*i*CAHE JC Critical Appraisal Summary

Journal Club Details

Journal Club location   **Women's & Children's**

JC Facilitator   **Lisa Callahan**

JC Discipline   **Audiology**

Question

NA

Review Question/PICO/PACO

P: N/A

I: N/A

C: N/A

O: N/A

Article/Paper

Stevens J, Boul A, Lear S, Parker G, Ashall-Kelly K, Gratton D. Predictive value of hearing assessment by the auditory brainstem response following universal newborn hearing screening. International journal of audiology. 2013 Jul 1;52(7):500-6.

Please note: due to copyright regulations CAHE is unable to supply a copy of the critically appraised paper/article. If you are an employee of the South Australian government you can obtain a copy of articles from the DOHSA librarian.

Article Methodology: Cohort Study

The International Centre for Allied Health Evidence (*i*CAHE)
For more information on CAHE Journal Clubs email iCAHEjournalclub@unisa.edu.au
To receive CAHE updates register online at www.unisa.edu.au/cahe

Ques No.	Yes	Can't Tell	No	Comments
1	✓			**Did the study address a clearly focused issue?** The purpose of this study was to try to provide more data on this for tone pip ABR and in particular determine its predictive accuracy within the context of referral from a universal newborn hearing screen. This study set out to determine the accuracy with which tone pip ABR and click ABR, carried out in babies referred from universal newborn hearing screening, is able to predict the hearing outcome as determined by follow-up hearing tests.
2	✓			**Did the authors use an appropriate method to answer their question?** A cohort study is appropriate for this question, as they are looking at following a specific group of individuals over time to track whether or not a condition occurs. **Is it worth continuing?** YES
3	✓			**Was the cohort recruited in an acceptable way?** All babies (N = 94) born between January 2002 and September 2007 referred from the Sheffield, UK universal newborn hearing screen who, following assessment, were considered to have significant hearing impairment in at least one ear were included in the study.
4	✓			**Was the exposure accurately measured to minimize bias?** The criteria for significant hearing impairment for most of the study, was an ear that did not have a clear click ABR response at 45 dBnHL or below. This was reduced to 35 dBnHL or below in the latter stages of the study intake. BC ABR was carried out where appropriate. TDH39 earphones were used for all ABR tests calibrated in dBnHL with reference to values used in the English newborn hearing screening program for 2002 to 2007. The RETSPL for clicks was 33 dB SPL ppe and that for tone pips was 1-kHz 21 dB SPL ppe and 4-kHz 29 dB SPL ppe. It is considered that the enclosed volume of a TDH39 earphone placed on a baby's ear is little different to that of an adult and so the stimulus level will be similar to that delivered to an adult ear. This is in contrast to the use of an insert earphone where the much smaller ear canal volume of a baby may raise the stimulus level in the ear canal considerably, e.g. a mean difference of 20 dB for clicks compared to adults (Sininger et al, 1997). Stimuli were 2:1:2 tone pips or 100-µS clicks. Recordings were made between a high forehead and ipsilateral mastoid electrode pair with fi lters at 0.03 and 1.5 kHz. Thresholds were taken as the lowest clear response (as defined in the English newborn hearing screening program guidance for ABR testing in babies, 2010). Where there was no recordable ABR at the highest stimulus level used in good recording conditions and the stimulus level was ≥80 dBnHL, 10 dB was added to the highest stimulus level as an estimate of threshold. If the highest stimulus level was <80 dBnHL, the result was not used. Where the ABR had been recorded down to a low level (≤45 dBnHL for clicks and ≤50 dBnHL for tone pips), but threshold had not been determined, 10 dB was subtracted from the lowest level recorded to give an estimate of threshold.
5	✓			**Was the outcome accurately measured to minimize bias?** Follow-up assessment: Two thirds of the tests were PTA or play audiometry, and one third insert VRA (English Newborn Hearing Screening Program 2008, visual reinforcement audiometry testing of infants, a recommended test protocol). Thresholds were measured in dBHL with test equipment being calibrated to international standards (ISO 389). Follow-up average hearing thresholds were only calculated where all four frequencies (0.5, 1, 2, and 4 kHz) had been measured

The International Centre for Allied Health Evidence (*i*CAHE)
For more information on CAHE Journal Clubs email iCAHEjournalclub@unisa.edu.au
To receive CAHE updates register online at www.unisa.edu.au/cahe

#				
6			✓	**Have the authors identified all important confounding factors?** Possible confounding factors include late onset hearing loss, progressive hearing loss, and changes to any conductive element. **Have they taken account of the confounding factors in the design and/or analysis?** While these confounders were identified in the discussion, they were not accounted for in the analysis or design.
7	✓			**Was the follow up of subjects complete enough?** The mean age for the follow up test results used was 3.86 years, with a SD of 1.55 years.
8				**What are the results of this study?** The standard deviation of the difference between the follow up and the tone pip ABR thresholds was 10.5 dB for the 4-kHz tone pip, 16.8 dB for the 1-kHz tone pip, and ranged between 21.7 and 24.7 dB for click ABR. The results of the study show that tone pip ABR following referral from newborn hearing screening has a similar accuracy to that reported in older subjects, and is a much better predictor compared to click ABR.
9				**How precise are the results?** Only correlations were calculated for this study, and confidence intervals and P-values were not utilized. Correlations which were utilized were appropriate for study methodology.
10	Journal Club to discuss			**Do you believe the results?**
11				**Can the results be applied to the local population?** **CONTEXT ASSESSMENT (please refer to attached document)** – *Infrastructure* – *Available workforce (? Need for substitute workforce?)* – *Patient characteristics* – *Training and upskilling, accreditation, recognition* – *Ready access to information sources* – *Legislative, financial & systems support* – *Health service system, referral processes and decision-makers* – *Communication* – *Best ways of presenting information to different end-users* – *Availability of relevant equipment* – *Cultural acceptability of recommendations* – *Others*
12				**Were all important outcomes considered?**
13				**Are the benefits worth the harms and costs?**
14				**What do the study findings mean to practice (i.e. clinical practice, systems or processes)?**

The International Centre for Allied Health Evidence (*i*CAHE)
For more information on CAHE Journal Clubs email iCAHEjournalclub@unisa.edu.au
To receive CAHE updates register online at www.unisa.edu.au/cahe

15		**What are your next steps?** *ADOPT, CONTEXTUALISE, ADAPT* **And then (e.g. evaluate clinical practice against evidence-based recommendations; organise the next four journal club meetings around this topic to build the evidence base; organize training for staff, etc.)**
16		**What is required to implement these next steps?**