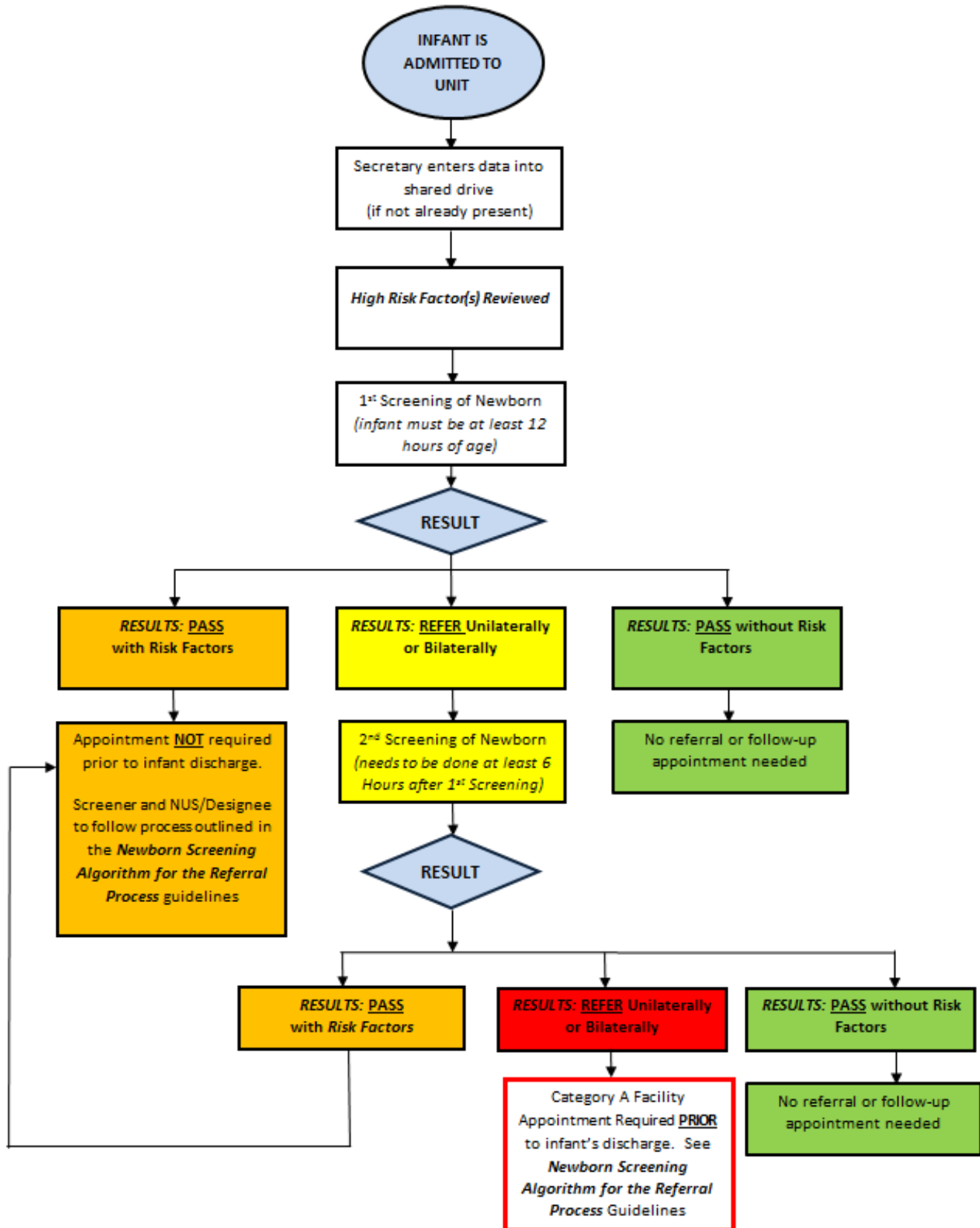
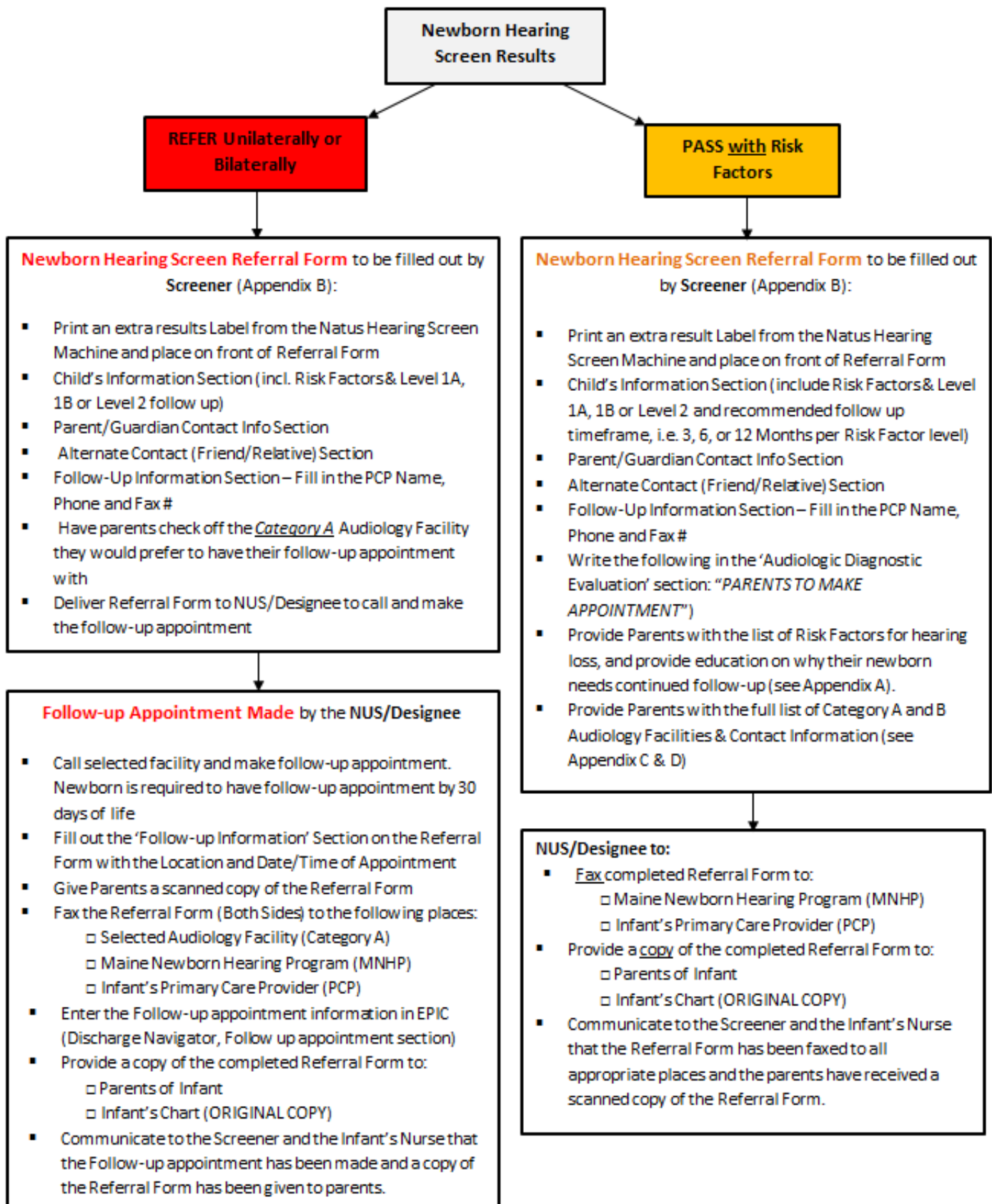


NEWBORN HEARING SCREENING ALGORITHM MAINE MEDICAL CENTER



Newborn Hearing Screen Algorithm for the Referral & Appointment Process



Appendix A

Risk Indicators for Hearing Loss

RISK INDICATORS ASSOCIATED WITH PERMANENT CONGENITAL, DELAYED-ONSET, OR PROGRESSIVE HEARING LOSS IN CHILDHOOD

*Risk indicators that are marked with an asterisk * are of greater concern for delayed-onset hearing loss.*

- Caregiver concern regarding hearing, speech, language, or developmental delay*
- Family history* of permanent childhood hearing loss
- Neonatal intensive care of more than (>) 5 days; or, any of the following regardless of length of stay:
 - ECMO*, assisted ventilation greater than or equal to (\geq) 5 days*, exposure to ototoxic medications (gentamycin and tobramycin), loop diuretics (furosemide/Lasix), or chemotherapy, and hyperbilirubinemia that requires exchange transfusion
- In utero infections, such as CMV*, herpes, rubella, syphilis, and toxoplasmosis
- Craniofacial anomalies, including those that involve the pinna, ear canal, 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 hearing loss*, such as neurofibromatosis, osteopetrosis, and Usher syndrome; other frequently identified syndromes include Waardenburg, Alport, Pendred, and Jervell and Lange-Nielson
- Neurodegenerative disorders*, such as Hunter syndrome, or sensory motor neuropathies, such as Friedreich ataxia and Charcot-Marie-Tooth syndrome
- Culture-positive postnatal infections associated with sensorineural hearing loss, including confirmed bacterial and viral (especially herpes viruses and varicella) meningitis*
- Head trauma, especially basal skull/temporal bone fracture* that requires hospitalization
- Chemotherapy
- Severe birth asphyxia
- Hyperbilirubinemia without transfusion (at risk for Auditory Neuropathy Spectrum Disorder)

References

- Hille, E.T., van Straaten, H.I., Verkerk, P.H. (2007). Prevalence and independent risk factors for hearing loss in NICU infants. *Acta Paediatrica*, 96(8): 1155-1158.
- Joint Committee on Infant Hearing (JCIH). (2007). Year 2007 position statement: principles and guidelines for early hearing detection and intervention programs. *Pediatrics*, 120, 898-921.
- Stich-Hennen, J., Barga, G.A. (2015). Risk monitoring for late onset hearing loss. In National Center for Hearing Assessment and Management (NCHAM) eBook: *A resource guide for early hearing detection & intervention (EHDI)*. <http://infantheating.org/ehdi-ebook/>.

Monitoring Infants with Risk Factors for Hearing Loss

Level 1A Risk Factors	Level 1B Risk Factors
<ul style="list-style-type: none"> • Family history of permanent childhood hearing loss • In-utero infections (CMV, herpes, rubella, toxoplasmosis, syphilis) • Culture positive postnatal infection (bacterial meningitis, sepsis) • Craniofacial or temporal bone anomalies (cleft lip/palate, atresia, ear tags/pits) • Severe birth asphyxia • Mechanical ventilation • Hyperbilirubinemia with transfusion • Multiple risk factors from any level • ECMO • Chemotherapy 	<ul style="list-style-type: none"> • Syndromes associated with progressive hearing loss (Neurofibromatosis, Osteopetrosis, Usher syndrome, Waardenburg Syndrome, Pendred Syndrome, Alport Syndrome, Lange-Neilson Syndrome) • Neurodegenerative disorders or sensory motor neuropathies (Hunter Syndrome, Friedrich ataxia, Charcot-Marie-Tooth Syndrome) • Head Trauma, especially of the basal skull and temporal bone fractures • Very low Birth Weight (<1500 g) • Respiratory Distress • Bronchiopulmonary dysplasia
Level 2 Risk Factors	
<ul style="list-style-type: none"> • Ototoxic medication exposure (any amount) with no other risk factors • Low birth weight (1500-2500 g) with no other risk factors • Prematurity (<37 weeks) with no other risk factors • NICU stay greater than 5 days • Hyperbilirubinemia without transfusion (at risk for Auditory Neuropathy Spectrum Disorder) 	

***Caregiver concern for hearing, speech, language, or developmental delay should indicate necessity for a diagnostic audiological evaluation at the time of concern.**

Level 1A Risk Factors: If the infant falls within this category, and has passed the newborn screening, it is recommended the baby is referred for a full diagnostic evaluation by **3 months**. Frequent follow up is recommended.

Level 1B Risk Factors: If the infant falls within this category, and has passed the newborn screening, it is recommended the baby is referred for a full diagnostic evaluation by **6 months**. Frequent follow up is recommended.

Level 2 Risk Factors: If the infant falls within this category, and has passed the newborn screening, it is recommended the child be referred for a full diagnostic evaluation by **12 months**, and no later than 20-24 months.

**Routine follow-up thereafter is as the discretion of the audiologist/PCP*

References:

- Bielecki, I., Horbulewicz, A., Wolan, T. (2011) Risk factors associated with hearing loss in infants: an analysis of 5282 referred neonates. *International Journal of Pediatric Otorhinolaryngology*, 75(7), 925-930.
- Cone-Wesson, B., Vohr, B.R., Sininger, Y.S., Widen, J.E., Folsom, R.C., Gorga, M.P., & Norton, S.J. (2000). Identification of neonatal hearing impairment: Infants with hearing loss. *Ear and Hearing*, 21, 488-507.
- Fligor, B.J., Neault, M.W., Mullen, C.H., Feldman, H.A, Jones, D.T. (2005). Factors associated with sensorineural hearing loss among survivors of extracorporeal membrane oxygenation therapy. *Pediatrics*, 115(6), 1519-1528
- Joint Committee on Infant Hearing (2007) Year 2007 Position Statement: Principles and Guidelines for Early Hearing Detection and Intervention Programs. *Pediatrics*, 120(4), 898-921
- Marlow, E., Hunt, L., Marlow, N. (2000) Sensorineural hearing loss and prematurity. *Archives of Disease in Childhood: Fetal and neonatal Edition*, 82(2)F141-F144.
- Stich-Hennen, J., Barger, G.A. (2015). Risk monitoring for late onset hearing loss. In National Center for Hearing Assessment and Management (NCHAM) eBook: *A resource guide for early hearing detection & intervention (EHD)*. <http://infantheating.org/ehdi-ebook/>.

Appendix B

Patient Label



- Audiology Office
- MNHP
- PCP office

Faxed by: _____ Date: _____

Newborn Hearing Screen Referral

Child's Information

Name: _____ Date of Birth (MM/DD/YYYY): _____

Birth Facility: _____ Screen Facility (if different): _____

Hearing Screen Date (MM/DD/YYYY): ____/____/____ (Only enter information on most RECENT screen)

Result (circle for each ear) **Right Ear:** Pass Refer N/A **Left Ear:** Pass Refer N/A

Risk Factor(s): _____ Risk Level (circle): 1A Level 1B Level 2

Recommended follow up to be set up by Parents: 3 months (level 1A) 6 months (level 1B) 12 months of age (level 2)

Parent/Guardian Contact Information

Name: _____

Address: _____

Phone #: (____) _____ Alternate#: (____) _____

*Alternate Contact (Friend/Relative)

Name: _____ (Relation to Child): _____

Phone #: (____) _____ Alternate#: (____) _____

Follow-up Information (Please check all applicable boxes)

- Audiologic Diagnostic Evaluation (audiology appointment) scheduled:
Location: _____ Phone : (____) _____
Date & Time: _____
- Hearing Screen results provided to primary care provider
PCP Name: _____ Phone: (____) _____
Fax: (____) _____
- Refusal for follow-up screening/audiological assessment
(Complete refusal form and fax both referral and refusal forms to MNHP and PCP)

Audiology Evaluation Facilities Infants

Portland

- Maine Medical Partners ENT 1250 Forest Avenue Portland, ME 04103 P: (207) 797-5753 F: (207) 797-9571
- MKMENT Associates 43 Baxter Blvd Portland, ME 04101 P: (207) 535-115 F: (207) 775-337

- Northeast Hearing & Speech 75 West Commercial Street, Suite 205 P: (207) 874-1065 F: (207) 874-1068

Lewiston

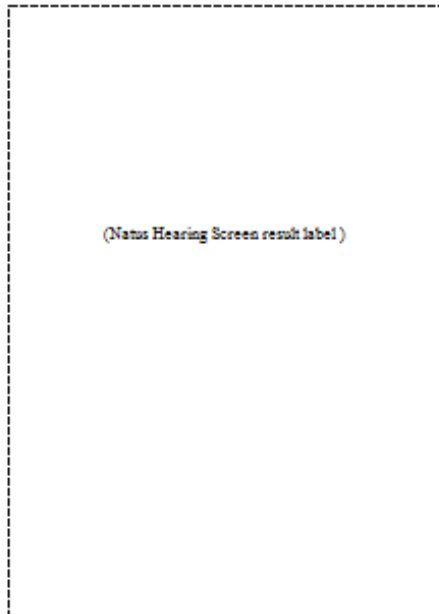
- Central Maine Hearing Center 12 High Street, Suite 102 Lewiston, ME 04240 P: (207) 786-9949 F: (207) 786-9948
- L/A Hearing Center 72 Strawberry Ave Lewiston, ME 04240 P: (207) 782-2150 F: (207) 782-3621

Bangor

- Eastern Maine Medical Center 905 Union St, Suite 10 Bangor, ME 04401 P: (207) 973-7365 F: (207) 973-5246
- Warren Center /PCHC 922 Union Street, Suite 3 Bangor, ME 04401 P: (207) 941-2850 F: (207) 941-2852

Waterville

- Maine General Medical Center 149 North St Waterville, ME 04901 P: (207) 872-4383 F: (207) 872-4222



(Natus Hearing Screen result label)

*MNHP Fax (207) 287-4743

Appendix C



Paul R. LePage, Governor

Mary C. Mayhew, Commissioner

Maine CDC Newborn Hearing Program
Division of Population Health, Department of Health & Human Services

AUDIOLOGY EVALUATION FACILITIES FOR INFANTS

Infants who do not pass newborn hearing screening should be referred to one of these category A facilities for a full audiological diagnostic evaluation.

CATEGORY A			
<p>These facilities have indicated they provide full audiological diagnostic evaluation (this includes ABR with frequency specific results) recommended by the MNHP for infants birth to 6 months who are referred from hearing screening programs. (#) = facility has indicated medical center affiliation for sedated testing, if needed.</p>			
<p><u>BANGOR</u> Eastern Maine Healthcare Mall (#) 905 Union St, Suite 10 Bangor ME 04401 Phone: (207)973-7365 Fax: (207)973-5246</p>	<p><u>BANGOR</u> Warren Center/PCHC 992 Union Street, Suite 3 Bangor ME 04401 Phone: (207)404-8080 Fax: (207)941-2852</p>	<p><u>LEWISTON</u> Central Maine Hearing Center 12 High Street, Suite 102 Lewiston, ME 04240 Phone: (207) 786-9949 Fax: (207) 786-9948</p>	<p><u>LEWISTON</u> L/A Hearing Center 72 Strawberry Ave Lewiston, ME 04240 Phone: (207) 782-2150 Fax: (207) 782-3621</p>
<p><u>PORTLAND</u> Maine Medical Partners ENT (#) 1250 Forest Avenue Portland, ME 04103 Phone: (207) 797-5753 Fax: (207) 797-9571</p>	<p><u>PORTLAND</u> MKM ENT Associates 43 Baxter Blvd Portland, ME 04101 Phone: (207) 535-1150 Fax: (207) 775-3378</p>	<p><u>PORTLAND</u> Northeast Hearing and Speech 75 West Commercial Street, Suite 205 Portland, ME 04101 Phone: (207) 874-1065 Fax: (207) 874-1068</p>	<p><u>WATERVILLE</u> Maine General Medical Center 149 North St Waterville, ME 04901 Phone : (207) 872-4383 Fax: (207) 872-4222</p>

These facilities also provide testing for children over 6 months of age

Facility information is accurate as of June 2015. Information may change due to changes in staffing and diagnostic capacity. Please notify the Maine Newborn Hearing Program with any corrections and updates. (207) 287-8427

Appendix D



Maine CDC Newborn Hearing Program
Division of Population Health, Department of Health & Human Services
PEDIATRIC AUDIOLOGICAL FACILITIES

CATEGORY B
These facilities have indicated they provide pediatric audiological testing procedures for children over 6 months of age with services including, but not limited to, soundfield testing, screening prior to electrophysiological testing, otoacoustic emission testing, and support services for hearing aid fitting. (*) = facility able to provide high frequency tympanometry testing.

<p><u>Augusta</u> Maine General Medical Center 12 Shuman Ave, Unit 4 Augusta ME 04330 Phone: (207) 622-8680 Fax: (207) 622-8681</p>	<p><u>BANGOR</u> Eastern Maine Healthcare Mall (*) 905 Union Street, Suite 10 Bangor, ME 04401 Phone: (207) 973-7365 Fax: (207) 973-5246</p>	<p><u>BANGOR</u> Warren Center/Penobscot Community Health Center (*) 992 Union Street, Suite 3 Bangor, ME 04401 Phone: (207) 404-8080 Fax: (207) 941-2852</p>	<p><u>BATH</u> Pine Tree Society (*) 149 Front Street Bath, ME 04530 Phone: (207) 443-3341 Fax: (207) 443-1795</p>	<p><u>BELFAST</u> Hearing Solutions 147 Northport Avenue Belfast, ME 04915 Phone: (207) 338-6770 Fax: (207) 338-3488</p>
<p><u>BELFAST</u> Waldo County General Hospital Audiology Dept. (*) 118 Northport Avenue Belfast, ME 04915 Phone: (207) 930-2660 Fax: (207) 930-2690</p>	<p><u>BIDDEFORD</u> Maine Medical Partners, ENT (*) 6 Wellspring Rd Biddeford, ME 04005 Phone: (207) 284-6673 Fax: (207) 294-7365</p>	<p><u>BIDDEFORD</u> MKM ENT Associates 413 Alfred Street, Suite 201 Biddeford, ME 04005 Phone: (207) 282-2202 Fax: (207) 284-1241</p>	<p><u>BRIDGTON</u> Maine Medical Partners, ENT 55 Main Street Bridgton, ME 04009 Phone: (207) 642-2144 Fax: (207) 743-0214</p>	<p><u>ELLSWORTH</u> Audiology Center of Maine, LLC, PA (*) 77 Beechland Road Ellsworth, ME 04605 Phone: (207) 664-2123 Fax: (207) 667-0706</p>
<p><u>GORHAM</u> Village Hearing Care, P.A. (*) 347 Main Street, Suite 1A Gorham, ME 04038 Phone: (207) 839-8400 Fax: (866) 596-0877</p>	<p><u>KITTERY</u> Family Ear, Nose and Throat (*) 35 Walker St, Suite 200 Kittery, ME 03904 Phone: (207) 351-3524 Fax: (207) 654-3271</p>	<p><u>LEWISTON</u> Central Maine Hearing Ctr (*) 12 High Street, Suite 102 Lewiston, ME 04240 Phone: (207) 786-9949 Fax: (207) 786-9948</p>	<p><u>LEWISTON</u> L/A Hearing Center (*) 72 Strawberry Avenue Lewiston, ME 04240 Phone: (207) 782-2150 Fax: (207) 782-3621</p>	<p><u>NORWAY</u> Maine Medical Partners, ENT 193 Main Street Norway, ME 04268 Phone: (207) 743-2835 Fax: (207) 743-0214</p>
<p><u>PORTLAND</u> InterMed (*) 84 Marginal Way Portland, ME 04103 Phone: (207) 347-2910 Fax: (207) 523-8591</p>	<p><u>PORTLAND</u> Maine Medical Partners, ENT (*) 1250 Forest Avenue Portland, ME 04103 Phone: (207) 797-5753 Fax: (207) 797-9571</p>	<p><u>PORTLAND</u> Mark Hammond Assoc., Inc (*) 222 Auburn Street Portland, ME 04103 Phone: (207) 797-8255 Fax: (207) 797-5560</p>	<p><u>PORTLAND</u> MKM ENT Associates (*) 43 Baxter Blvd. Portland, ME 04101 Phone: (207) 535-1150 Fax: (207) 775-3378</p>	<p><u>PORTLAND</u> Northeast Hearing and Speech (*) 75 West Commercial St, Suite 205 Portland, ME 04101 Phone: (207) 874-1065 Fax: (207) 874-1068</p>
<p><u>PRESQUE ISLE</u> Aural Rehabilitation Services (*) 6 B Martin Street Presque Isle, ME 04769 Phone: (207) 764-8401 Fax: (207) 768-5749</p>	<p><u>PRESQUE ISLE</u> Northern Maine ENT (*) 180 Academy Street, Suite #1 Presque Isle, ME 04769 Phone: (207) 760-8100 Fax: (207) 760-8188</p>	<p><u>ROCKPORT</u> PenBay Speech & Hearing (*) c/o PBMC 6 Glen Cove Drive Rockport, ME 04856 Phone: (207) 230-6380 Fax: (207) 230-6378</p>	<p><u>WATERVILLE</u> Anne Giroux Audiology (*) 124 Silver Street Waterville, ME 04901 Phone: (207) 872-0320</p>	<p><u>WATERVILLE</u> Maine General Medical Center (*) 149 North Street Waterville, ME 04901 Phone: (207) 872-4383 Fax: (207) 872-4222</p>
<p><u>WINDHAM</u> Village Hearing Care, P.A. 584 Roosevelt Trail Suite 9 Windham, ME 04062 Phone: (207) 893-1730 Fax: (866) 596-0877</p>				

Facility information is accurate as of July 2014. Information may change due to changes in staffing and diagnostic capacity. Please notify the Maine CDC Newborn Hearing Program with any corrections and updates. (207) 287-8427