeal trauma. As alternative to “deep suctioning” a mechanical suctioning of the nares can be safely performed with nose suctioning adapters, such as “little suckers”.** If inhalation therapy is to be used, suctioning may allow for improved delivery of medication to lower airway.

Nasal Drops
After aggressive nasal suctioning, nasal mucosa may become inflamed creating worsening nasal obstruction and difficulty breathing. Nasal steroid drops or vasoconstrictors have been used to minimize the swelling and obstruction. While this intervention works temporarily, **its effects are short-acting and may result in rebound swelling causing more severe obstruction.** Reducing nasal suctioning will both prevent and resolve this iatrogenic insult.

Albuterol
**Routine albuterol therapy is not recommended in treatment of bronchiolitis.** Airway edema caused by bronchiolitis is not effectively treated by albuterol. Albuterol treats smooth airway muscle contractions which are the definition for asthma symptoms. A single trial of albuterol, with three consecutive albuterol doses via nebulizer or better four separate doses of 100 µg with a meter dose inhaler and valved holding chamber, may be indicated especially for an infant with a family history of allergy, atopy, or asthma, or exposure to tobacco smoke. If no **objective** improvement in respiratory status **(see Respiratory Scoring Sheet)** is noted 15-30 minutes following treatment, the therapy should not be repeated or continued. Once again, suctioning is recommended prior to respiratory
treatments. Patients with recurring albuterol responsive viral wheezing are not considered to have bronchiolitis.

Systemic Steroids

**Steroids are not indicated for bronchiolitis.** Systemic glucocorticoids (i.e. prednisolone/prednisone) have been widely given to children with viral bronchiolitis in the past. However, there is no evidence that use of oral or intravenous steroids improve clinical outcome. Physicians may consider systemic steroids in children with recurring asthma symptoms.

Antibiotics

**Bronchiolitis is a viral illness which is not affected by antibiotics.** The incidence of a bacterial infection requiring antibiotics in bronchiolitis patients is less than 2% in infants 0-60 days old and decreases further in older infants. Thus, children with the diagnosis of bronchiolitis are usually not benefited by antibiotic therapy.

Chest x-ray

**Chest radiographs are rarely indicated** in the infant with the clinical diagnosis of bronchiolitis. Transient x-ray findings consistent with the shifting atelectasis associated with bronchiolitis are likely to be misinterpreted as consolidation related to pneumonia, and may lead to unnecessary use of antibiotics. Chest radiographs may occasionally be obtained, at the physician’s discretion, in the critically ill patient, the patient with focal lung findings consistent with pneumonia, or in the patient in whom there is concern regarding bacterial super infection.

**Respiratory syncytial virus (RSV) (for parents)**

Respiratory syncytial virus (RSV) is a very common virus. RSV usually causes mild cold-like symptoms in adults and children. But premature babies or those with lung or heart problems have a high risk of getting very sick if they catch RSV early in life. This is because premature babies do not have fully developed lungs. Also, because they were born early, they may not have received virus-fighting substances (called antibodies) from their mothers that help them fight off RSV and other viruses.

Each year, an estimated 125,000 infants in the United States are hospitalized with severe RSV, the leading cause of infant hospitalization.\(^1\)\(^-\)\(^5\) Severe RSV infections may cause up to 500 infants deaths annually in the United States.\(^6\) RSV may also cause more long-term health problems, such as asthma.

RSV season usually starts in the fall and runs through the spring.\(^7\)\(^-\)\(^10\) But it can change. In some areas of the United States, RSV season may last all year. Ask your child’s healthcare provider when RSV season occurs in your area. If your baby is at high risk for RSV disease, be sure to discuss additional protective steps you can take during your baby’s next appointment. Some RSV Symptoms

Usually, RSV causes mild, cold-like symptoms, such as a runny nose and fever. However, in some babies, the symptoms can quickly get worse. Call your healthcare provider right away if your baby has any of these symptoms:

- Persistent coughing
- Wheezing
- Rapid breathing
- Problems breathing or gasping for breath
- Blue color of the lips or around the mouth
Worsening symptoms can be severe and, in some cases, life-threatening. That is why it is so important to help prevent RSV.

**Important Safety Information**

Synagis® (palivizumab) is indicated for the prevention of serious lung infections caused by respiratory syncytial virus (RSV) in children at high risk of RSV disease. Synagis is given as a shot, usually in the thigh muscle, each month during the RSV season. The first dose of Synagis should be given before RSV season begins. Children who develop an RSV infection while receiving Synagis should continue the monthly dosing schedule throughout the season. Synagis has been used in over 900,000 children in the U.S. since its introduction in 1998.

Very rare cases of severe allergic reactions such as anaphylaxis (<1 case per 100,000 patients) and rare hypersensitivity reactions have been reported with Synagis. These rare reactions may occur when any dose of Synagis is given, not just the first one. Side effects with Synagis may include upper respiratory tract infection, ear infection, fever, and runny nose. In children born with heart problems, Synagis was associated with reports of low blood oxygen levels and abnormal heart rhythms. Synagis should not be used in patients with a history of a severe prior reaction to Synagis or its components.

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**References**

American Academy of Pediatrics
RSV Prophylaxis Guidelines:
Use the chronological age to determine if the infant is a candidate for the current year.

According to the AAP\(^1\), palivizumab prophylaxis may be considered for the following infants and children

- Infants born at 28 weeks’ gestation or earlier during RSV season, whenever that occurs during the first 12 months of life
- Infants born at 29–32 weeks’ gestation if they are younger than 6 months of age at the start of the RSV season
- Infants born at 32–35 weeks’ gestation who are younger than 3 months of age at the start of the RSV season or who are born during RSV season if they have at least one of the following 2 risk factors: 1) infant attends child care; 2) infant has a sibling younger than 5 years of age
- Infants and children younger than 2 years with cyanotic or complicated congenital heart disease
- Infants and children younger than 2 years who have been treated for chronic lung disease within 6 months of the start of the RSV season.
- Infants born before 35 weeks of gestation who have either congenital abnormalities of the airway or neuromuscular disease that compromises handling of respiratory secretions.

### Respiratory Syncytial Virus (RSV) Risk Assessment Tool
#### 2014-2015 Season

<table>
<thead>
<tr>
<th>Categories: Prematurity, CLD or CHD</th>
<th>Birthday</th>
<th>Additional Criteria</th>
</tr>
</thead>
</table>
| Chronic Lung Disease < 32 wks gestation | < 1 yr old as of Nov. 2014 | ≤ 12 months of age at start of RSV Season
Baby has received medical intervention for CLD within the last 6 months. **Examples of therapies include oxygen, bronchodilator, diuretic, or corticosteroid therapy.** |
| Congenital Heart Disease regardless of GA | < 1 yr old as of Nov. 2014 | ≤ 12 months of age at start of RSV Season; consult cardiology recommended
“Hemodynamically significant CHD” |
| Prematurity: Gestational Age < 29 weeks | < 1 yr as of Nov.2014 | ≤ 12 months of age at onset of RSV season |
| Chronic Lung Disease < 32 wks | Between 1 to 2 yrs of age by Nov. 2014 | **Who require ongoing medical treatment for CLD with supplemental oxygen, diuretic or steroid therapy** |
| Congenital pulmonary or neuromuscular disease infants ≥ severe immunocompromise | < 2 yrs of age by Nov. 2014 | Disease compromises respiratory secretions |

### Other Evidence-Based Risk Factors for Severe RSV Disease¹

- Attends day care (Definition: ≥ 2 unrelated children for ≥ 4 hr/week)
- Preschool or School-aged siblings
- Young Chronological Age: ≤ 12 weeks of age at start of RSV Season
- Exposure to environmental air pollutants
- Low birth weight of < 2500g
- Multiple births
- Family history of asthma
- Crowded living conditions
- Neuromuscular disease
- Congenital airway abnormalities

¹. References available upon request
The MedImmune Assistance Program (MAP) Process Flow

I. Call Hotline (877-778-9010) to request an application.
   a. Please have the patient’s name, DOB, address, residency information (US citizen, legal alien) as a minimum to get the process started.
   b. A physician office must complete an application for each patient.

II. Application will be faxed (866-252-1749) to the requesting office for the parents and the office staff to complete.
   a. Please make sure the entire application is complete including the signature of the parent/guardian in BOTH sections of the last page.

III. FAX completed application AND a copy of the treating physician’s state license OR DEA certificate back to the Hotline for processing at 866-252-1749.
   a. The MedImmune Assistance Program needs a copy of the actual state license or DEA certificate prior to shipping product for approved patients.
   b. The address on these documents must match the delivery address for the Synagis® (palivizumab) shipment.
   c. This is an FDA regulation.
   d. The state license/DEA certificate will only need to be sent to the hotline once until the certificate expires.

IV. The MedImmune Assistance Program will process the application.
   a. MAP counselors will follow up with the site for missing information if needed.
   b. Complete applications are processed within 48 hours.

V. A determination will be faxed to the site once the application has been processed.
   a. Approval letters will include a Product Request Form (PRF).

VI. MAP is a temporary program to assist patients while they access coverage sources.
   a. MAP Counselors will research alternate coverage resources during the processing of the application.
   b. Those patients determined to be potentially eligible for alternate coverage, (i.e. Medicaid, private insurance, Title VI, etc.) must apply for alternate insurance.
   c. MAP counselors will continue to check the patient’s status every month to ensure the patient has applied for the alternate coverage until a determination by the alternate coverage option is made.
   d. Once a patient has been approved for the alternate coverage, and coverage for Synagis has been confirmed, the patient will be transitioned off of MAP.
   e. Patients that are denied coverage through the identified alternate source will remain on MAP.

VII. Complete the Product Request Form (PRF) and fax back to the Hotline to schedule shipment of Synagis for the approved patient.
   a. The PRF must be completed (including a physician’s signature), and faxed to the hotline prior to each injection on a monthly basis. Sites are responsible for completion of this form. Sites are encouraged to fax the PRF at least 1 week prior to the scheduled injection date.

VIII. Shipment delivery time is 2 business days.
   a. Shipments arrive via Fed Ex.
IX. Important Contact Information

**MedImmune Representatives:** (RI community pediatrics) Don Wright 401-265-8706

(RI/CT hospitals) Tina Fredericksen 860-614-6250
(Field Reimbursement Manager) Jamie Klein 617-388-3008

**Customer Support Network MedImmune:** medical, safety & product info 1-877-633-4411

**Reimbursement Hotline:** 1-877-480-8082

**MedImmune Assistance Program:**
Temporary assistance with MedImmune products 1-877-480-8082

**Local Distributors:**
Option Care/Walgreens: Contact Person: Cristina Ferreira
66 Amaral Street
East Providence, RI. 02915
Phone: 401-431-1300 ext. 3058 Fax: 401-431-1303
E mail: Cristina.ferrerira@wallgreens.com
Universal Newborn Hearing Screening, Diagnosis, and Intervention
GUIDELINES FOR RHODE ISLAND PEDIATRIC MEDICAL HOME PROVIDERS

**BIRTH SCREEN**
Identify a medical home for every infant
RIHAP: 401-277-3700

- Hospital-based Inpatient Screening (OAE/AABR) Results available to PCP on KIDSNET
  - At least 2 screening attempts recommended prior to discharge

**BEFORE 1 MONTH**
RE-SCREEN RIHAP

- Outpatient Screening (OAE/AABR) Results sent to PCP
  - Missed, incomplete, DID NOT PASS RIHAP contacts family and schedules outpatient screen

**BEFORE 3 MONTHS**

- Pediatric Audiologic Evaluation
  - Otoscopic inspection
  - Child & family history
  - Middle ear function
  - OAE
  - ABR
  - Frequency-specific tone bursts
  - Air & bone conduction
  - Audiologist counsels parents about results and recommendations
  - RIHAP can be contacted for a list of Pediatric Audiology providers at 401-277-3700, Fax 401-276-7613

- Audiologist reports diagnosis to RIHAP: 401-277-3700

- Audiologist refers directly for early intervention & family support: Early Intervention Coordinator, 401-331-1350 x3462

**BEFORE 6 MONTHS**
CONTINUED FOLLOW-UP: Every child identified with a permanent hearing loss

- Continued enrollment in early intervention services

- Medical Evaluations
to determine etiology and identify related conditions
  - Genetic
  - Ophthalmologic (annually)
  - Developmental Pediatrics, Neurology, Cardiology, and Nephrology (as needed)

- Pediatric Audiological Services
  - Hearing aid fitting and monitoring
  - Behavioral audiometry (starting at age 6 months)
  - Ongoing monitoring

**ONGOING CARE OF ALL INFANTS FROM THE MEDICAL HOME PROVIDER**
- Provide parents with information about hearing, speech, and language development
  - Identify and aggressively treat middle ear disease
  - Provide ongoing developmental surveillance and screening with a validated tool at 9, 18, & 24-30 months and refer to appropriate resources
  - Identify and refer for audiological monitoring infants who have the following risk indicators for late-onset hearing loss:
    - Caregiver concern regarding hearing, speech, language and/or developmental delay
    - Neonatal indications: NICU stay for >5 days, ECMO, assisted ventilation, exposure to ototoxic medications (gentamicin & tobramycin) or loop diuretics (furosamide/Lasix) and hypothyroidism that requires exchange transfusion
    - In utero infections: CMV, herpes, rubella, syphilis, and toxoplasmosis
    - Cytopenic anomalies, including those that involve the pineal, ear, yellow, ear tags, ear pits, and temporal bone anomalies
    - Physical findings, such as white forelock, that are associated with a syndrome known to include a sensorineural or permanent conductive hearing loss
    - Syndromes associated with hearing loss or progressive or late-onset loss such as neurofibromatosis, osteogenesis imperfecta, and Usher syndrome; other frequently identified syndromes include Wiedemann-Beckwith, Alport, Pendred, and Pendred and Longhi-Martinelli
    - Neurodegenerative disorders: Hunter syndrome, sensory motor neuropathies, Friedreich ataxia and Charcot-Marie-Tooth disease
    - Culture-positive postnatal infections associated with sensorineural hearing loss including confirmed bacterial and viral meningsitis and especially herpes virus and varicella
    - Head trauma especially basal skull/temporal bone fracture that requires hospitalization
    - Chemotherapy

**NOTES**
- Bold indicates highest factor
- Red indicates primary care provider (PCP) action points
  1. RIHAP=Rhode Island Hearing Assessment Program
  2. OAE=Otoacoustic Emission
  3. AABR=Automated Auditory Brainstem Response
  4. ABR=Auditory Brainstem Response
  5. Home births, or infants at high risk for HI, (ie, NICU) may be referred directly to a pediatric audiology
  6. Early Intervention Hearing Coordinator: 401-331-1350 x3462
  7. Family Guidance Program: 401-222-3525

**For a current list of Early Intervention Providers go to**
www.chs.ri.gov/chs/FamilyGuide/early_intervention.htm

and click on resources for a list of providers.
<table>
<thead>
<tr>
<th>DEGREE OF HEARING LOSS</th>
<th>POSSIBLE EFFECT OF HEARING LOSS ON THE UNDERSTANDING OF LANGUAGE AND SPEECH</th>
<th>POTENTIAL EDUCATIONAL NEEDS AND PROGRAMS</th>
</tr>
</thead>
</table>
| NORMAL HEARING -10 - +15 dB HL | Children have better hearing sensitivity than the accepted normal range for adults.  
Children with hearing sensitivity in the -10 to +15dB range detect the complete speech signal even at conversation levels. | Noise in typical classroom environments impede child from having full access to teacher instruction. Will benefit from improved acoustic treatment of classroom and sound-field amplification.  
• Favorable seating necessary.  
• May often have difficulty with sound/letter associations and subtle auditory discrimination skills necessary for reading.  
• May need attention to vocabulary or speech, especially when there has been a long history of middle ear fluid.  
• Depending on loss configuration, may benefit from low power hearing aid with personal FM system.  
• Appropriate medical management necessary for conductive losses.  
• Inservice on impact of “minimal” 16 – 25 dB hearing loss on language development, listening in noise and learning, required for teacher. |
| SLIGHT HEARING LOSS 16-25 dB HL | Impact of hearing loss that is approximately 20 dB can be compared to ability to hear when index fingers are placed in your ears.  
• Child may have difficulty hearing faint or distant speech. At 16 dB student can miss up to 10% of speech signal when teacher is at a distance greater than 3 feet.  
• A 20 dB or greater hearing loss in the better ear can result in absent, inconsistent or distorted parts of speech, especially word endings (s, ed) and un-emphasized sounds.  
• Percent of speech signal missed will be greater whenever there is background noise in the classroom, especially in the elementary grades when instruction is primarily verbal and younger children have greater difficulty listening in noise.  
• Young children have the tendency to watch and copy the movements of other students rather than attending to auditory fragmented teacher directions. |  

| MILD 26-40 dB HL | • Effect of a hearing loss of approximately 20 dB can be compared to ability to hear when index fingers are placed in ears.  
• A 26 – 40 dB hearing loss causes greater listening difficulties than a "plugged ear" loss.  
• Child can "hear" but misses fragments of speech leading to misunderstanding.  
• Degree of difficulty experienced in school will depend upon noise level in the classroom, distance from the teacher, and configuration of the hearing loss, even with hearing aids.  
• At 30 dB, can miss 25-40% of the speech signal.  
• At 40 dB may miss 50% of class discussions, especially when voices are faint or speaker is not in line of vision.  
• Will miss un-emphasized words and consonants, especially when a high frequency hearing loss is present.  
• Often experiences difficulty learning early reading skills such as letter/sound associations.  
• Child’s ability to understand and succeed in the classroom will be substantially diminished by speaker distance and background noise, especially in the elementary grades. | • Noise in typical class will impede child from full access to teacher instruction.  
• Will benefit from hearing aid(s) and use of a desk top or ear level FM system in the classroom.  
• Needs favorable acoustics, seating and lighting.  
• May need attention to auditory skills, speech, language development, speechreading and/or support in reading and self-esteem.  
• Amount of attention needed typically related to the degree of success of intervention prior to 6 months of age to prevent language and early learning delays.  
• Teacher in-service on impact of a 26 – 40 dB hearing loss on listening and learning to convey that it is often greater than expected. |
| MODERATE 41-55 dB HL | Consistent use of amplification and language intervention prior to age 6 months increases the probability that the child’s speech, language and learning will develop at a normal rate. Without amplification, child may understand conversation at a distance of 3-5 feet, if sentence structure and vocabulary are known.  
• The amount of speech signal missed can be 50% or more with 40 dB loss and 80% or more with 50 dB loss.  
• Without early amplification, the child is likely to have delayed or disordered syntax, limited vocabulary, imperfect speech production and flat voice quality.  
• Addition of a visual communication system to supplement audition may be indicated, especially if language delays and/or additional disabilities are present.  
• Even with hearing aids, child can "hear" but may miss much of what is said if classroom is noisy or reverberant.  
• With personal hearing aids alone, ability to perceive speech and learn effectively in the classroom is at high risk. A personal FM system to overcome classroom noise | Consistent use of amplification (hearing aids + FM) is essential.  
• Needs favorable classroom acoustics, seating and lighting.  
• Consultation/program supervision by a specialist in childhood hearing impairment to coordinate services is important.  
• Depending on early intervention success in preventing language delays, special academic support will be necessary if language and educational delays are present.  
• Attention to growth of oral communication, reading, written language skills, auditory skill development, speech therapy, self-esteem likely.  
• Teacher in-service required with attention to communication access and peer acceptance. |
<table>
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<tr>
<th>MODERATELY-SEVERE</th>
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<tr>
<td>56-70 dB HL</td>
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</table>

Even with hearing aids, child will typically be aware of people talking around him/her, but will miss parts of words said resulting in difficulty in situations requiring verbal communication (both one-to-one and in groups).

- Without amplification, conversation must be very loud to be understood; a 55 dB loss can cause a child to miss up to 100% of speech information without functioning amplification.
- If hearing loss is not identified before age one year and appropriately managed, delayed spoken language, syntax, reduced speech intelligibility and flat voice quality is likely.
- Age when first amplified, consistency of hearing aid use and early language intervention strongly tied to success of speech, language and learning development.
- Addition of visual communication system often indicated if language delays and/or additional disabilities are present.
- Use of a personal FM system will reduce the effects of noise and distance and allow increased auditory access to verbal instruction.
- With hearing aids alone, ability to understand in the classroom is greatly reduced by distance and noise.

| Full time, consistent use of amplification (hearing aids + FM system) is essential. |
| • May benefit from frequency transposition (frequency compression) hearing aids depending upon loss configuration. |
| • May require intense support in development of auditory, language, speech, reading and writing skills. |
| • Consultation/supervision by a specialist in childhood hearing impairment to coordinate services is important. |
| • Use of sign language or a visual communication system by children with substantial language delays or additional learning needs, may be useful to access linguistically complex instruction. |
| • Note-taking, captioned films, etc. often are needed accommodations. |
| • Teacher in-service required. |
| SEVERE 71-90 dB HL | The earlier the child wears amplification consistently with concentrated efforts by parents and caregivers to provide rich language opportunities throughout everyday activities and/or provision of intensive language intervention (sign or verbal), the greater the probability that speech, language and learning will develop at a relatively normal rate.
  • Without amplification, children with 71-90 dB hearing loss may only hear loud noises about one foot from ear.
  • When amplified optimally, children with hearing ability of 90 dB or better should detect many sounds of speech if presented from close distance or via FM.
  • Individual ability and intensive intervention prior to 6 months of age will determine the degree that sounds detected will be discriminated and understood by the brain into meaningful input.
  • Even with hearing aids children with hearing loss greater than 70 dB may be a candidate for cochlear implant(s) and the child with hearing loss greater than 90 dB will not be able to perceive most speech sounds with traditional hearing aids.
  • For full access to language to be available visually through sign language or cued speech, family members must be involved in child’s communication mode from a very young age. |
| --- | --- |
|  | There is no one communication system that is right for all hard of hearing or deaf children and their families.
  • Whether a visual communication approach or Auditory/oral approach is used, extensive language intervention, full-time consistent amplification use and constant integration of the communication practices into the family by 6 months of age will highly increase the probability that the child will become a successful learner.
  • Children with late-identified hearing loss (i.e., after 6 months of age) will have delayed language.
  • This language gap is difficult to overcome and the educational program of a child with hearing loss, especially those with language and learning delays secondary to hearing loss, requires the involvement of a consultant or teacher with expertise in teaching children with hearing loss.
  • Depending on the configuration of the hearing loss and individual speech perception ability, frequency transposition aids (frequency compression) or cochlear implantation may be options for better access to speech.
  • If an auditory/oral approach is used, early training is needed on auditory skills, spoken language, concept development and speech.
  • If culturally deaf emphasis is selected, frequent exposure to Deaf, ASL users is important.
  • Educational placement with other signing deaf or hard of hearing students (special school or classes) may be a more appropriate option to access a language-rich environment and free-flowing communication.
  • Support services and continual appraisal of access to communication and verbal instruction is required.
  • Note-taking, captioning, captioned films and other visual enhancement strategies are necessary; training in pragmatic language use and communication repair strategies helpful.
  • In-service of general education teachers is essential. |
### PROFOUND

**91+ dB HL**

Aware of vibrations more than tonal pattern. Many rely on vision rather than hearing as primary avenue for communication and learning. Detection of speech sounds dependent upon loss configuration and use of amplification. Speech and language will not develop spontaneously and is likely to deteriorate rapidly if hearing loss is of recent onset.

May need special program for children who are deaf and hard of hearing with emphasis on all language skills and academic areas. Program needs specialized supervision and comprehensive support services. Early use of amplification likely to help if part of an intensive training program. May be cochlear implant or vibrotactile aid candidate.

### UNILATERAL HL

#### ONE NORMAL EAR ONE PERMANENT

Child can "hear" but can have difficulty understanding in certain situations, such as hearing faint or distant speech, especially if poor ear is aimed toward the person speaking.

- Will typically have difficulty localizing sounds and voices using hearing alone.
- The unilateral listener will have greater difficulty understanding speech when environment is noisy and/or reverberant, especially when normal ear is towards the overhead projector or other competing sound source and poor hearing ear is towards the teacher.
- Exhibits difficulty detecting or understand-ning soft speech from the side of the poor hearing ear, especially in a group discussion.

Allow child to change seat locations to direct the normal hearing ear toward the primary speaker.

- Student is at 10 times the risk for educational difficulties as children with 2 normal hearing ears and 1/3 to 1/2 of students with unilateral hearing loss experience significant learning problems.
- Children often have difficulty learning sound/letter associations in typically noisy kindergarten and grade 1 settings.
- Educational and audiological monitoring is warranted.
- Teacher inservice is beneficial.
- Typically will benefit from a personal FM system with low gain/power or a sound-field FM system in the classroom, especially in the lower grades.
- Depending on the hearing loss, may benefit from a hearing aid in the impaired ear.

### NOTE:

All children require full access to teacher instruction and educationally relevant peer communication to receive an appropriate education.
Distance, noise in classroom and fragmentation caused by hearing loss prevent full access to spoken instruction. Appropriate acoustics, use of visuals, FM amplification, sign language, notetakers, communication partners, etc. increase access to instruction. Needs periodic hearing evaluation, rigorous amplification checks, and regular monitoring of access to instruction and classroom function (monitoring tools at www.hear2learn.com or www.SIFTERanderson.com).

TITLE 40
Human services

CHAPTER 40-11
Abused and Neglected Children

SECTION 40-11-1

§ 40-11-1 Policy. – The public policy of this state is: to protect children whose health and welfare may be adversely affected through injury and neglect; to strengthen the family and to make the home safe for children by enhancing the parental capacity for good child care; to provide a temporary or permanent nurturing and safe environment for children when necessary; and for these purposes to require the mandatory reporting of known or suspected child abuse and neglect, investigation of those reports by a social agency, and provision of services, where needed, to the child and family.

TITLE 40
Human services

CHAPTER 40-11
Abused and Neglected Children

SECTION 40-11-2

§ 40-11-2 Definitions. – When used in this chapter and unless the specific context indicates otherwise:

(1) “Abused and/or neglected child” means a child whose physical or mental health or welfare is harmed or threatened with harm when his or her parent or other person responsible for his or her welfare:

(i) Inflicts, or allows to be inflicted upon the child physical or mental injury, including excessive corporal punishment; or

(ii) Creates or allows to be created a substantial risk of physical or mental injury to the child, including excessive corporal punishment; or

(iii) Commits or allows to be committed, against the child, an act of sexual abuse; or

(iv) Fails to supply the child with adequate food, clothing, shelter, or medical care, though financially able to do so or offered financial or other reasonable means to do so; or

(v) Fails to provide the child with a minimum degree of care or proper supervision or guardianship because of his or her unwillingness or inability to do so by situations or conditions such as, but not limited to, social problems, mental incompetency, or the use of a drug, drugs, or alcohol to the extent that the parent or other person responsible for the child’s welfare loses his or her ability or is unwilling to properly care for the child; or

(vi) Abandons or deserts the child; or

(vii) Sexually exploits the child in that the person allows, permits or encourages the child to engage in prostitution as defined by the provisions of chapter 34 of title 11, entitled “Prostitution and Lewdness”; or
(viii) Sexually exploits the child in that the person allows, permits, encourages or engages in the obscene or pornographic photographing, filming or depiction of the child in a setting which taken as a whole suggests to the average person that the child is about to engage in or has engaged in, any sexual act, or which depicts any such child under eighteen (18) years of age, performing sodomy, oral copulation, sexual intercourse, masturbation, or bestiality; or

(ix) Commits or allows to be committed any sexual offense against the child as such sexual offenses are defined by the provisions of chapter 37 of title 11 entitled “Sexual Assault”, as amended; or

(x) Commits or allows to be committed against any child an act involving sexual penetration or sexual contact if the child is under fifteen (15) years of age; or if the child is fifteen (15) years or older, and (1) force or coercion is used by the perpetrator, or (2) the perpetrator knows or has reason to know that the victim is a severely impaired person as defined by the provisions of § 11-5-11, or physically helpless as defined by the provisions of § 11-37-6.

(2) “Child” means a person under the age of eighteen (18).

(3) “Child protective investigator” means an employee of the department charged with responsibility for investigating complaints and/or referrals of child abuse and/or neglect and institutional child abuse and neglect.

(4) “Department” means department of children, youth, and families.

(5) “Institutional child abuse and neglect” means situations of known or suspected child abuse or neglect where the person allegedly responsible for the abuse or neglect is a foster parent or the employee of a public or private residential child care institution or agency; or any staff person providing out-of-home care or situations where the suspected abuse or neglect occurs as a result of the institution’s practices, policies, or conditions.

(7) “Law enforcement agency” means the police department in any city or town and/or the state police.

(8) “Mental injury” includes a state of substantially diminished psychological or intellectual functioning in relation to, but not limited to, such factors as: failure to thrive; ability to think or reason; control of aggressive or self-destructive impulses; acting-out or misbehavior, including incorrigibility, ungovernability, or habitual truancy; provided, however, that the injury must be clearly attributable to the unwillingness or inability of the parent or other person responsible for the child's welfare to exercise a minimum degree of care toward the child.

(9) “Person responsible for child’s welfare” means the child’s parent, guardian, foster parent, an employee of a public or private residential home or facility, or any staff person providing out-of-home care (out-of-home care means child day care to include family day care, group day care, and center-based day care).

(10) “Physician” means any licensed doctor of medicine, licensed osteopathic physician, and any physician, intern, or resident of an institution as defined in subdivision (5).

(11) “Probable cause” means facts and circumstances based upon as accurate and reliable information as possible that would justify a reasonable person to suspect that a child is abused or neglected. The facts and circumstances may include evidence of an injury or injuries, and the statements of a person worthy of belief, even if there is no present evidence of injury.
DCYF Reporting

The Division of Child Protective Services is comprised of Child Protective Investigations and Screening/Intake. Child Protection Investigations consists of twelve (12) units of Child Protective Investigators who specialize in the investigation of child abuse and neglect cases. This program operates 24 hours a-day, 7 days-a-week and responds to allegations of child abuse or neglect state-wide. During the course of an investigation, Child Protective Investigators determine if there is a preponderance of evidence that a child has been abused or neglected and if so, what actions are necessary to protect the child from further harm. If, upon completion of the investigation, a preponderance of evidence indicates that a child has been abused/neglected, then the case is “Indicated” (substantiated). If a child is deemed to be in imminent risk of harm, s/he can be removed from the home and placed in the care of the State by the Child Protective Investigator (CPI) for a period of forty-eight (48) hours. This “hold” allows the investigator the opportunity to investigate further and meet with the Department’s legal counsel to prepare the necessary petitions for presentation to the Rhode Island Family Court. Screening/Intake consists of five (5) casework units which handle the intake of all other non-child abuse/neglect cases to the Department as well as reviewing all indicated Child Protective Services (CPS) investigations.

If you know or suspect that a child is being abused or neglected, report it immediately to DCYF. As a matter of fact, the law requires that you do so within 24 hours. The Child Abuse Hotline, (1-800-742-4453), is staffed 24 hours a day, seven days a week by professional Child Protective Investigators.
# COMMONLY PRESCRIBED MEDICATIONS

<table>
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<tr>
<th>Medication</th>
<th>Dose</th>
<th>Interval</th>
<th>Concentration</th>
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<tr>
<td><strong>Diuretics</strong></td>
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<tr>
<td>Diuril (Chlorothiazide)</td>
<td>20-40mg/kg/day</td>
<td>Divided q12</td>
<td>50mg/ml</td>
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<tr>
<td>Aldactone (Spironolactone)</td>
<td>1-3 mg/kg/day</td>
<td>Daily</td>
<td>1, 2, 3 or 5mg/ml (compounded)</td>
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<tr>
<td>Lasix (Furosemide)</td>
<td>1-2 mg/kg/day</td>
<td>Daily</td>
<td>10 mg/ml</td>
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<td><strong>Apea Control</strong></td>
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<tr>
<td>Caffeine Citrate</td>
<td>Load 20mg/kg</td>
<td>Daily</td>
<td>20mg/ml</td>
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<td>Maintenance 5-10mg/kg</td>
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<tr>
<td><strong>Bronchodilators</strong></td>
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<tr>
<td>Albuterol MDI</td>
<td>1-2 puffs (180-540mcg)</td>
<td>Every 4-6 hours</td>
<td>90mcg/actuation</td>
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<tr>
<td>Albuterol Nebulizer</td>
<td>0.05-0.15 mg/kg/dose</td>
<td>Every 4-6 hours</td>
<td>0.5% solution</td>
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<td><strong>CONSTIPATION AIDES</strong></td>
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<tr>
<td>MiraLAX (polyethylene Glycol 3350)</td>
<td>0.5 g /kg</td>
<td>Once per day</td>
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<td>Prune/Pear juice</td>
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<tr>
<td>Lactulose (Enulose,Generlac)</td>
<td>10 cc PO</td>
<td>Once per day</td>
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<td>1.7 to 6.7 gms/day (2.5 -10 cc/d)</td>
<td>3-4 x/day</td>
<td>May increase to 3 x /d</td>
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<tr>
<td><strong>Corticosteroids</strong></td>
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<tr>
<td>Flovent (Fluticasone) oral inhalation</td>
<td>44 mcg/puff x 2</td>
<td>2-4 x /day</td>
<td>Via face mask and spacer 10.6 g/device</td>
</tr>
<tr>
<td>Pulmicort (budesonide)</td>
<td>0.25-0.5mg</td>
<td>Daily</td>
<td>0.25, 0.5 or 1mg neb</td>
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<td><strong>ANTICONVULSANTS</strong></td>
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<tr>
<td>Dilantin (phenytoin)</td>
<td>5-8mg/kg/day</td>
<td>Divided 2-3 times/d</td>
<td>125mg/5ml</td>
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<tr>
<td>Phenobarbital</td>
<td>3-6mg/kg/day</td>
<td>Daily or divided bid</td>
<td>20mg/5ml</td>
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<tr>
<td>Keppra (levetiracetam)</td>
<td>10mg/kg/dose</td>
<td>BID</td>
<td>100mg/ml</td>
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<tr>
<td><strong>Antibiotics</strong></td>
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<tr>
<td>Amoxicillin treatment</td>
<td>25-50mg/kg/day</td>
<td>Divided BID</td>
<td>125 or 250mg/5ml</td>
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<tr>
<td>Amoxicillin prophylaxis</td>
<td>25mg/kg/day</td>
<td>Daily</td>
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<tr>
<td><strong>Reflux</strong></td>
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<tr>
<td>Reglan (metaclopramide)</td>
<td>0.1-0.2mg/kg/dose</td>
<td>3-4 times daily</td>
<td>5mg/5ml</td>
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<tr>
<td>Zantac (ranitidine)</td>
<td>2mg/kg/dose</td>
<td>2 to 3 x /day</td>
<td>15mg/ml</td>
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<tr>
<td>Prilosec (omeprazole)</td>
<td>1mg/kg/day</td>
<td>Daily or divided BID</td>
<td>2mg/ml (compound)</td>
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<tr>
<td>Maalox/Mylanta</td>
<td>1-2 ml/kg/dose (max 15ml)</td>
<td>4-6 times daily</td>
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<tr>
<td>Prevacid (lansoprazole)</td>
<td>0.5–1.0mg/kg/day</td>
<td>BID or QD</td>
<td>(not under 6 months)</td>
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<tr>
<td>Medication</td>
<td>Dose</td>
<td>Interval</td>
<td>Concentration</td>
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<tr>
<td><strong>RSV</strong></td>
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<tr>
<td>Synagis</td>
<td>15mg/kg</td>
<td>IM monthly</td>
<td>RSV season Code med, asthma</td>
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<tr>
<td>Epinephrine</td>
<td>0.01 mg/kg</td>
<td>ETT,IM,or IV</td>
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<tr>
<td><strong>Secretions</strong></td>
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<tr>
<td>Robinul (glycopyrrolate)</td>
<td>40-100mc/kg/dose</td>
<td>3-4 x/day</td>
<td>Solution= 1mg/5 cc</td>
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<td>Aka Cuvposa</td>
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<tr>
<td><strong>Candida treatments</strong></td>
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<tr>
<td>Oral thrush</td>
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<tr>
<td>Nystatin</td>
<td>200,000 to 400,000units per dose</td>
<td>4 x per day</td>
<td>Suspension = 100,000 units per cc ( comes in 5cc and 60 cc sizes)</td>
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<tr>
<td><strong>Candida treatments</strong></td>
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<tr>
<td>Oral thrush</td>
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<td>4 x per day</td>
<td>Suspension = 100,000 units per cc ( comes in 5cc and 60 cc sizes)</td>
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<tr>
<td><strong>Skin candida</strong></td>
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<tr>
<td>Fluconazole (Diflucan)</td>
<td>Day 1 : 6 mg/kg</td>
<td>Once per day</td>
<td>Minimum duration of therapy is 14 days</td>
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<td>Day 2-14 : 3 mg/kg</td>
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<tr>
<td><strong>Skin candida</strong></td>
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<tr>
<td>Topical Nystatin powder</td>
<td>100,000 units / g</td>
<td>4 x per day</td>
<td>Comes in 15 g,30g and 60 g sizes</td>
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<tr>
<td>Nystatin Ointment/cream</td>
<td>100,000 units / g</td>
<td>4 x per day</td>
<td>Comes in 15 g or 30 g</td>
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<tr>
<td><strong>Pulmonary Hypertension</strong></td>
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<tr>
<td>Sildenafil (Viagra)</td>
<td>0.25-0.5 mg/kg/dose</td>
<td>Every 4 to 8 hrs</td>
<td>Increase dose as needed /tolerated to 1 mg/kg/dose q 4-8 hrs</td>
</tr>
</tbody>
</table>
# Recommendations for Preventive Pediatric Health Care (RE9535)

**Committee on Practice and Ambulatory Medicine**

Each child and family is unique; therefore, these Recommendations for Preventive Pediatric Health Care are designed for the care of children who are receiving competent parenting, have no manifestations of any important health problems, and are growing and developing in satisfactory fashion. Additional visits may become necessary if circumstances suggest variations from normal.

These guidelines represent a consensus by the Committee on Practice and Ambulatory Medicine in consultation with national committees and sections of the American Academy of Pediatrics. The Committee emphasizes the great importance of continuity of care in comprehensive health supervision and the need to avoid fragmentation of care.

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<tr>
<th>AGE*</th>
<th>PRENATAL</th>
<th>NEONATAL*</th>
<th>0-4M</th>
<th>6-11M</th>
<th>12-23M</th>
<th>24-35M</th>
<th>36-47M</th>
<th>48-59M</th>
<th>60-71M</th>
<th>72-64M</th>
<th>65-96M</th>
<th>97-120M</th>
<th>121-144M</th>
<th>145-168M</th>
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<td>HISTORY</td>
<td>Initial</td>
<td>Follow-up</td>
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<td>SENSORY SCREENING</td>
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<td>Hematocrit/Metabolic Screening</td>
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<td>Immunization</td>
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<td>Perinatal or Hemoglobin</td>
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<td>Lirvalia</td>
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1. A parent and child are recommended for prenatal care. The father and child should undergo appropriate prenatal care, and a discussion of benefits of breastfeeding and planned method of delivery should be included.
2. Every child should have a standard examination after birth. The exam should include: weight, height, length, sex, birth defects, and a full discussion of the child's development.
3. At each visit, a complete physical examination is essential, with special attention to the child's growth and development.
4. The child should be weighed and measured at each visit to assess growth and development.
5. The child should be examined for any signs of infection or disease.
6. The child should be examined for any signs of musculoskeletal problems, such as torticollis.
7. The child should be examined for any signs of dental problems.
8. The child should be examined for any signs of hearing loss.
9. The child should be examined for any signs of visual problems.
10. The child should be examined for any signs of developmental delays.
11. The child should be examined for any signs of behavioral problems.
12. The child should be examined for any signs of nutritional problems.
13. The child should be examined for any signs of emotional problems.
14. The child should be examined for any signs of sleep problems.
15. The child should be examined for any signs of injury or violence.
16. The child should be examined for any signs of dental problems.
17. The child should be examined for any signs of auditory problems.
18. The child should be examined for any signs of visual problems.
19. The child should be examined for any signs of developmental delays.
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21. The child should be examined for any signs of nutritional problems.
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62. The child should be examined for any signs of auditory problems.
63. The child should be examined for any signs of visual problems.
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66. The child should be examined for any signs of nutritional problems.
67. The child should be examined for any signs of emotional problems.
68. The child should be examined for any signs of sleep problems.
69. The child should be examined for any signs of injury or violence.
70. The child should be examined for any signs of dental problems.
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<td>Boostrix Tdap</td>
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<td>MCV4 (Meningococcal conjugate)</td>
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<td>HPV4* (Human papillomavirus)</td>
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1 Refer to CDC’s 2014 Recommended Childhood and Adolescent Immunization Schedule for vaccinating high risk children: [http://www.cdc.gov/vaccines/schedules/hcp/imz/child-adolescent.html](http://www.cdc.gov/vaccines/schedules/hcp/imz/child-adolescent.html)

2 This schedule lists state-supplied childhood vaccines and is consistent with the recommended age range of CDC’s Childhood and Adolescent Immunization Schedule ([http://www.cdc.gov/vaccines/schedules/hcp/child-adolescent.html](http://www.cdc.gov/vaccines/schedules/hcp/child-adolescent.html)). CDC recommendations for individual vaccines are available at [www.cdc.gov/vaccines/recs/default.htm](http://www.cdc.gov/vaccines/recs/default.htm).

3 State-supplied HPV4 vaccine is recommended for routine use in males and females beginning at 11-12 years with catch-up vaccination through 18 years of age.

Note: This schedule outlines routine vaccination and does not reflect any current vaccine shortages.

Revised 6/2014
### Home Health Care Companies: Supplies, Monitors, Etc.

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<tr>
<th>Company</th>
<th>Address</th>
<th>Phone Numbers</th>
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<tr>
<td><strong>Apria Health Care - RI</strong></td>
<td>70 Catamore Blvd, Suite 200</td>
<td>(401) 435-8500</td>
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<tr>
<td></td>
<td>East Providence, RI 02914</td>
<td>(800) 992-9411 - RI</td>
</tr>
<tr>
<td></td>
<td></td>
<td>FAX: (781) 762-9301</td>
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<tr>
<td><strong>Apria Health Care - MA</strong></td>
<td>345 Greenwood Street, Suite 3</td>
<td>(508) 949-7800</td>
</tr>
<tr>
<td></td>
<td>Worcester, MA 01607</td>
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<tr>
<td><strong>Apria Health Care - MA</strong></td>
<td>575 University Ave, Suite 4</td>
<td>(800) 649-2422</td>
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<td></td>
<td>Norwood, MA 02062</td>
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<tr>
<td><strong>Vanguard Home Medical Equipment - RI</strong></td>
<td>155 Jefferson Blvd.</td>
<td>(401) 468-1300</td>
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<tr>
<td></td>
<td>Warwick, RI 02888</td>
<td>(800) 696-3000</td>
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<tr>
<td></td>
<td></td>
<td>FAX: (401) 633-6736 or (401) 468-1333</td>
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<tr>
<td><strong>Denmarks Home Medical - MA</strong></td>
<td>1451 Concord Street</td>
<td>(617) 244-2701</td>
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<td></td>
<td>Framingham, MA 01701</td>
<td>(800) 669-1970</td>
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<td></td>
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<td>FAX: (508) 564-6349</td>
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<tr>
<td><strong>Denmarks Home Medical - MA</strong></td>
<td>9 Jonathan Bourne Drive</td>
<td>(508) 563-2203</td>
</tr>
<tr>
<td></td>
<td>Poscasset, MA 02559</td>
<td>(800) 479-5511</td>
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<tr>
<td></td>
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<td>FAX: (508) 564-4095</td>
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<tr>
<td><strong>Advantage Home Medical Equipment – MA</strong></td>
<td>575 E. Washington Street</td>
<td>(508) 699-2090</td>
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<td></td>
<td>North Attleboro, MA 02760</td>
<td>(800) 969-2090</td>
</tr>
<tr>
<td></td>
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<td>FAX: (508) 699-5932</td>
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<tr>
<td><strong>Claflin Medical Equipment – RI</strong></td>
<td>P.O. Box 6887</td>
<td>(401) 732-9150</td>
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<tr>
<td></td>
<td>Warwick, RI 02887</td>
<td>(800) 338-2372</td>
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<td>FAX: (888) 685-5455</td>
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<tr>
<td><strong>Respiratory Solutions – RI</strong></td>
<td>24 Albion Road</td>
<td>(401) 333-1500</td>
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<td></td>
<td>Lincoln, RI 02865</td>
<td>(866) 455-0500</td>
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<tr>
<td><strong>New England Home Therapies</strong></td>
<td>337 Turnpike Road</td>
<td>(508) 480-8409</td>
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<td></td>
<td>Southborough, MA 01772</td>
<td>(800) 966-2487</td>
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<td></td>
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<td>FAX: (508) 480-0724</td>
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AUDITORY BRAINSTEM RESPONSE TESTING (ABR)
Rhode Island

UNSEDATED TESTING
(0 - 3 months corrected age)

**Providence**
Alliance Hearing & Balance Center
849 North Main St, Suite 2
(401) 861-7293

RI Hospital Audiology/Speech
115 Georgia Ave
(401) 444-5485

Women & Infants Hospital
Dept of Audiology
134 Thurbers Ave, Suite 215
(401) 453-7751

SEDATED TESTING
(3 months and older corrected age)

**Providence**
RI Hospital Audiology/Speech
Hasbro Childrens Hospital
593 Dudley St
(401) 444-5485

*Please verify audiological assessment coverage with your health insurance*
Visual Reinforcement Audiometry Testing (VRA) for infants over 6 months, toddlers & children

Rhode Island

**Bristol**
Aquidneck Hearing Center
567 Metacom Ave, Unit 6
(401) 254-4327

**Cranston**
Atlantic Hearing Center
1150 Reservoir Ave, Suite 305B
*ages 3 and over
(401) 942-8080

**East Greenwich**
University Otolaryngology
1351 South County Trail, Suite 303
(401) 885-8484

**Johnston**
Rhode Island Audiology
1395 Atwood Ave, Suite 104
*ages 5 and over
(401) 946-7660

**Kingston**
University of Rhode Island
Dept of Communicative Disorders
3071 Kingstown Rd
(401) 874-4742

**Lincoln**
Hear For You Hearing & Balance Center
6 Blackstone Valley Place, Bldg 3, Ste 307
(401) 475-6116

**Middletown**
Aquidneck Hearing Center
850 Aquidneck Ave, Unit B-9
(401) 849-4448

Eve Health Vision Center
73 Valley Rd
*ages 4 and over
(401) 849-4448

**Pawtucket**
Memorial Hospital
111 Brewster St
(401) 729-2022

Rhode Island Audiology
727 East Ave
*ages 5 and over
(401) 946-4660

RI Ear Nose & Throat
333 School St
*ages 2 and over
(401) 728-0140

**Providence**
Alliance Hearing & Balance Center
849 North Main St, Suite 2
(401) 861-7293

RI Hospital Audiology/Speech
115 Georgia Ave
(401) 444-5485

*RI Hearing Center
RI School for the Deaf
1 Corliss Park
(401) 222-3525

University Otolaryngology
130 Waterman St
(401) 274-3277

University Otolaryngology
118 Dudley St
(401) 274-2300

Women & Infants Hospital
Dept of Audiology
134 Thurbars Ave, Suite 215
(401) 453-7751

**Smithfield**
Hearing Health Care Connections
10 Smith Avenue
(401) 949-1100

Twin Rivers Hearing Health
151 Douglas Pike
*ages 3 and over
(401) 349-0456

**Wakefield**
Atlantic Hearing Center
24 Salt Pond Road, Bldg H-2
*ages 3 and over
(401) 942-8080

University Otolaryngology
116 Main St
(401) 782-4400

**Warwick**
Audiology Rehabilitation Services
200 Tolgitge Rd, Suite 203
*ages 6 and over
(401) 461-3965

Hear Care Rhode Island
200 Tolgitge Rd, Suite 203
*ages 6 and over
(401) 737-1760

**Woonsocket**
RI Audiology
148 Social St
*ages 3 and over
(401) 767-3034

**Westerly**
ENT Associates of Westerly
17 Wells St, Suite 201
(401) 595-2033

*Free evaluations at
Rhode Island School for the Deaf

please verify audiological assessment coverage with your health insurance

/auditory assessment/wp51/forms/
# Audiological Assessment/Diagnostic Centers List

**Massachusetts**

## LEVEL ONE AND TWO (SERVE BIRTH AND UP)

<table>
<thead>
<tr>
<th>Location</th>
<th>Address</th>
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<tr>
<td>Baystate Medical Center</td>
<td>Rehabilitation Services/Audiology</td>
<td>360 Birnie Avenue</td>
<td>Springfield, MA 01107</td>
</tr>
<tr>
<td>Beverly Hospital</td>
<td>Center for Communication Disorders</td>
<td>85 Herrick Street</td>
<td>Beverly, MA 01915</td>
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<tr>
<td>Boston Children's Hospital</td>
<td>Audiology Program</td>
<td>333 Longwood Avenue, 3rd Floor</td>
<td>Boston, MA 02115</td>
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<tr>
<td>Boston Children's Hospital at Waltham</td>
<td>Audiology Program</td>
<td>9 Hope Avenue</td>
<td>Waltham, MA 02453</td>
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<tr>
<td>Boston Children's Hospital North</td>
<td>Audiology Program</td>
<td>10 Centennial Drive</td>
<td>Peabody, MA 01960</td>
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<tr>
<td>Franciscan Hospital for Children</td>
<td>Speech/Language-Hearing Department</td>
<td>36 Warren Street</td>
<td>Boston, MA 02135</td>
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<tr>
<td>HealthAlliance Hospital – Burbank</td>
<td>Speech &amp; Hearing</td>
<td>275 Nichols Road</td>
<td>Fitchburg, MA 01420</td>
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<tr>
<td>Massachusetts Eye and Ear Infirmary</td>
<td>Audiology Department</td>
<td>243 Charles Street</td>
<td>Boston, MA 02114</td>
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<td>Mercy Medical Center</td>
<td>Weldon Hearing Center</td>
<td>231 Carew Street</td>
<td>Springfield, MA 01104</td>
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<tr>
<td>Morton Hospital</td>
<td>Speech, Hearing &amp; Language Center</td>
<td>2007 Bay Street, Suite B-100</td>
<td>Taunton, MA 02780</td>
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<tr>
<td>North Shore Medical Center</td>
<td>Audiology Services</td>
<td>738 Cambridge Street, SMC 8</td>
<td>Brighton, MA 02135</td>
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<tr>
<td>St. Elizabeth's Medical Center</td>
<td>Audiology Program</td>
<td>800 Washington Street</td>
<td>Boston, MA 02215</td>
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**LEVEL THREE (SERVE 6 MTHS AND UP)**

**Baystate Rehabilitation Care**  
48 Sanderson Street  
Greenfield, MA 01301  
413-773-2227 V

**Clarke Schools**  
Center for Audiological Services  
45 Round Hill Road  
Northampton, MA 01060  
413-582-1114 V

**Harvard Vanguard Medical Center**  
Audiology  
26 City Hall Mall  
Medford, MA 02155-4765  
781-306-5255 V

**Harvard Vanguard Medical Center**  
Audiology  
1250 Hancock Street  
Quincy, MA 02169-4339  
617-774-0750 V

**Holyoke Medical Center**  
Speech and Hearing Center  
575 Beach Street  
Holyoke, MA 01040  
413-534-2508

**Spaulding Rehabilitation Hospital**  
Audiology  
311 Service Road  
East Sandwich, MA 02537  
508-833-4141 V

**Harvard Vanguard Medical Center**  
Audiology  
228 Billerica Road  
Chelmsford, MA 01824-3004  
781-250-6040 V

**Harvard Vanguard Medical Center**  
Audiology  
230 Worcester Street  
Wellesley, MA 02181-5491  
781-431-5255 V

**St. Luke's Hospital**  
Audiology  
Mashpee Rehabilitation Building  
49 State Road  
North Dartmouth, MA 02747

**The Learning Center for the Deaf**  
Audiology Unit  
848 Central Street  
Framingham, MA 01701  
508-875-4559 V
Audiological Assessment/Diagnostic Centers List
Connecticut

FARMINGTON
Connecticut Children’s Medical Center
Audiology Department
505 Farmington Ave.
1st Floor
Farmington, CT 06032
(860) 545-9642
Medical facility affiliation for sedation:

HARTFORD
Connecticut Children’s Medical Center
Audiology Department
282 Washington Street
Hartford, CT 06106
(860) 545-9642
Medical facility affiliation for sedation:

STORRS
University of Connecticut
Speech & Hearing Clinic
850 Bolton Road
Unit 1085
Storrs, CT 06269-1085
(860) 486-2629

GLASTONBURY
Connecticut Children’s Medical Center
Glastonbury Satellite Office
310 Western Blvd.
Glastonbury, CT 06033
(860) 545-9642
Medical facility affiliation for sedation:

NEW HAVEN
ENT Medical & Surgical Group
46 Prince Street
New Haven, CT 06519
(203) 752-1726

WATERFORD
Lawrence & Memorial at Waterford
Outpatient Rehabilitation Services
40 Boston Post Road
Waterford, CT 06385
(860) 271-4900

HAMDEN
Hearing, Balance & Speech Center
2681 Dixwell Avenue
Hamden, CT 06518
(203) 287-9915

NEW HAVEN
Yale New Haven Hospital
Yale Hearing & Balance Center 800
Howard Ave, 4th Floor
New Haven, CT 06519
(203) 785-2467
Medical facility affiliation for sedation:
Rhode Island Parent Information Network (RIPIN)
Peer Resource Specialists/ Parent Consultants
A Program Sponsored by the RI Department of Health AND the Dept. of Human Services

Early Intervention (EI) Parent Consultants

Deborah Masland/ Director 401.270.0101 x113 masland@ripin.org
Tammy Russo/Early Childhood Program Coordinator - 401.270.0101 x116 russo@ripin.org
Margaret Greene-Bromell/EC Supervisor – 401.270.0101 x162 greene-bromell@ripin.org

Children’s Friend & Service
621 Dexter Street
Central Falls, RI 02863
401-721-9200
FAX: 401-729-0010

Community Care Alliance
(Formerly Family Resources Community Action)
245 Main Street
Woonsocket, RI 02895
401-766-0900
FAX: 401-766-8737

Family Service of RI
134 Thurbers Ave
Providence, RI 02905
401-331-1350
FAX: 401-277-3388

Hasbro Children’s Hospital
335R Prairie Avenue
Providence, RI 02904
401-444-3201
Referral Line: 401-444-3201
FAX: 401-444-8507

J. Arthur Trudeau Memorial Center
250 Commonwealth Avenue
Warwick, RI 02886
401-823-1731
FAX: 401-823-1849

Southern Office
25 West Independence Way
Kingston, RI 02881
401-284-1980
Fax: 401-284-1979
James L. Maher Center
120 Hillside Avenue
Newport, RI 02840
401-848-2660
FAX: 401-847-9459

Meeting Street
1000 Eddy Street
Providence, RI 02905
401-533-9100
Referral Line: 401-533-9104
FAX: 401-533-9102

Easter Seals of RI
213 Robinson St
Wakefield, RI 02879
401-284-1000
FAX: 401-284-1006

Seven Hills
178 Norwood Ave
Cranston, RI 02905
401-921-1470
FAX: 401-762-0837

30 Cumberland Street
Woonsocket, RI 02895
401-597-6700
FAX: 401-762-0837

Looking Upwards
2974 East Main Road
Portsmouth, RI 02871
401-293-5790
FAX: 401-293-5796

The Groden Center (EI)
30 Livingston Street
Providence, RI 02904
401-274-6310

Executive Office of Health & Human Services (EOHHS)
Center for Child and Family Health
Hazard Building #74
74 West Road
Cranston, RI 02920
Part C Coordinator and Chief, Family Health Systems: Brenda DuHamel 401-462-0318

Director: Deborah Shears x123
Parent Consultant: Lynette Kapsinow x118 or 680-3203

Director: Casey Ferrara 533-9252
Supervisor: Jennifer Demello 533-9210
Supervisor: Antonio Martins 533-9261
Supervisor: Amanda Silva Boisvert 533-9172
Parent Consultant: Pamela Doner 533-9266
Parent Consultant: Cris Faxas 533-9244
faxas@ripin.org

Director: Sue Hawkes x11
Supervisor: Tara McGarty x12
Parent Consultant: Amy Ortiz x15

Director: Laurie Farrell x7206
Supervisor: Lynne Gilpatrick X7213
Supervisor: Linda Hughes x7214
Parent Consultant: None

Director: A. Valory McHugh x330
Supervisor: Carolyn Souza x310
Parent Consultant: None

Director: Leslie Weidenman 274-6310 x1006
Supervisor: Carol LaFrance 525-2380
Parent Consultant: Susan Barnatowicz 477-6743