

AUDIOLOGICAL SURVEILLANCE IN CONGENITAL HYPOTHYROIDISM

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Please find following a summary of a literature search and relevant results. All articles can be provided in full - email library@monashhealth.org for a list of the articles you require.

QUESTION

What evidence is there to support auditory surveillance in patients with congenital hypothyroidism?

RESULTS

ONLINE RESOURCES

GUIDELINES

Children's Health Queensland Hospital and Health Service. (2022). **Guidelines for Assessment of Children with Hearing Loss.** [Web link.](#)

- Lists 'Thyroid function' as a 'Teir 2: for specific clinical indications' assessment in cases of congenital hearing loss.

NHS Scotland. (2022). **Management of congenital hypothyroidism.** [Web link.](#)

- 'What to do at each visit' 3.i. recommends considering 'pre-school formal audiology' as part of patients ongoing development assessment.

Safer Care Victoria. (2016). **Hypothyroidism in neonates.** [Web link.](#)

- Hearing tests should be done at four to eight weeks then three-monthly for first year if dyshormonogenesis.

Australasian Paediatric Endocrine Group. (2015). **Guidelines for Management of Congenital Hypothyroidism.** [Web link.](#)

- Recommends hearing tests 'to be organized for all babies with suspected dyshormonogenesis (family history of Pendred syndrome or thyroid scan findings as above)'
- Auditory brain stem responses or otoacoustic emissions' tests is recommended at the age of 4-6 wks
- If dyshormonogenesis is suspected 'hearing tests should be performed regularly for at least the first year of life' - recommended three monthly.

CLINICAL DECISION SUPPORT

UpToDate. (2025). **Congenital hypothyroidism: Treatment and prognosis.** [Web link.](#)

- We recommend routine hearing tests for infants with congenital hypothyroidism; screening for hearing loss at birth is now part of many newborn screening programs, including a majority of American states.
- Repeated screening for hearing loss is also important and especially if learning differences are detected.

Merck (MSD) Manual. (2024). **Hypothyroidism in Infants and Children.** [Web link.](#)

- Advises retesting hearing loss after infancy.

CONFERENCE ABSTRACTS

Smith, A., et al. (2017). **Permanent Childhood Hearing Impairment: Aetiological Evaluation of Infants identified through the Irish Newborn Hearing Screening Programme.** *Irish Medical Journal*, 110(10), 651. [Click for full-text.](#)

The Newborn Hearing Screening Programme (NHSP) was established in Cork University Maternity Hospital (CUMH) in April 2011. Between April 2011 and July 2014, 42 infants were identified with a Permanent Childhood Hearing Impairment (PCHI). Following this diagnosis, infants underwent a paediatric assessment according to recognised guidelines with the intention of identifying the underlying aetiology of the PCHI. The aim of this study was to assess the findings of this aetiological workup via retrospective chart review. PCHI data was obtained from the eSP database. This is a web based information system (eSP) used to track each baby through the screening and referral process. A retrospective chart review of these patients was performed. Sixteen (38%) infants were diagnosed with a bilateral sensorineural hearing loss. Two infants had congenital CMV infection. A Connexin 26 gene mutation was detected in one infant. Two infants were diagnosed with Waardenburg syndrome, One with Pendred syndrome and one with Pfeiffer syndrome. Five babies underwent cochlear implantation. Through adherence to the recommended protocol a possible cause of PCHI may be determined. This study has identified areas of future improvement for this service in Ireland.

Prentice, P., et al. (2011). **Audiology follow-up reveals a high incidence of hearing impairment in patients with congenital hypothyroidism.** *Archives of Disease in Childhood*, 96(SUPPL. 1):A27-A28. [Click for full-text.](#)

Over 80% of congenital hypothyroidism (CH) patients were seen by audiology. 35% had mild-moderate hearing loss (HL), suggesting a high risk of hearing problems, even with early thyroxine replacement. Approximately half had conductive HL. No infant had severe HL. However, these data should be cautiously interpreted in this relatively small cohort. Our preliminary findings underline the importance of audiology follow-up, since initial national newborn hearing screen (NNHS) may not pick up significant HL.

Vadina, T., et al. (2011). **Hearing disorders in children and adolescents with congenital hypothyroidism.** *Hormone Research in Paediatrics*, 76(SUPPL. 2), 257-258. [Click for full-text.](#)

High frequency of hearing disturbances in children with congenital hypothyroidism defines necessity of audiology examination in all children in spite of the absence of complaints.

PEER-REVIEWED JOURNAL ARTICLES – MOST RECENT FIRST

Articles are grouped by theme:

- Neonatal screening programs
- Individual surveillance recommendations

Each article summary contains excerpts from the abstract and an online link.

NEONATAL SCREENING PROGRAMS

Pathak, N., et al. (2023). **"Catch Them Young"-Neonatal Screening For Hearing Loss, A Hospital Based Study.** *JK Science*, 25(3), 144-148. [Click for full-text.](#)

Universal neonatal screening for hearing loss in all new-borns will ensure the inclusion of apparently normal neonates who form a large chunk of the "invisible burden of hearing impairment".

Abitter, Y., et al. (2021). **Our newborn hearing screening results of infants with congenital hypothyroidism.** *Turkish Journal of Pediatric Disease*, 15(3), 203-207. [Click for full-text.](#)

Objective: We aimed to reveal newborn hearing screening test results and risk factors of babies diagnosed with congenital hypothyroidism (CH) in our hospital. Material(s) and Method(s): The files of the newborns who were evaluated within the scope of the national newborn screening program between January and December 2019 were retrospectively reviewed. Risk factors were evaluated by comparing newborn hearing screening test results of babies with CH and euthyroid control groups. Result(s): There was no significant difference between the two groups in terms of demographic and pregnancy datas. There was no significant difference between the CH and control groups in terms of the rate of failed/passed patients from the hearing screening tests. Patients with thyroid hypoplasia at CH group failed at a higher rate from the first hearing screening test. Conclusion(s): In this study, there was no significant difference between CH and control groups in terms of hearing screening results.

Ahmad, R.I., et al. (2020). **Neonatal screening for congenital hypothyroidism at obstetrics and pediatrics hospital in Latakia, Syria.** *Research Journal of Pharmacy and Technology*, 13(6), 2749-2751. [Click for full-text.](#)

The objective of this study is to determine the prevalence of CH among neonates at the obstetrics and pediatrics hospital, Lattakia, Syria by screening all neonates born at this hospital. Out of 1760 neonates, 863 were males and 897 were females. The frequency of CH was 7/1760. The female:

male ratio for CH was 2.5:1. Successful performance of congenital hypothyroidism screening program leads to the prevention of mental complications in affected children

INDIVIDUAL SURVEILLANCE RECOMMENDATIONS

Thakur, P.K., et al. (2022). **Evaluation of Hearing Loss in Congenital Hypothyroid Children at a Tertiary Care Hospital in Central India.** *Indian journal of otolaryngology and head and neck*, 74(Suppl 3):4393-4398. [Click for full-text.](#)

Due to the high prevalence of hearing loss in congenital hypothyroidism and its impact on language and cognitive development, it is critical to create awareness among healthcare professionals that children diagnosed with congenital hypothyroidism must undergo audiological evaluation at the time of diagnosis and periodically thereafter. Alternatively, children with unexplained hearing loss must be screened for congenital hypothyroidism.

Almagor, T., et al. (2021). **High Prevalence of Hearing Impairment in Primary Congenital Hypothyroidism.** *European thyroid journal*, 10(3), 215–221. [Click for full-text.](#)

Our findings indicate a high prevalence of hearing impairment (HI) among patients with congenital hypothyroidism (CH), predominantly of the conductive type. HI was not associated with the etiology of CH or with delayed initiation of LT4 therapy. Audiometry is recommended for children diagnosed with CH and repeat monitoring may be warranted to identify acquired HI and to prevent long-term sequelae of undiagnosed deafness.

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Thomann, J., et al. (2021). **Guideline Adherence and Registry Recruitment of Congenital Primary Hypothyroidism: Data from the German Registry for Congenital Hypothyroidism (HypoDok).** *International journal of neonatal screening*, 7(1), 10. [Click for full-text.](#)

Neonatal screening for congenital primary hypothyroidism (CH) is mandatory in Germany but medical care thereafter remains inconsistent. Therefore, the registry HypoDok of the German Society of Pediatric Endocrinology and Diabetology (DGKED) was analyzed to evaluate the implementation of evidence-based guidelines and to assess the number of included patients. Regular follow-ups were documented. In the first three years of life, less than half of the patients underwent audiometry; developmental assessment was performed in 49.3% (A) and 24.8% (B) ($p < 0.01$). Documentation of CH patient care by pediatric endocrinologists seemed to be established, however, it reflected only a minority of the affected patients. Therefore, comprehensive documentation as an important instrument of quality assurance and evidence-based medicine should be legally enforced and officially funded in order to record, comprehend, and optimize care and outcome in patients with rare diseases such as CH.

Mey, K., et al. (2019). **The Natural History of Hearing Loss in Pendred Syndrome and Non-Syndromic Enlarged Vestibular Aqueduct.** *Otology & neurotology*, 40(3), e178–e185. [Click for full-text.](#)

In patients with PS/NSEVA and SLC26A4 mutations, the average hearing loss progresses to 80 dB HL by the age of 6 years. For biallelic (M2) affected individuals it was 3.2 years. Although hearing levels reached severe to profound during childhood, almost 1/2 had passed neonatal hearing screening, at least monaurally, emphasizing the need for close follow-up.

Andrade, C. L. O., et al. (2017). **Mechanisms involved in hearing disorders of thyroid ontogeny: a literature review.** *Archives of endocrinology and metabolism*, 61(5), 501–505. [Click for full-text.](#)

Congenital hypothyroidism may have clinical and subclinical manifestations that affect the auditory system and may be a potential risk factor for hearing impairment. Hearing impairment can severely impact quality-of-life, which emphasizes the importance of monitoring and evaluating hearing during the clinical routine of these patients.

Karakus, C.F., et al. (2015). **Is sensorineural hearing loss related with thyroid metabolism disorders?** *Indian Journal of Otolaryngology*, 21(2), 138-143. [Click for full-text.](#)

The results of this study showed that both hyperthyroidism and hypothyroidism may have an effect on hearing pathway disorders. Medical therapy may lead to hearing loss in patients with hyperthyroidism, and the underlying factors should be investigated in detailed future studies. It was shown in our study that the hearing loss induced by hypothyroidism may improve with medical therapy. Therefore, in all patients with thyroid dysfunction, hearing levels should be monitored closely with audiometric tests.

APPENDIX

SEARCH METHODOLOGY

A systematic search was conducted for literature. The results were screened by librarians using [Covidence](#).

SEARCH LIMITS

- English-language
- Published within the last 15 years

DATABASES SEARCHED

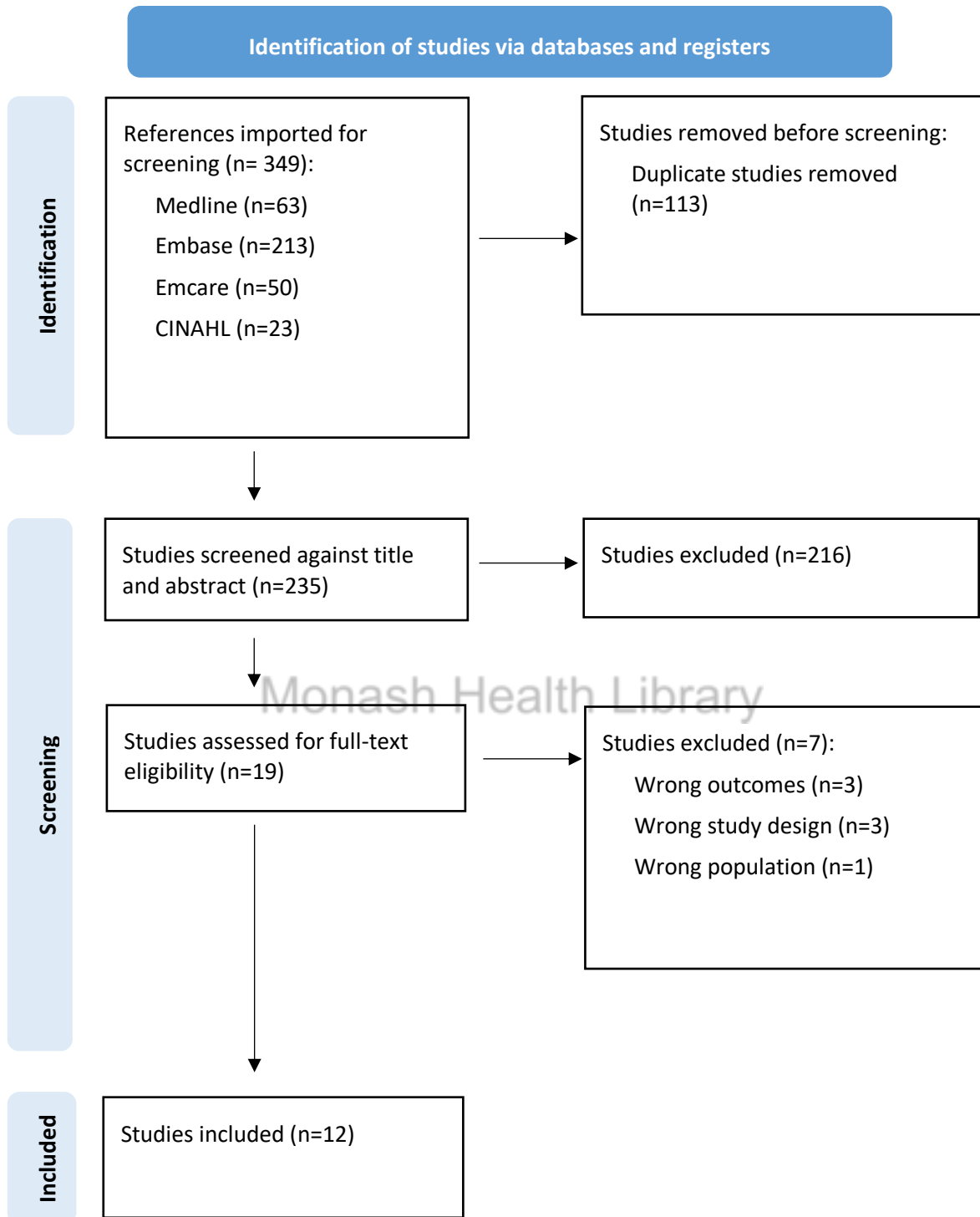
- Medline – index of peer reviewed articles across health sciences and medicine.
- Embase – index of biomed and pharmacological peer reviewed journal articles.
- Emcare – index of nursing, allied health, critical-care medicine and more.
- CINAHL – index of nursing publications.
- UpToDate & BMJ Best Practice – synthesised evidence for patient care.
- Grey literature – Google, Google Scholar, Trip database, Biomed Central Proceedings.

MEDLINE SEARCH STRATEGY

This search strategy was conducted on 19/01/2026 and translated to other databases, as relevant. Searches in each database were conducted on the same day.

- 1 (congenital hypothyroid* or dyshormonogenesis or pendred syndrome).tw,kf.
- 2 ((thyroid* or hypothyroid*) adj2 (defect* or disorder* or dysgenesis or underdevelop* or deficient* or underactive or absent or deform* or malform*)).tw,kf.
- 3 Congenital Hypothyroidism/ or Thyroid Dysgenesis/
- 4 1 or 2 or 3
- 5 ((hear* or audio* or auditory or deaf* or listen*) adj3 (screen* or test* or assess* or surveill* or monitor* or follow-up* or follow up*)).tw,kf.
- 6 exp hearing tests/
- 7 5 or 6
- 8 4 and 7
- 9 limit 8 to (english language and last 15 years)

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