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Patent and Trademark Office

COVER SHEET

To the Honorable Commis ... and the attached original documents or copy thereof.

1. Name of conveying party(ies):

Desert Heat

___ Individual(s) ___ Association
___ General Partnership ___ Limited Partnership
x Corporation-State Arizona
___ Other _____

Additional name(s) of conveying party(ies) attached
____Yes __x__ No

2. Name and address of receiving party(ies):

Name: Hartwell Industries, Inc.
Internal Address: _____
Street Address: 97 Winfield Circle
City: Hartwell State: GA Zip: 30643

___Individual(s) citizenship _____
___Association _____
___General Partnership _____
___Limited Partnership _____
x Corporation-State Florida
___Other _____

If assignee is not domiciled in the United States, domestic representative designation is attached:
_____Yes ____x__No
(Designations must be a separate document from Assignment)
Additional name(s) & addresses attached?
_____Yes ____x___No

3. Nature of conveyance:

x Assignment ___ Merger
___ Security Agreement ___ Change of Name
___ Other _____

Execution Date: June 17, 1998

4. Application number(s) or registration number(s):

A. Trademark Application No.(s)

B. Trademark Registration No.(s).
1,980,674

Additional Numbers attached? _____ Yes ___x___ No

5. Name and address of party to whom correspondence concerning document should be mailed:

Name: Lawrence E. Apolzon
Internal Address: Fross Zelnick Lehrman & Zissu, P.C.

Street Address: 633 Third Ave.
City: New York State: NY Zip: 10017

6. Total number of applications and registrations involved: 1

7. Total fee (37 CFR 3.41) ..... $ 40.00

X Enclosed
X Authorized to be charged to deposit account
(Only if total fee is not sufficient)

8. Deposit account number: 23-0825-0576900

(Attach duplicate copy of this page if paying by deposit account)

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9. Statement and signature.

To the best of my knowledge and belief, the foregoing information is true and correct and any attached copy is a true copy of the original document.

Lawrence E. Apolzon — Name of Person Signing
Signature
9/24/98 — Date

Total number of pages comprising cover sheet:: _____

OMB No. 0651-0011 (exp. 4/94)

FZLZ File No.: HWL USA TT-98/04433

ASSIGNMENT

WHEREAS, DESERT HEAT, a corporation organized and existing under the laws of the State of Arizona (**"Assignor"**), with an address at 7640 E. Gelding Dr., Suite A, Scottsdale, Arizona 85253, is the owner of the following trademark now registered in the United States Patent and Trademark Office:

Trademark	Reg. No.
DESERT HEAT & Design	1,980,674

and WHEREAS, HARTWELL INDUSTRIES, INC., a corporation organized and existing under the laws of the State of Florida, located at 97 Winfield Circle, Hartwell, Georgia 30643 (**"Assignee"**), is desirous of acquiring said registered trademark.

NOW, THEREFORE, for good and valuable consideration, receipt of which is hereby acknowledged, Assignor hereby assigns to Assignee all right, title and interest in and to said trademark, together with the goodwill of the business symbolized by said trademark and the above-named registration therefor, and with all claims arising out of or relating to the use or ownership of said mark.

DESERT HEAT

By: _____

Name: R. Stephen Leffler

Title: CEO

Date of Signature: 6-17-98

15-05a I:\HOME\PBOISSON\DOCS\HWL1ASS

pursuant to section 2(e)(1) of the Trademark Act, 15 U.S.C. §1052(e)(1), based on the preliminary assessment that the mark is merely descriptive of Natus' goods. Natus requests reconsideration of the section 2(e)(1) refusal in light of the arguments and information set forth below and in the Declaration of Tim C. Johnson, President of Natus Medical, Inc., dated September 18, 1998 ("Johnson Decl."), submitted herewith.

The Examiner's conclusion of descriptiveness is based primarily on three article excerpts found through a computer search which, the Examiner contends, use the mark AABR descriptively. An examination of these articles, however, reveals that each, in fact, references Natus' goods specifically. In his Declaration, Mr. Johnson addresses each of these articles individually and concludes that none actually uses the mark AABR descriptively, rather, each time the mark is used, it references Natus. See Johnson Decl. ¶¶ 3-5.

To confirm that all current references to AABR in fact also reference Natus, an additional search for "AABR" was performed first in the GENMED library and RXMEGA file on LEXIS-NEXIS. The search revealed the three excerpts attached to the Office Action letter and one additional excerpt, which uses "AABR" as a self-defined term in the article to refer to "acoustically-evoked auditory brain-stem response" and to distinguish it from "EABR" (electrically-evoked auditory brain stem response), another defined term in the article. See Johnson Decl. ¶ 6.

In addition, a search for "AABR" was performed in the NEWS library, ALLNWS file. This search produced 19 articles. Many of these articles, however, do not address the topic of hearing screening, but instead use AABR as an abbreviation for other unrelated organizations, such as the Asian American Business Roundtable and the Association for the Advancement of the Blind and Retarded, Inc. See Johnson Decl. ¶ 7, Exhs. D-P. The remaining articles which

mention AABR in the context of infant hearing screening each refer to Natus. See Johnson Decl. ¶¶ 8-14. For example, article 3 of 19 discusses a new medical program selected by a Belgium government agency to integrate infant hearing screening into the family healthcare program. See Johnson Decl. ¶¶ 8, Exh. Q. The article mentions the selection of Natus' AABR product, specifically noting that it is unique to Natus. Similarly, other articles produced by the NEWS search describe programs in various states, such as Wyoming, Rhode Island, Virginia and New Mexico, for which Natus' AABR product has been chosen and is used exclusively for hearing screening. See Johnson Decl. ¶¶ 10, 11, 12, 13.

As Mr. Johnson notes in his Declaration, none of the articles found describe a product other than that of Natus. Johnson Decl. ¶ 5, 6, 14. The absence of the use of the mark by competitors or in reference to a competitor's product suggests that the mark is neither a generally recognized term for automated hearing screening nor merely descriptive of such automated screeners. See The Firestone Tire & Rubber Co. v. The Goodyear Tire & Rubber Co., 186 U.S.P.Q. 557, 559 (T.T.A.B. 1975) (lack of use by competitors suggests that use of term to describe product is neither natural or obvious; mark held not merely descriptive where no use by competitors shown). See also In re Dollar Rent-a-Car Systems, Inc., 173 U.S.P.Q. 435, 437 (T.T.A.B. 1972) (finding "DOLLAR A DAY" distinctive, noting "if the term is as highly descriptive as asserted by the examiner, one would suppose that there would be at least one descriptive use thereof by a competitor but none has been shown").

In addition, AABR is not a term the monopolization of which will cause competitors to be unable to describe their products. See Application of Reynolds Metals Co., 480 F.2d 902, 904 (C.C.P.A. 1973) (registration of "BROWN IN BAG" will not deprive competitors of common generic words; competitors are deprived only of the use of such words in

a format likely to cause confusion); Firestone Tire & Rubber Co., 173 U.S.P.Q. at 558 (registration of "BIASTEEL" does not prevent competitors from using "bias" and "steel" in a proper descriptive manner).

Given the lack of evidence demonstrating that the mark AABR is merely descriptive of hearing screening devices, Natus respectfully requests that its mark proceed to publication.

IDENTIFICATION OF GOODS

Natus requests amendment of the identification of goods to a slight variation of that suggested by the Examiner for International Class 10: "Medical hearing screener device for testing hearing."

FUTURE CORRESPONDENCE

Please direct all future correspondence concerning this application to Peter Bucci at Orrick, Herrington & Sutcliffe LLP, 666 Fifth Avenue, New York, New York 10103.

Dated: September 21, 1998

Respectfully submitted,

Peter Bucci
ORRICK, HERRINGTON &
SUTCLIFFE, LLP
666 Fifth Avenue
New York, New York, 10103
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Attorneys for Applicant Natus Medical, Inc.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant	:	Natus Medical, Inc.
Serial No.	:	75/338,140
Filed	:	August 8, 1997
Mark	:	AABR
International Class	:	10
Examiner	:	Karen Kuhlke Law Office 105
Mailing Date of Office Action	:	March 20, 1998

DECLARATION OF TIM C. JOHNSON

I, TIM C. JOHNSON, declare that:

1. I am the President of Natus Medical, Inc. ("Natus") and, in that capacity, I executed the application of Natus to register the mark AABR on the Principal Register. I submit this Declaration in response to Office Action No. 1, dated March 20, 1998, in which the Examiner refused registration of the mark on the grounds that it describes Natus' product. Except as otherwise noted, I have personal knowledge of the facts set forth herein.

EXPRESS MAIL LABEL No. EL030182514US

Date of Deposit: September 21, 1998

I hereby certify that this paper or fee is being deposited with the United States Postal Service "Express Mail Post Office to Addressee" service under 37 CFR § 1.10 on the date indicated above and is addressed to:

Assistant Commissioner for Trademarks, 2900 Crystal Drive, Arlington, VA 22202-3513

Lisa T. Simpson

(Name of person mailing paper or fee)

2. In preparation of this Declaration, I reviewed the Office Action letter and the articles attached thereto and additional articles provided to me by counsel which, as I understand, were the result of various computer searches for the mark AABR. The following paragraphs detail my understanding of the nature of the reference to AABR contained in those articles.

3. The article attached hereto as Exhibit A is a full-text copy of the first article cited by the Examiner, "Universal Infant Hearing Screening by Automated Auditory Brainstem Response Measurements." The reference to AABR in this article is unquestionably a reference to Natus and its products. Page 3 of the printout clearly states that the equipment used to conduct the AABR hearing screening study detailed by the article was Natus' ALGO-1 Plus.

4. Attached as Exhibit B is a full-text copy of the article referenced in both the second and third excerpts attached to the Office Action letter (both the EMBASE and MEDLINE excerpts), "Neonatal Hearing Screening with an Automated Auditory Brainstem Response Screener in the Infant's Home," Acta Paediatrica 86:651-5 (1997). Although the excerpts cited by the Examiner do not mention Natus, the full-text version of the article notes specifically on the first page that the screening detailed in the article was conducted with Natus' AABR method and ALGO-1 PLUS screener.

5. The articles cited by the Examiner, therefore, contain no reference to AABR that is not also a reference to Natus.

6. Attached as Exhibit C is an additional article which appears to have been found in the EMBASE database, "Refractory Properties of Auditory Brain Stem Responses Evoked by Electrical Stimulation of Human Cochlear Nucleus." This article, which discusses a study of electrical stimulation of the brain stem, mentions a comparison of that electrical

stimulation with acoustically-evoked auditory brain-stem response. The author appears to use the abbreviation AABR simply as a defined term within the article to reference "acoustically-evoked auditory brain-stem response" and to distinguish it from "EABR" (electrically-evoked auditory brain stem response).

7. Nineteen articles were provided to me by counsel which I am informed were produced by a search in the news database of LEXIS-NEXIS. My review of these articles leads me to conclude that the articles numbered 1, 2, 5, 7, 8, 10, 12, 14, 15, 16, 17, 18 and 19 have nothing to do with hearing screening or the mark AABR in the context of hearing screening. These articles are attached hereto as Exhibits D-P.

8. Attached as Exhibit Q is an article (numbered 3 of 19) entitled "Belgian Med Program Integrates Newborn Hearing Screening." This article specifically mentions Natus and its AABR product and specifically recognizes that Natus is using AABR exclusively.

9. The article attached as Exhibit R (numbered 4 of 19) duplicates the story told in the article numbered 3 or 19 and discussed in paragraph 8 above. Consequently, the reference to AABR is also to Natus.

10. The article attached as Exhibit S (and numbered 6 of 19), entitled "Wyoming Leads in Newborn Screening," describes the state of Wyoming's infant hearing screening program, calling the process AABR screening. Although the article does not mention Natus specifically, I am aware that the state of Wyoming screens its infants with Natus AABR and its ALGO product. No other similar screening product is used by the State.

11. The article attached as Exhibit T (and numbered 9 of 19), "Women & Infants Hospital in Rhode Island Adds ALGO Newborn Hearing Screener To Program with

Outstanding Results," clearly references Natus' ALGO equipment and the AABR method as Natus' technology.

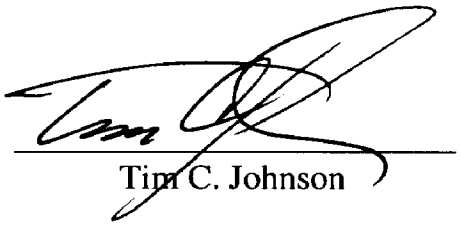
12. Attached as Exhibit U is a full text copy of the article numbered 11 of 19, entitled "EVMS Researchers Seek Mandatory Hearing Tests for All Va. Newborns; New Technology Makes Accurate Screening Affordable." While this article does not specifically mention Natus in its discussion of AABR, it nonetheless is detailing Natus' AABR process. It describes the procedure as follows, "with the new procedure, sensors measure a baby's brain-wave responses to a series of clicks, delivered through cushioned earphones." This is Natus' AABR method. Given this detailed description of Natus' AABR, I can conclude that this article too references Natus and its AABR method.

13. The final article found in the computer search which mentions AABR (numbered 13 of 19) contains a reference to Natus and its ALGO product in the title of the article itself, "New Mexico adopts Natus Medical's ALGO 2; Statewide Infant Hearing Program Well Underway." See Exhibit V hereto.

14. It is my understanding that I have now considered all of the articles produced when AABR is searched in the news database of LEXIS-NEXIS. Each and every one of these articles is about Natus and its screening products. No other company is referenced or named as using the AABR mark, nor does the mark AABR appear simply as generally accepted terminology for the technology of automated hearing screening. Rather, every time it is mentioned, it is mentioned in the context of Natus.

I declare under penalty of perjury under the laws of the United States of America that the foregoing is true and correct.

Dated: September 18, 1998



Tim C. Johnson

LEVEL 1 - GROUP 1 - 1 OF 1 Med & Health Jnl

Pediatrics 1998; 101: 221-228

February, 1998

SECTION: ARTICLES

LENGTH: 5278 words

TITLE: Universal Infant Hearing Screening by Automated Auditory Brainstem Response Measurement

AUTHOR: Judith A. Mason, MS <1>, and Kenneth R. Herrmann, MD <2>

ABSTRACT: Background. Our purpose was to identify infants with a bilateral, permanent, handicapping hearing loss and to provide them with amplification before age 6 months.

Methodology. The study population consisted of 10 372 infants born during a 5-year period. Universal hearing screening by automated auditory brainstem response was done in the nursery. Infants who failed the screening test were followed up diagnostically. Infants who were not tested in the nursery were followed up as outpatients. Hearing aids were recommended for those infants who had bilateral hearing loss.

Results. Successful screening in the nursery was achieved for 96% of infants. The failure rate was 4%. The incidence of bilateral loss requiring amplification was 1.4/1000. The false-positive rate was 3.5% after the initial screening and .2% when a two-stage screening procedure was used. The incidence of congenital bilateral hearing loss in the well population was 1/1000, and in the neonatal intensive care unit population, 5/1000. The cost of screening was $ 17 per infant, and the cost to identify each true bilateral hearing loss was $ 17 750. Amplification was recommended for 15 infants; well infants who used hearing aids before age 6 months achieved age-appropriate speech and language development.

Conclusions. Mild, moderate, and severe bilateral, persistent hearing loss can be identified in the nursery by automated auditory brainstem response measurement to provide amplification before age 6 months and thus optimize speech and language development.

[Pediatrics 1998;101:221-228; infant hearing screening, newborn hearing screening, neonatal hearing screening, universal newborn hearing screening, automated auditory brainstem response, bilateral hearing loss, congenital hearing loss.]

TEXT:

ABBREVIATIONS. AABR, automated auditory brainstem response; NICU, neonatal intensive care unit; ABR, auditory brainstem response; OAE, otoacoustic emissions.

The Kaiser Permanente Medical Center in Honolulu, Hawaii, established a universal newborn hearing screening program in 1992 in response to state and national legislation. We chose automated auditory brainstem response (AABR) measurement performed in the nursery before discharge to optimize the identification of hearing-impaired infants. We report our 5-year experience in screening 10 372 newborn infants using AABR.

MATERIALS AND METHODS

Study Group

Well infants, hospitalized from 24 to 36 hours, were screened at age 3 to 36 hours; neonatal intensive care unit (NICU) infants were screened before discharge (at age 2 days to 90 days or more). Specific statistics on the age of each infant at screening were not kept. All the NICU infants had risk factors [n1,n2] for hearing loss; risk factors occurred in <2% of the well-infant population and included cleft palate, exposure to antibiotics, skin tags near the ears, and a family history of hearing loss.

The races of the population sampled included white, Asian, Pacific Islander, and mixed. Compared with the racial composition of the United States as a whole, Hispanic and black representation was minimal.

Less than 1% of our total population represented deaths or transfers to and from other facilities. The NICU is a level 2 facility, providing all services except cardiac surgery and extracorporeal membrane oxygenation.

Equipment

The ALGO-1 Plus [n3] (Natus Medical Inc, San Carlos, CA) was used for all screenings. This automated hearing screener uses auditory brainstem response (ABR) measurement with a broadband click stimulus [technical specifications for the click stimulus: duration = 100 microseconds; intensity = 35 dB nHL; polarity = alternating; acoustic frequency spectrum = 700 to 5000 Hz (+/-5 dB); filter settings: 0.05 to 1.5 kHz, 6 dB high pass, 24 dB low pass] which tests at frequencies greater than 1000 Hz. [n3] Built-in artifact rejection for myogenic, electrical, and environmental noise interference ensures that data collection is halted if testing conditions are unfavorable. The automated screener provides a pass-fail report; no test interpretation by an audiologist is required.

Screening in the Nursery

Infants born at Kaiser Permanente Medical Center, Honolulu, Hawaii, from March 1992 and through February 1997 were screened before discharge as part of an ongoing universal new-born hearing screening program. Screening was done 7 days per week, 365 days per year, by audiologists during the first 2 years of the program and subsequently by technicians. Successful screening requires infant comfort, a relatively quiet environment, proper application (electrode impedance <12 K ohms<3>) of surface electrodes in a noncephalic montage [n4] (electrode montage: noninverting = high forehead, inverting = nape, and common = mastoid), application of adhesive circumaural headphones, and presentation of the click stimulus. Well-infant screenings were performed at the mother's bedside with the infant resting in the mother's arms or in a quiet room

adjoining the nursery with the infant in an open bassinet. NICU infants were screened in the nursery. Examinations took a mean 15 minutes (range, 1 to 60 minutes), depending on the infant's state and the infant's hearing status. Outpatient screening was conducted for infants who failed nursery screening and for those who were not screened in the nursery. Diagnostic ABR was done before age 1 month.

Diagnostic Follow-up Testing and Intervention

Infants referred for outpatient evaluation were tested by using diagnostic ABR (Compact Auditory 4; Nicolet Biomedical Inc, Madison, WI). Normal findings were defined as click thresholds of </=35 dBnHL. [n5] Diagnostic testing also included high-frequency tympanometry and ipsilateral acoustic reflex testing (GSI-33; Lucas Grason-Stadler, Inc, Littleton, MA), behavioral observation audiometry using low-frequency stimuli and running speech (GSI-10, Lucas Grason-Stadler), and an evaluation by an otolaryngologist. Referrals were made outside our facility for distortion product otoacoustic emissions testing. Infants were discharged from the screening program if bilateral hearing loss was ruled out. Test results were communicated to the families and their primary care physicians.

Hearing aids and referrals to infant speech and language habilitation programs were provided when indicated. Well infants received aural habilitation therapy through private agencies. This therapy consisted of private one-to-one sessions conducted 2 to 3 times per week during the first 6 months and a home intervention curriculum provided at no charge via mail-order through a charitable private national agency. NICU infants received therapy as their health permitted.

Speech and language development was tested outside our facility, and information on test scores was retrieved from infants' medical records.

RESULTS

Of the 10 773 infants born during the 5-year study period, 10 372 (96.3%) were screened before discharge from the hospital (Table 1); 401 infants were not screened successfully in the nursery.

TABLE 1. Newborn Infants Tested by Automated Auditory Brainstem Response (AABR) Measurement Screening Program

	n	%
Screened before discharge	10 372	96.3
Screened after discharge	212	2.0
Not screened n1	189	1.7
Total births n2	10 773	100

n1 101 = moved, 80 = noncompliant, 8 = parents refused, 1 = not screened because of continuing hospitalization (not included in this calculation). Infants who died are not included in our study population.

n2 Total ear-specific data on this group was not kept. If an infant passed the initial screen in one or both ears, she or he was discharged and a note was

made in the chart if one ear failed, but these infants were not tracked. During the first 3 years of the program, infants recalled were tested behaviorally at age 6 to 7 months; sound field visual response audiometry was done and ear-specific data was not available. By year 4, we screened all recalled infants by AABR.

Infants Screened in the Nursery

Of the 10 372 infants screened in the nursery, 9957 passed screening, and 415 failed. Fifteen (3.6%) of the infants who failed had permanent bilateral loss >35 dB, a rate of .9/1000 of the study population (Table 2). The remaining 400 infants are described in Table 3.

TABLE 2. Bilateral AABR Failures in Newborn Infants Screened Before Hospital Discharge

Population	n	Loss at Nursery Screening	Confirmed Loss
Well infants	8971	347	8
NICU infants	1401		
68	7		
Total	10 372	415	15

TABLE 3. Evaluation of Infants Labeled False Positive After Initial Screening in the Nursery

Result	n	% of Total Failed
Normal diagnostic ABR or AABR rescreening	219	52.8
Unilateral loss	115	27.8
Bilateral transient or fluctuating loss n1	26	6.2
Lost to follow-up	38	9.1
Testing incomplete	2	.5
Total	400	96.4

n1 Transient loss indicates a loss which resolves slowly over 2 to 12 months; fluctuating loss, a loss caused by recurrent middle ear problems, under treatment by an otolaryngologist.

The 15 infants identified as having bilateral hearing impairment had losses ranging from mild to profound (Table 4). At initial diagnostic testing, all the infants had moderate or greater ABR thresholds; their audiometric test results shifted as they grew older, and 3 were later found to have mild to moderate hearing impairment. Eleven of the hearing losses were sensorineural, 2 were mixed with a substantial sensorineural component, and 2 were permanent conductive (1 with craniofacial anomalies, 1 with bilateral atresia). Seven well infants and 6 NICU infants received hearing aids.

TABLE 4. Infants With Bilateral Hearing Loss

Type and Degree of Loss n1 (Arranged by Severity)	Age of ID	Age of AH
Well infants:		
Mild sensorineural	6 wk	Refused
Mild/moderate sensorineural	4 wk	10 wk
Mild/moderate sensorineural	7 wk	12 wk
Moderate sensorineural rt; mild/moderate sensorineural lt	4 wk	2 y, 5 mo
Moderate sensorineural	7 wk	6 mo
Moderate sensorineural	4 wk	12 wk
Moderate/severe mixed	3 wk	8 wk
Moderate/severe sensorineural	2 wk	14 wk
NICU infants:		
Moderate/severe conductive	4 wk	4 mo
Moderate/severe conductive	2 wk	8 wk
Severe sensorineural	5 wk	10 mo
Severe sensorineural rt; profound sensorineural lt	4 mo	9 mo
Moderate/severe sensorineural rt; severe/profound sensorineural lt	5 mo	10 mo
Profound sensorineural	3 mo	none
Profound sensorineural	5 mo	1 y, 2 mo

Abbreviations: ID, identification; AH, amplification and habilitation; Sp-lang, speech and language; dev, development; AA, age appropriate; rt, right; lt, left; ND, neurologically devastated; PR, parent report; Denver II, Denver Developmental Screening Test II [n73]; PLS-3, Preschool Language Scale 3 [n74]; REEL, Receptive-expressive Emergent Language Scale [n75]; PPVT, Peabody Picture Vocabulary Test [n76]; NT, not tested; SHLDS, SKI*HI Language Development Scale [n77]; HELP, Hawaii Early Language Profile; CII, Communicative Intention Inventory. [n78]

Type and Degree of Loss n1 (Arranged by Severity)	Sp-lang dev/ Age of Testing	Sp-lang Test
Well infants:		
Mild sensorineural	AA/3 y	PR, Denver II
Mild/moderate sensorineural	AA/2 y, 10 mo	PLS-3
Mild/moderate sensorineural	>AA/2y, 5 mo	REEL, PPVT
Moderate sensorineural rt; mild/moderate sensorineural lt	12-mo delay/2 y, 9 mo	REEL
Moderate sensorineural	AA/10 mo	SHLDS
Moderate sensorineural	>AA/1 y, 8 mo	SHLDS
Moderate/severe mixed	9 mo delay n2/2 y, 9 mo	REEL-2
Moderate/severe sensorineural	AA/3 y	REEL
NICU infants:		
Moderate/severe conductive	15 mo delay/31 mo	HELP
Moderate/severe conductive	too young	NT

Severe sensorineural	1 y delay/2 y	REEL-2
Severe sensorineural rt; profound sensorineural lt	6 mo delay/1 y	CII, HELP
Moderate/severe sensorineural rt; severe/profound sensorineural lt	ND	NT
Profound sensorineural	ND	NT
Profound sensorineural	deceased	NT

Abbreviations: ID, identification; AH, amplification and habilitation; Sp-lang, speech and language; dev, development; AA, age appropriate; rt, right; lt, left; ND, neurologically devastated; PR, parent report; Denver II, Denver Developmental Screening Test II [n73]; PLS-3, Preschool Language Scale 3 [n74]; REEL, Receptive-expressive Emergent Language Scale [n75]; PPVT, Peabody Picture Vocabulary Test [n76]; NT, not tested; SHLDS, SKI*HI Language Development Scale [n77]; HELP, Hawaii Early Language Profile; CII, Communicative Intention Inventory. [n78]

n1 Losses are symmetrical except as noted.

n2 Poor hearing aid compliance.

Infants Not Screened in the Nursery

We discharged 401 infants without successful screening; 250 screening examinations were unsuccessful because of myogenic interference, 143 infants were discharged before testing, and 8 parents refused screening. Attempts were made to recall all of these infants for outpatient screening. Only one half (n = 212) returned; the remaining infants' families moved (n = 101) or had parents who declined testing (n = 88). Of the 212 who returned, most (n = 200) had normal results of screening examinations. Abnormal results were found in 12 infants; 11 of these infants had transient losses or are still under evaluation. One infant had bilateral loss and received hearing aids.

DISCUSSION

Development of Newborn Hearing Screening Programs

Hearing loss in infants is a handicap which, if left unidentified and untreated, results in delayed speech and language development as well as emotional, social, and academic difficulty. Normal speech and language development depend on normal hearing, and even mild, persistent loss may result in delays. [n6-n16] The average age of identification of hearing loss in the United States is 20 to 24 months, [n15,n17] and mild and moderate losses are usually not identified until >/=48 months. [n18] Thus, intervention, which should ideally begin by age 6 months, [n19] has often been delayed.

Funding of early intervention programs for handicapped infants and toddlers was enacted in 1986 by the United States Congress. Public Law 99-457 re-authorized Public Law 94-142, The Education of the Handicapped Act, which included a provision for early intervention programs for handicapped persons from birth to age 3 years. [n20,n21] In July 1990, the Hawaii State Legislature

mandated development of a statewide program for early identification of hearing-impaired infants. [n22] In 1993, the National Institutes of Health recommended that all infants receive hearing screening within the first 3 months of life. [n23]

Past efforts to evaluate newborn hearing have included various screening tools. The high-risk register [n24-n26] reviewed birth certificates and hospital records to identify infants at risk for hearing loss. Parental noncompliance was a major problem with this method. [n27,n28] Another screening tool monitored movement associated with a stimulus sound. [n29] This method proved unsatisfactory because false-positive rates ranged from 14% [n30] to 20%. [n29] Modifying the motion detection method by adding behavioral testing improved the sensitivity and specificity. However, precise identification of hearing loss remained elusive because these screening methods omitted the well-infant population, [n31-n34] which accounts for one-half of all individuals afflicted with congenital hearing loss. [n35]

More recently, two methods have been investigated for hearing screening: otoacoustic emissions (OAE) and ABR. Electrophysiologic measurement of responses to auditory stimuli eliminates the ambiguity of measuring body motion in response to auditory stimuli.

OAE, sounds theorized to be generated by the outer hair cells of the cochlea, [n36] may be measured microphonically in response to a click stimulus. [n37-n43] The sensitivity of OAE screening in a typical hospital setting has been reported as 50% and the specificity, 53%. [n44] In addition, OAE requires interpretation by an audiologist for each of several (mean, 4) screening examinations performed on an infant.

ABR uses a click stimulus to elicit an electrical brainstem response measured by surface electrodes. [n11,n45-n47] The sensitivity of the ABR screener has been reported as 100% and the specificity, 97 to 98%. [n48-n50] AABR screening does not require interpretation by an audiologist. Universal newborn hearing screening by OAE [n43,n51,n52] and screening of NICU populations by conventional ABR and AABR [n49,n53-n55] have been reported. We chose AABR because of its superior operating characteristics and because of the lower cost of professional services required to achieve accurate screening results.

Incidence of Bilateral Congenital Hearing Loss

We defined bilateral congenital hearing loss as the number of infants for whom amplification was recommended, regardless of etiology. This number included infants whose loss exceeded 35 dB and for whom the loss was permanent. Our incidence was 1.4/1000 for the universal population (Table 5). Another study using an alternate screening method reported a universal incidence of 3/1000 [n43]; the difference between our incidence and theirs may be explained by the higher incidence for their NICU population, discussed in more detail below.

TABLE 5. Reported Incidence of Bilateral Congenital Hearing Loss [n79]

Infant Population	Incidence per 1000	n	Method of Evaluation	Reference
Universal n1	3.0	1850	OAE	White, 1993 [n43]
Universal	1.4	10	372	AABR Mason (current study)

Well	0	628	AABR	Joseph, 1993 [n50]
Well	1.2	1546	OAE	White, 1993 [n43]
Well	0.9	8971	AABR	Mason (current study)
NICU and high risk	21.0	373	ABR	Schulman-Galambos, 1979 [n80]
NICU	34.0	451	ABR	Berrick, 1985 [n59]
NICU and high risk	60.0	117	ABR	Bradford, 1985 [n56]
NICU	15.0	600	ABR	Durieux-Smith, 1987 [n57]
NICU and high risk	30.0	137	ABR	Swigonski, 1987 [n58]
High risk	37.0	322	ABR	Watkin, 1991 [n35]
NICU and high risk	12.0	405	ABR	McClelland, 1992 [n81]
NICU	13	304	OAE	White, 1993 [n43]
NICU	5.0	1401	AABR	Mason (current study)

n1 Universal, both well and NICU infants; NICU, neonatal intensive care unit; high risk, exhibiting one or more risk factors for hearing loss [n79]; OAE, otoacoustic emissions test; AABR, automated auditory brain stem response test; ABR, conventional auditory brain stem response test.

For the well-infant population, we reported an incidence of approximately 1/1000. This number represented a comparatively large group; only one other study focused on well infants as a separate population, [n50] and the size of that group was insufficient (n = 628) to identify any hearing loss. Others have reported data for a well population [n43] and found an incidence of 1.2/1000, which is not substantially different from ours.

The largest differences in incidence among studies may be seen in the NICU population. Our incidence of 5/1000 is markedly lower than that which others reported, and this difference may be explained by the inclusion in our NICU population of all infants who are not entirely normal (13% of our births), including minimally symptomatic infants. The higher incidence of hearing loss reported in other studies reflects populations of sicker infants. One study tested only infants whose gestation was <30 weeks, [n56] and 2 others tested only those requiring highly specialized intensive care; [n57-n58] these are regional tertiary facilities that receive infants who are at greater risk for death and disability. Poor compliance with follow-up examinations in the NICU population limited data in some studies. [n57-n59]

We noted that 38 infants (34 well, 4 in NICU) failed the initial hearing screening bilaterally and were unavailable at follow-up by our program (30 moved, 8 were noncompliant). Letters were sent to their families, and, when possible, referrals were made to other local newborn hearing screening programs. Because we found that 4% of infants who failed initial screening examination had true bilateral hearing loss, the 38 infants unavailable at follow-up may have included 1 infant who had bilateral congenital hearing impairment.

Remediation

Practical application of screening requires identification of remediable loss at an appropriate developmental stage and on early intervention. However, initiation of amplification may be delayed for >/=6 months after hearing loss is identified. [n17,n60-n62] Recent research has shown the benefits of early identification and amplification. Yoshinaga-Itano, et al [n19] reported that children in whom bilateral hearing loss was identified at birth or before age 6

months had statistically significantly larger lexicons and higher expressive language scores than children in which bilateral hearing loss was identified at age >/=6 months. At age 4 years, no differences in language development were found between the group in whom bilateral hearing loss was not identified until age 6 months and the group in whom bilateral hearing loss was not identified until age 2 years. This finding shows that hearing loss must be identified and amplification initiated before age 6 months.

No profound hearing losses were identified in our well-infant population. In addition, none of our hearing-impaired well infants had a risk factor for hearing loss. All hearing loss in well infants was remediable by amplification, and well infants who complied with hearing aid use and who regularly attended aural habilitation sessions showed speech and language development at and greater than age equivalency (Table 4). Well infants are the population for whom screening programs hold the greatest value, and because these infants gain the most by early identification and aural habilitation, society at large is spared the expense of remedial education.

The NICU population showed a notable lack of speech and language acquisition despite early identification of hearing loss. Pervasive medical problems and additional handicaps limited the use of hearing aids and reduced attendance at infant aural habilitation sessions. Neurologic cognitive impairments in this population limited speech and language development independent of auditory system function. Identification and amplification efforts in this population yielded less success.

Treatment of Unilateral Loss

Currently, no accepted standard interventions exist for infants who have unilateral impairment. To conserve resources, our program focused on infants who had persistent bilateral hearing loss because appropriate remediation is available for this population. Other programs have structured their efforts similarly. [n35,n49,n58,n59,n63,n64] Although infants with unilateral hearing loss were not tracked in our program, the AABR screening methodology may provide a mechanism to identify and to clarify the natural history of unilateral hearing loss.

Identification of unilateral hearing loss was not part of this hearing screening program. When individual treatment of unilateral loss is requested, the parents are counseled and the infant is monitored every 6 months to ensure that the status of the normal-hearing ear has not changed; referral to an otolaryngologist is made as needed. When the child reaches school age, unilateral amplification or a contralateral routing of signal instrument is considered. Teachers are informed of the student's unilateral hearing loss. Parents and the student are counseled regarding the hazards of noise exposure and contact sports.

Capture Rate

Satisfactory testing requires a quiet neuromuscular state. The test was unsuccessful for infants who were active or crying; these infants were recalled for outpatient testing. In 250 infants (2.3%), testing was unsuccessful because of myogenic interference; 237 were well infants and 13 were NICU infants. Myogenic interference resulted in exclusion of infants from the program in the beginning years. We now extend the test time in the nursery for these infants,

which saves the larger expense of aggressive efforts made to track them by phone, by letter, and by coordinating appointments with pediatricians. The increased skill and perseverance of our technicians led to the steadily declining number of infants not tested in the nursery because of myogenic interference, from 6% in year 1 to 0.05% in year 5.

The 5-year capture rate of our screening program (98%) compares favorably with rates (71% to 97%) previously reported. [n50,n51,n65-n67] Despite the trend toward shorter duration between birth and discharge, we were able to screen infants by using a single daily evaluation time. In the early years of our program, 2.6% of our infants were not screened. Successfully integrating our screening program into the regular nursery protocol led to a .1% rate of infants left unscreened during year 5, and all of the unscreened infants were successfully recalled for outpatient screening within 2 days of discharge from the hospital, producing a capture rate of 100%.

We recommend that other screening programs take steps to maximize the number of infants who receive nursery screening by extending the test time (ie, so that active infants may be soothed) and by recalling excluded infants for outpatient screening as soon as possible after discharge from the hospital.

False-positive Rate

The false-positive rate merits further discussion. Of the 376 infants who returned for repeated testing as outpatients, 96% had normal hearing in at least one ear (Table 3). We believe that they were correctly identified at initial screening and had a transient conductive loss, [n68] possibly caused by incomplete clearance of normal fetal middle ear fluid. Normal responses established within 1 month relieved concern regarding development of speech and language in this group.

Another subset of infants had bilateral transient or fluctuating loss at initial diagnostic examination (Table 3) but with serial testing showed slowly progressive improvement in hearing. Because of concerns related to acquisition of cognitive skills in the first year of life, we suggest that these might not be false-positive results and that these infants might benefit from amplification during the first year of life, even though the hearing losses might resolve later. Investigation related to the natural history and benefit of amplification in this subpopulation is suggested.

In 1995, 3 years into our program, we purchased a second automated screener and began rescreening all infants who failed initial screening. Rescreening took place at age 4 weeks; 14 infants failed the second-stage screening, and 4 had confirmed bilateral hearing losses. Using this two-stage protocol, the false-positive rate dropped to .3% (Table 6), yielding a positive predictive value [n69] of 27%. We recognize that a false-positive result may cause emotional stress for families until more definitive diagnostic testing is completed. The benefits of a two-stage screening process are that it reduces stress for families and reduces the number of time-consuming and costly diagnostic evaluations.

Cost

The cost of screening may be important to groups who are considering

establishing hospital-based neonatal hearing screening programs. Cost varies regionally, and confusion may arise when comparing the cost to do a test, the cost to the person who pays for the test, and the cost to the community if the test is not done. Because our program is a prepaid health care plan, members are not charged; nonmembers are charged $ 30. We report a per infant screening cost of $ 17 (Table 7). This cost may be compared with the charges for existing state programs that screen newborns. Current charges for phenylketonuria screening examinations range from $ 17 to $ 50 each, and for hypothyroid screening examinations, charges range from $ 28 to $ 50 each. The estimated incidence of phenylketonuria in the United States is 1/6000 to 1/25 000, [n70] and the estimated incidence of congenital hypothyroidism is 1/5000. [n71]

TABLE 6. False-positive [n82] n1 (FP) Rate in Universal Infant Hearing Screening Programs

FP rate, %	n	Method of Evaluation Population n2	Reference
48.0	117	OAE, universal	Jacobson, 1994 [n44]
28.0	145	MDM, well infants	Durieux-Smith, 1985 [n34]
21.0	1850	OAE, universal	White 1994 [n83]
16.0	4915	HHR, MDM, NICU	Swigart, 1986 [n32]
14.0	197	MDM, NICU	Marcellino, 1985 [n29]
7.5	745	ABR, NICU	Cevette, 1984 [n34]
3.5	10 372	AABR, universal	Mason (current study)
3.3	189	AABR, NICU	Hall, 1987 [n48]
1.0	398	AABR, NICU	Herrmann, 1995 [n49]
.6	628	AABR, well infants	Joseph, 1939 [n50]
.3	850	OAE, universal, 2-stage screening	White, 1994 [n83]
.2	451	ABR, NICU	Herrmann, 1995 [n49]
.3	4022 n3	AABR, universal, 2-stage screening	Mason (current study)

n1 False-alarm rate for the protocol is the percentage of normal hearing infants in the nursey who are incorrectly called hearing impaired. True normals = those who pass on initial screen and those who pass on diagnosis retest. [n82] All FP rates refer to a single-screen method except as noted.

n2 Universal, both well and NICU infants; OAE, otoacoustic emissions test; MDM, motion detection method; HRR, high risk register; AABR, automated auditory brainstem response test; ABR, conventional auditory brainstem response test; NICU, neonatal intensive care unit infants.

n3 The n reported here encompasses 2 years of births.

TABLE 7. Costs Associated With Screening for Bilateral Hearing Loss in a 5-Year Period

	Cost Per Infant,

	Number of Infants	Total Cost, $	$
Inpatient screening	10 372	-- n1	--
Technician time	--	109 000	--
Disposable items	--	59 000	--
Reusable equipment	--	11 000	--
Total	--	179 000	17
Outpatient testing			
Reusable equipment (second AABR machine)	--	5000	--
Behavioral testing of infants not screened	212	6400	30
Follow-up of infants not screened	395	4000	10
Rescreening by AABR	93	2800	30
Diagnostic ABR (includes repeated tests)	310	37 200	120
Tympanometry	290	4400	15
Outside referral for DPOAE n2	15	1500	100
Administrative audiologist services n3	--	26 000	--
Total cost to confirm true bilateral loss	15	266 300	17 750

n1 -- = not applicable.

n2 DPOAE, distortion product otoacoustic emissions.

n3 The administrative audiologist spends 4 hours each month maintaining the databases and a total of 4 hours each week administering the program; costs are evaluated on a per-hour basis.

This screening program was inspired by legislation that recognized the benefits and cost savings obtainable (from speech and language acquisition, avoidance of special educational programs, and improved quality of life) when infants' hearing loss is detected and treated with amplification. The cost of not identifying hearing impairment in one person may reach 1 million dollars. [n72] Considering the cost of screening and the incidence of hearing loss we identified, we conclude that the cost effectiveness of our program compares favorably with that of other state screening programs.

Beyond immediate financial consideration is the evaluation of hearing loss caused by trauma, infection, or heredity (in cases in which the latter causes progressive hearing loss). Our data differentiated only between acquired and congenital hearing impairment.

CONCLUSION

AABR was used to screen a large newborn population for bilateral hearing loss. The incidence of congenital bilateral loss in a large population of well infants has not previously been reported. Hearing loss identified in the well-infant population was remediable by amplification. The cost of identifying infants' hearing loss at birth was a fraction of the anticipated cost of providing educational and community services to people whose hearing loss is

found later. We recommend a two-stage universal newborn screening protocol, amplification before age 6 months, and regular attendance of infants at aural habilitation sessions. We feel that further research is warranted for infants who have transient and fluctuating hearing losses because this group may benefit from temporary amplification. [n73-n84]

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Neonatal hearing screening with an automated auditory brainstem response screener in the infant's home

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Universal neonatal hearing screening is essential if all infants with congenital or perinatally acquired hearing impairment are to begin treatment before the age of 6 months to facilitate development of speech, language, communication and academic skills. Screening cannot always take place in hospital because of the increase in very short-stay deliveries. Therefore screening in the home may be necessary to achieve a high level of screening. We describe a feasibility study with an automated auditory brainstem response (AABR) screener in the infant's home as part of the service offered by the Well Baby Clinics in the Netherlands. Of the 277 infants who completed the screening 266 had the result "pass", 7 "refer" and 4 had inconclusive results. The mean time needed per screening was 18 min. This study shows that neonatal hearing screening by nurses using an AABR infant screener in the home is feasible. □*Automated auditory brainstem response screener, congenital hearing impairment, home screening, neonatal hearing screening*

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Moderate to severe congenital or perinatally acquired hearing impairment may cause serious lifelong handicap (1). The chances for development of speech, language, communication and academic skills are improved when the diagnosis is made before the age of 3 months and treatment is started before the age of 6 months (2, 3). To achieve this goal, hearing screening must be carried out in the neonatal period (4). Behavioural distraction screening at the age of 8 or 9 months means that the child is at least 12–18 months (and often much older) before treatment can be started (5, 6).

The prevalence of moderate to severe hearing impairment is approximately 1 per 1000 healthy newborns (7). It is much higher in graduates of neonatal intensive care units with figures of 1–5% being reported (8, 9). Even though "targeted" screening of high-risk infants has a high yield, more than 40–50% of children with hearing impairment are not discovered if screening is restricted to this group (4). Therefore universal neonatal hearing screening is necessary.

Several studies have taken place with neonatal hearing screening methods but all have been confined to hospital settings (10, 11, 12). Because of the world-wide trend towards shorter hospital stays after delivery, hearing screening is not always possible during the short time the neonate is in the hospital. Therefore screening in the home may be necessary if a high level of screening is to be achieved. However, since there is practically no information available on neonatal hearing screening outside hospital, we decided to carry out a prospective study to evaluate the feasibility of neonatal hearing screening in the infant's home.

We regarded the Netherlands as an ideal testing ground for home screening because of the high rate of home deliveries and very short-stay hospital deliveries. This feasibility study was carried out within the framework of care provided by the Well Baby Clinics during the regular home visit made to all homes by the child care district nurse when the infant is 10–14 days old.

The conventional auditory brainstem response (ABR) is regarded as the most objective method of evaluating peripheral auditory function in newborns and very young infants (12). However, it is a relatively time-consuming method needing highly skilled technicians for performing it and a trained audiologist for interpretation. For these reasons equipment has been developed for automated auditory brainstem response (AABR) screening.

We planned to carry out the home screening with an AABR method—the Algo-1 Plus (Natus Medical Inc., San Carlos, CA, USA). This is probably the most highly developed AABR screener currently available. The Algo-1 Plus has been developed solely for the purpose of screening for handicapping hearing impairment in young infants. It is portable, weighing only 3.5 kg and is battery powered, which is very important for use in the home.

Several clinical trials have been carried out comparing the use of the Algo-1 Plus with the conventional ABR. In a multi-institutional clinical trial, Hall et al. (13) found a sensitivity of 100% with a specificity of 96.7%. Kilney found a sensitivity of 100% and a specificity of 96.15% (14). Using a controlled protocol Peters found a sensitivity of 100% and a specificity of 98.7% (15), and Jacobsen et al. found a sensitivity of 100% and a specificity of 96%

Table 1. Infants in study with risk factors associated with sensorineural and/or conductive hearing loss for use with neonates, according to the Joint Committee on Infant Hearing 1994 Position Statement.

	Risk factors	*n*
1	Family history of hereditary childhood sensorineural hearing loss	12
2	*In utero* infection, such as cytomegalovirus, rubella, syphilis, herpes and toxoplasmosis	–
3	Craniofacial anomalies, including those with morphological abnormalities of the pinna and ear canal	–
4	Birthweight less than 1500 g	1
5	Hyperbilirubinaemia at a serum level requiring exchange transfusion	–
6	Ototoxic medications, including but not limited to the aminoglycosides, used in multiple courses or in combination with loop diuretics	–
7	Bacterial meningitis	1
8	Apgar scores of 0–4 at 1 min or 0–6 at 5 min	–
9	Mechanical ventilation lasting 5 days or longer	–
10	Stigmata or other findings associated with a syndrome known to include a sensorineural and/or conductive hearing loss	1

(16). The validity of the method has been proven sufficiently; this was not the aim of the present study, which was confined to the feasibility of its use in the home situation as part of the care supplied by the Well Baby Clinic.

We have experience with the Algo-1-Plus in the High Care Baby Unit and Maternity Unit of the Zuiderziekenhuis in Rotterdam where screening is carried out by specially trained volunteers. The total screening time there is approximately 19 min (17).

Subjects and methods

This study was carried out in the town of Barendrecht in the South West of the Netherlands (population ± 21 000) as an integrated part of the care provided by the Well Baby Clinic. All infants born during the period beween January 1st and December 1st 1995 to inhabitants of the town of Barendrecht were eligible for entry into the study. The number of live births in this period was 288. The parents of four infants declined inclusion in the study. Screening

Fig. 1. Mother and infant during hearing screening with an automated auditory brainstem response screener in the infant's home.

was attempted in 284 infants. The mean age of the infants at screening was 13 days and the mean birth weight was 3380 g.

The infants with risk factors for hearing impairment in the study group [using the criteria defined by the American Speech-Language-Hearing Association in the Joint Committee on Infant Hearing 1994 Statement (4)] are presented in Table 1.

Equipment

The Algo-1 Plus has been extensively described by Kilney et al. (14) and Jacobson et al. (16). It is composed of the following elements: an electroencephalographic system (EEG), a stimulus generating system, ambient noise and myogenic activity detection systems and the ABR detection algorithm. All these components are served by and fed into a central microprocessor. This interprets the outcome of the tests and gives a "pass" or "refer" result which is automatically printed out. A "pass" outcome indicates that the data were sufficient to discriminate between the presence of a response plus noise and the presence of only noise or no response at a confidence level of > 99.8%. The stimuli used by the Algo-1 Plus are alternating 35 dB nHL clicks with an acoustic frequency spectrum of 700–5000 Hz presented monaurally at a rate of 37 pulses per second. The users need little training and do not need an audiological background.

Screening during the home visit

The screening was carried out by the child care district nurses attached to the Well Baby Clinic. The three nurses involved were trained during a 3-h session at the Zuiderziekenhuis.

The Algo-1 Plus was transported in a rucksack as the nurses usually travelled by bicycle. The home visit was planned to take place shortly after the baby had been bathed and had just been fed. When the nurse visited the home she began by cleansing the skin with a scrub preparation. Then three silver chloride electrodes were applied—one on the forehead, one at the nape of the neck and one on the cheek or upper chest. The electrodes were connected to the Algo-1 Plus. Disposable transparent "ear couplers" with adhesive backing were placed over the infant's ears and the tubes through which the sound stimuli come were connected with the ear couplers. When the baby fell asleep the "on" switch was pressed and screening proceeded automatically with the result being printed out. This is illustrated by Fig. 1.

Meanwhile the nurse carried out a routine interview with the parents concerning the pregnancy, delivery, feeding etc., as well as explaining the care offered by the Well Baby Clinic.

The screening process

Infants were screened for hearing impairment in 1 or both ears. When the result "refer" was given for 1 or both ears or the screening could not be carried out due to restlessness of the infant an appointment was made for a repeat screening within 2 weeks. It was hoped that if the result "refer" was due to transient conductive hearing loss that this would be resolved at the second screening attempt. In this way the number of infants refered unnecessarily for diagnostic investigations could be reduced.

If the result "refer" was found twice the child was referred immediately for diagnostic investigations to the regional audiological centre. Unfortunately, because of the waiting list at the centre, the time between referral and performance of diagnostic investigations was approximately 6 weeks.

If the result "pass" was found the parents were told that the screening test had been passed but that constant alertness is important and that if there is any doubt about speech- language development or hearing, at any age, then medical advice should be sought. All these infants are also followed-up with behavioural distraction hearing screening at the age of 9 months according to the usual practice in the Well Baby Clinic. At the time of writing the results are not available as all infants have not reached the required age for distraction screening.

If neonatal hearing screening could not be completed after two attempts because of restlessness of the infant, the child received extra attention with regard to speech–language development at visits to the Well Baby Clinic and was also followed-up with distraction screening at the age of 9 months.

Feasibility

The feasibility was assessed on the time needed for screening and acceptance by parents. The time needed was calculated as follows: the time for a home visit with neonatal hearing screening minus the time for a home visit without neonatal hearing screening. The time for a similar home visit without neonatal hearing screening is known from the records of the nurses prior to this study. The reactions of the parents to the screening were assessed in a structured interview.

Also noted were the results of the screening: "pass" or "refer" or if screening could not be carried out due to restlessness of the baby.

Results

Outcome of screening

At the first screening attempt of 284 infants, 247 had the result "pass", 18 "refer" and in 19 infants screening could not be completed due to restlessness. Therefore 37 infants were eligible for a second screening.

Parents of seven infants refused this (in one case after the result "refer" and in six cases where the first attempt could not be completed). The following results were obtained in the remaining 30 infants: 19 "pass", 7 "refer" and 4 not completed. The total number of infants who proceeded

Table 2. Results of screening with an AABR in the infant's home.

Category	*n*
Total population:	288
Total number in screening process:	284
Outcome of first screening attempt:	
"Pass"	247
"Refer"	18
Not completed	19
Outcome of second screening attempt of 37 infants	
"Pass"	19
"Refer"	7
Not completed	4
Refusal of further investigation	7
Outcome of 277 infants who proceeded through screening process	
Not completed	4/277 (1.44%)
"Pass"	266/277 (96.03%)
"Refer"	7/277 (2.53%)
Outcome of 7 "refer"	
Refusal further investigation	1
Normal audiological investigation	4
Severe hearing loss >100 dB	1
Abnormal conventional ABR with normal OAE	1

through the screening process was 277 (96.2%). The results from these were as follows: 266 "pass" (96.03%), 7 "refer" (2.53%), and 4 not completed (1.44%).

The reason screening was not completed was usually restlessness of the infant. In one case it was due to a flat battery.

Of the seven infants with the result "refer" at the second screening the parents of one infant refused further diagnostic investigations. Further diagnostic investigation using conventional ABR revealed normal hearing in four infants. One infant showed an abnormal interval between Wave I and Wave V on the conventional ABR tracing, probably due to delayed ABR maturation. This abnormal interval would not be interpreted as part of the normal wave-form by the template matching detection algorithm of the Algo (which determines the presence of an ABR). This would explain why the Algo had given the response "refer" in this case. This child had a normal response with otoacoustic emission investigation.

Diagnostic investigation of one infant revealed bilateral hearing loss of >100 dB. This infant had had bacterial meningitis during the first week of life. Habilitation was begun and hearing aids placed before the age of 6 months. Table 2 gives the full results of the screening.

Duration of screening

The average time for the whole home visit (including hearing screening) in 267 visits was 78.5 min (SD 16.56, range 45–150 min). The usual time for a similar home visit (without hearing screening) from the Well Baby Clinic is 60 min. Thus, the mean extra time needed for the screening was 18 min.

There were a few peaks in the birth rate in the town when it was extra busy for the nurses and a separate visit was made for the hearing screening. This was also the case when a second screening was necessary. For these 37 visits for the screening alone the average time was 35.3 min (SD 12.83, range 10–60 min)

Acceptance

Even though neonatal hearing screening was completely new in the area, parents of only four infants declined entry into the screening process. This is an acceptance level of 98%. Of the parents who participated, almost all (97%) were extremely enthusiastic about the screening as expressed in a structured interview.

In the six cases where screening could not be completed and a repeat attempt was refused parents gave no clear reason for refusal.

Discussion

Neonatal hearing screening using the Algo-1 Plus is feasible within the framework of the care provided by the Well Baby Clinics in the Netherlands. The extra time needed for a home visit in this study (including unpacking the equipment, attaching electrodes, waiting for the screening to finish, repacking equipment and the necessary clerical registration) was 18 min per infant. The extra time needed for the home visit made it more difficult for the nurses to plan the visits, especially because of the peaks in the birth rate during the study period.

A new modification of the Algo-1 Plus (the Algo-1 E) which reduces the time needed for screening to less than 6 min has just become available (18). This will make home screening even quicker. However, in countries where home visits are not part of the regular health care systems, the travel time could make home screening less attractive.

Even though a high correlation has been reported by several authors (13–16) between the Algo and the conventional ABR there was a discrepancy in our study in that four infants with "refer" in the Algo screening had a normal conventional ABR. This may be explained by the fact that in the studies with the high correlation the Algo screening and conventional ABR were carried out simultaneously or directly after each other, and in our study there was a time gap of approximately 6 weeks between the screening and the conventional ABR. The difference may be due to a change in auditory status of the infant in the meanwhile, e.g. due to clearing of effusion in the middle ear.

The Algo is extremely suitable for use by workers without an audiological background in the home situation as it is fully automated. However, if the infant does not sleep it may not be possible to complete the screening and get a result.

Even though almost all parents in the area agreed to participate in the screening programme, it was disappointing that parents did not always accept a second screening attempt—whether required because of "refer" or because

screening could not be completed due to restlessness of the infant. We hope that the new version of the Algo—the Algo-1 E—may be more acceptable, as it is not necessary to "prep" the skin before applying the electrodes and the screening time is shorter. Screening could not be performed more conveniently than in this programme as it is done in the infant's own home, so it is difficult to improve on this aspect.

It is rather worrying that parents of one infant refused further diagnostic investigations even though the infant had the result "refer" on two occasions. The fact that diagnostic investigations (which are not painful or dangerous) are not acceptable to some parents constitutes a very difficult and serious problem to the screening programme. This means that a lot of work needs to be done to educate parents on the benefits of early screening and diagnosis of hearing impairment.

Larger studies are needed to see more precisely what the costs in time, material and personnel are and whether later distraction screening can be replaced by neonatal hearing screening with the Algo. This study shows that neonatal hearing screening in the home situation using an automated ABR infant screener is feasible.

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LEVEL 1 - GROUP 3 - 2 OF 2 EMBASE References

EMBASE
(THE EXCERPTA MEDICA DATABASE)

TITLE: Refractory properties of auditory brain, stem responses evoked by electrical stimulation of human cochlear nucleus: Evidence of neural generators

AUTHOR: Waring M.D.
United States

SOURCE: M.D. Waring, Electrophysiology Laboratory, House Ear Institute, 2100 West Third Street, Los Angeles, CA 90057; Ireland; Journal

JOURNAL: ELECTROENCEPHALOGR. CLIN. NEUROPHYSIOL. EVOKED POTENTIALS 1998 108/4 (331-344)

JOURNAL-NAME: Electroencephalography and Clinical Neurophysiology - Evoked Potentials

CODEN: ECNPE

ISSN: 0168-5597

LANGUAGE: ENGLISH

SUMMARY-LANGUAGE: ENGLISH

ABSTRACT: In this study of electrically-evoked auditory brain-stem responses (EABRs) elicited by cochlear nucleus stimulation, 3 waves were identified after the initial wave that is directly initiated by the electric stimulus. Varying the rate of periodic stimulation or the interval between pairs of stimuli revealed that the shorter the latency of a wave, the faster it recovered from activation (i.e. shorter refractory period). The slow recovery of the third wave and an accompanying contribution to the second wave could be accounted for by postsynaptic generation in the two medial superior olivary nuclei (MSO); the faster recovery of another contribution to the second wave by generation in an axonal tract bending around the contralateral MSO; and the fastest recovery of the first wave by another axonal pathway having larger axons. Comparison with the relative latencies and spatial distribution of an acoustically-evoked auditory brain-stem response (AABR) indicated that the third wave corresponds to wave V, the second to wave IV (called IVb), and the first to a wave that precedes wave IV (called IVa). The anatomical interpretations for the two later waves of the EABR are consistent with most of the extant data on the neural generators of AABR waves IV and V. Thus, the present data and analysis strengthen the identification of the electrically evoked responses as EABRs and provide a firmer foundation for intra-operative EABR monitoring to assist auditory brain-stem implant placement.

EMTREE-CODE: A8.30.20.20; A9.10.10; G2.600.140.110; E8.540.800.70.70; G2.320.70.70; E5.610.280; E2.690.265.610; E5.610.280.600; H3; E1.570.675; E2.440.675; E2.675.675; E5.570.675; N1.20.665.665.675; B2.60.60.60.10.40; J2.20.10; L2.60; L2.20; J2.40.10; L1; J1.100; J1

MEDICAL-DESCRIPTOR: cochlear nucleus AA; brain stem response AA; auditory response BA; electrostimulation BA; brain depth stimulation BA; waveform BA; patient monitoring BA; human BA; male BA; female BA; clinical article BA; adult BA; article BA; priority journal BA

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1ST STORY of Level 1 printed in FULL format.

Business Wire

August 14, 1998, Friday

DISTRIBUTION: Business Editors

LENGTH: 737 words

HEADLINE: S&P Asgns '**AAbr**-' Corp Cred Rtg to Rossi Residencial

DATELINE: NEW YORK

BODY:

August 14, 1998-- Standard & Poor's assigned its double-'Abr'-minus corporate credit rating in the Standard & Poor's and Fundacao Getulio Vargas National Scale to Rossi Residencial S.A. Standard & Poor's also affirmed its double-'B'-plus global scale and double-'B'-minus local and foreign currency ratings on Rossi Residencial S.A. The outlook is stable.

The ratings on Rossi Residencial S.A. reflect the company's strong market position, solid management team, moderate financial policies, and good financial position. These strengths are tempered by its limited history as a public company and the economic risks inherent to Brazil. Rossi is the homebuilding subsidiary of the Rossi Group, a Brazilian company involved in construction and engineering activities. Rossi was spun off from the parent company in a December 1996 reorganization in which Rossi acquired all the residential building operations of the Rossi Group. Today, Rossi is one of the largest homebuilders in Brazil and the leading builder in Sao Paulo, where it has about an 7% market share. Notably, the Sao Paulo metropolitan area contains 13% of Brazil's population and its residents have an average per capita income that is double that of the rest of Brazil.

Rossi develops and finances apartments for middle- and lower-middle-income buyers, which is a very large segment of the population. Through its innovative, well-recognized financing programs (Plano 100 and Vida Nova), the home buyer makes monthly installment payments from the signing of the contract, usually at least two years before the move-in date. This in effect provides working capital to Rossi for the construction costs of its projects and helps to keep customer delinquency rates low, given the substantial upfront payments (approximately 35% of the purchase price) that the buyers make to Rossi before delivery of the home. Until December 1997, Rossi financed the remaining 60% (the upfront payment was then 40%), bearing the delinquency risk of its receivables. In January 1998, a new financing mechanism was established, in which the remaining 65% of the apartment price will be financed directly by banks. It is expected that this new system will further diminish the delinquency risk for Rossi Residencial. Management expects that the new system will finance 70% of the new sales in 1998 and 100% of the new sales in 1999.

Rossi's financial policies appear to be appropriate, particularly its moderate use of debt, its suitable hedging strategies, and its reserve policy for accounts receivable. The company's capital structure is moderately

leveraged, resulting in strong debt service coverage. However, Rossi expects to shift its debt structure going forward to rely on U.S. financing, which will expose the company to significant foreign exchange risk, due to its local currency-denominated revenue base. Historically accounts receivables from homebuyers appear to be of overall good quality (low 1.6% average delinquency rate). However, in February 1998 the cumulative delinquency ratio went up to 2.38%, as a consequence of a slowdown in the economic environment in Brazil. This increase in delinquency rates is somewhat offset by advanced installment payments made by clients during the course of the contract. Financial flexibility is supported by good internal liquidity and approximately $ R 100 million in available, uncommitted bank facilities. OUTLOOK: STABLE

Management's business plan and financial policies appear to be appropriate, which should enable the company to somewhat mitigate the apparent risks of operating within the relatively volatile Brazilian economy. While the

Brazilian housing market is subject to cyclicality and, the substantial housing deficit in the country (10 million to 13 million) should continue to provide long-term demand for Rossi's attractively priced homes.---CreditWire

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LANGUAGE: ENGLISH

LOAD-DATE: August 15, 1998

2ND STORY of Level 1 printed in FULL format.

PR Newswire

August 14, 1998, Friday

SECTION: Financial News

DISTRIBUTION: TO BUSINESS EDITOR

LENGTH: 667 words

HEADLINE: S&P Assigns '**AAbr**-' Corporate Credit Rating to Rossi Residencial

DATELINE: NEW YORK, Aug. 14

BODY:
Standard & Poor's assigned its double-'Abr'-minus corporate credit rating in the Standard & Poor's and Fundacao Getulio Vargas National Scale to Rossi Residencial S.A. Standard & Poor's also affirmed its double-'B'-plus global scale and double-'B'-minus local and foreign currency ratings on Rossi Residencial S.A. The outlook is stable.

The ratings on Rossi Residencial S.A. reflect the company's strong market position, solid management team, moderate financial policies, and good financial position. These strengths are tempered by its limited history as a public company and the economic risks inherent to Brazil. Rossi is the homebuilding subsidiary of the Rossi Group, a Brazilian company involved in construction and engineering activities. Rossi was spun off from the parent company in a December 1996 reorganization in which Rossi acquired all the residential building operations of the Rossi Group. Today, Rossi is one of the largest homebuilders in Brazil and the leading builder in Sao Paulo, where it has about an 7% market share. Notably, the Sao Paulo metropolitan area contains 13% of Brazil's population and its residents have an average per capita income that is double that of the rest of Brazil.

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Rossi's financial policies appear to be appropriate, particularly its moderate use of debt, its suitable hedging strategies, and its reserve policy for accounts receivable. The company's capital structure is moderately leveraged, resulting in strong debt service coverage. However, Rossi expects to shift its debt structure going forward to rely on U.S. financing, which will expose the company to significant foreign exchange risk, due to its local currency-denominated revenue base. Historically accounts receivables from homebuyers appear to be of overall good quality (low 1.6% average delinquency rate). However, in February 1998 the cumulative delinquency ratio went up to 2.38%, as a consequence of a slowdown in the economic environment in Brazil. This increase in delinquency rates is somewhat offset by advanced installment payments made by clients during the course of the contract. Financial flexibility is supported by good internal liquidity and approximately 100 million in available, uncommitted bank facilities.

OUTLOOK: STABLE

Management's business plan and financial policies appear to be appropriate, which should enable the company to somewhat mitigate the apparent risks of operating within the relatively volatile Brazilian economy. While the Brazilian housing market is subject to cyclicality and, the substantial housing deficit in the country (10 million to 13 million) should continue to provide long-term demand for Rossi's attractively priced homes. -- CreditWire

SOURCE Standard & Poor's CreditWire

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LANGUAGE: ENGLISH

LOAD-DATE: August 15, 1998

5TH STORY of Level 1 printed in FULL format.

Writer's Digest

March, 1998

SECTION: No. 3, Vol. 78; Pg. 13; ISSN: 0043-9525

IAC-ACC-NO: 20333478

LENGTH: 1982 words

HEADLINE: The fixed is in; rondeau redouble form; Poetry; Column

BYLINE: Bugeja, Michael J.

BODY:

Peskier than the rondeau, simpler than the villanelle, the rondeau redouble is ideal for poets attempting fixed patterns.

Editors are swamped with sonnets and villanelles--the two most popular formal poems. But they rarely, if ever, see a rondeau redouble. Poets shun the form, claiming the pattern is too complex.

Not so if you compose step-by-step.

Fact is, the rondeau redouble is perfect for love poetry or lyric meditations. Dorothy Parker, urbane poet and freelancer of the 1920s, composed a few, including her well-known "Rondeau Redouble" (below right).

As you read her poem, note how she alternates two rhymes, begins and ends with the same words, and repeats, in order, the lines of the first stanza at the ends of stanzas 2-5 (for the moment, ignore the markings after each line).

Parker's poem has some obvious flaws. Her diction is a bit antiquated (as in "cerements," "bedight"), and her voice borders on the sentimental (as in "And this, O love, my pitiable plight"). But the poem resonates because it is executed well according to the strict pattern.

Learn the Patterns

Sung by minstrels or court suitors in the 15th and 16th centuries, French forms have withstood the test of time and translate well into English. You can compose these forms using any metric line, long or short, iamb or trochee--whatever length and sound suits your subject. The form features two or three rhymes, a fixed pattern, repeating words or lines and, occasionally, a refrain or rentrement (pronounced "ron-'tray-mon" and meaning "to enter again").

You literally enter the rentrement again--as on a computer screen--repeating the first words from the first line somewhere else in the poem, according to the

scheme.

The box on page, 14 lists five poem forms and their patterns. (The pattern for the rondeau redouble also appears to the left of Parker's verse.) As you can see, these really are fixed forms. You can't vary them; each is meant to set a certain mood. And although rhymes in English are scarcer than in their native French, English has two advantages: It's richer in homonyms, and it's also more positional, changing the meaning of a phrase merely by where you place a word within it (as in: "Drink tea this instant" or "Drink this instant tea"). Those variations are perfectly allowable, especially in the rondeau redouble.

In any case, if you are new to French forms, you might want to compose a rondeau or two before attempting the redouble.

POETRY

(You'll learn much about the rentrement.) But if you've already composed a successful villanelle (for more on that form, see the August '97 poetry column), you should have no problem with the redouble.

Follow the Steps

As in any form poem, the rondeau redouble, has specific requirements:

Step #1. Blend topic with structure. Typically the theme is stated in the rentrement. The first four lines repeat at the end of each ensuing stanza. As such, the form works well if you want to tell a story in stages; or depict a scene like a slide show; or make an argument point by point.

Finally the "repeating" lines are, in a real sense, punch lines. Louis Untermeyer, the famous WWII-era anthologist, used the rondeau redouble for light verse. You can add to the comic effect with double or unanticipated rhymes, as in these opening lines from one of my rondeau redoubles:

The Virgin Mary Appears on Eyewitness News

She wearies the Vatican, missing as

icon

In the papal church, above the

candelabras;

Midnight the mobile unit turns its

Mike on,

Channeling audio abracaclabras.

Step #2. Create a thematic rentrement within an intriguing first line. You must word the rentrement carefully because it has three functions: It begins the poem, it establishes theme and it ends the poem. Moreover, its first line is repeated as the eighth line.

Your poem's title should ground the topic. So use the rentrement to embed the theme with a few first words or a phrase.

In another rondeau redouble, "Assemblies of God," I wanted to use the refrain: "to be made." That seemed to play off the title and echo the theme of creation. The challenge was then to attach the phrase "to be made" to an effective first line.

You can't afford false starts when writing French forms because the entire structure will collapse later in the poem. To prevent that, I drafted several "first" lines, including the rentrement in each. From those I chose the most intriguing one: "To be made in the image of deus." It offered a good selection of rhymes and best blended theme with tide and topic.

Step #3. Craft opening lines that pivot on homonymic or repositioned words. Your first four lines repeat throughout the poem, so you need to focus on each one as much as you have the rentrement. In general, however, you want these lines to:

* Read as complete units

* Rhyme to a distinct rhythm--mostly iambic (light/hard stress) for more serious poems, mostly anapestic (two light/one hard stress) for more humorous ones

* Change meaning in subsequent lines.

Here are the opening lines of "Assemblies of God":

To be made in the image of deus

And deny it--your body, a masquerade--

To tally the beads of your abacus

And ascertain losses, the burial spade

In the dug meadow....

Stop composing after the first stanza and see if you will be able to change meanings of each line by using homonyms or by repositioning nonrhyming words. Use puns, word plays or other variations. In my drafting, I found that "To be made in the image of dens" could become "To be the maiden image of deus," and "And ascertain losses, the burial spade" could become "And loss is certain as the burial spade."

At least two of your four opening lines should be as malleable as these. If not, keep reworking the first stanza until they are. Rondeau redoubles must startle the reader by transforming meanings throughout the form.

Step #4. Emphasize the next-to-last line. The next-to-last line of a poem typically is no more or less important than any other line. But in the rondeau redouble, this line launches the rentrement and completes the theme. As such,

experiment with next-to-last lines the same way you did the first line in Step #1.

In "Assemblies of God," the line before my next-to-last one reads: "Life is not illusion, nor death chanade." My task was to write a next-to-last line

'that would connect to that one and the rentrement. I tried: "But something greater, like the impetus" and "But music, a universal opus" before choosing "But light, you are light yet and synthesis." It launched the final refrain, completed the theme and evoked a universal truth: Even at death we are light that has yet to be integrated, to be made.

Enjoy the Process

Mastering the many components of this form, you learn patience and perfection. You'll also appreciate how rhyme harmonizes with topic or theme, heightening humor or drama. You learn the rewards of revision before you even finish a first draft because you'll be experimenting with "draft" lines and word plays.

Don't begin a rondeau redouble unless you love words--how they change meaning, how phrases combine and create new meaning, how lines blend meaning. But then, such love is essential stuff for any poet.

RELATED ARTICLE: Rondeau Redouble

(And Hardly Worth the Trouble, At That)

The same to me are somber days and gay.	(R)A1
I Though joyous dawns the rosy morn, and bright,	B1
Because my dearest love is gone away.	A2
Within my heart is melancholy night.	B2
My heart beats low in loneliness, despite	b
That riotous Summer holds the earth in sway.	a
In cerements my spirit is bedight;	b
The same to me are somber days and gay.	A1
Though breezes in the rippling grasses play,	a
And waves dash high and far in glorious might,	b
I thrill no longer to the sparkling day,	a
Though joyous dawns the rosy morn, and bright,	B1

Ungraceful seems to me the swallow's flight; b

As well might heaven's blue be sullen gray; a

My soul discerns no beauty in their sight b

Because my dearest love is gone away. A2

Let roses fling afar their crimson spray, a

And virgin daisies splash the fields with white, b

Let bloom the poppy hotly as it may, a

Within my heart is melancholy night. B2

And this, O love, my pitiable plight b

Whenever from my circling arms you stray, a

This little world of mine has lost its light... b

I hope to God, my dear, that you can say a

The same to me. (R)

RELATED ARTICLE: Fixed Forms Rules and Patterns

Here are the basic rules for deciphering the patterns of these poems:

* Rhyming lines are designated with the same lowercase letters--a, b, c and so forth.

* Stanza breaks are indicated with a space, as in aba aba. That sequence of letters translates as "two three-line stanzas with a rhymes at the end of lines 1, 3,4, 6 and b rhymes at the end of lines 2 and 5."

* When a full line repeats, you capitalize the letter A, B, C and so forth. A line designated A means the end-word of the repeating line rhymes with the end-word of a nonrepeating a line.

* If two or more lines designated by the same rhyming letter must be repeated, you add a number to the capital letter, as in abaB1 babB2. That means lines 81 and B2 are different but both rhyme with b in these two four-line stanzas.

* The rentrement is designated within parentheses and attached to a specific line, as in (R)a for a refrain within a nonrepeating line or (R)A for a repeating one. (By the way, you don't have to rhyme the rentrement, but if you do, it should rhyme a or b. A quick example of a rhyming rentrement: "The small refrain returns again.")

Here are the patterns, with explanations, for five common fixed forms.

Ballade (ababbcbC ababbcbC ababbcbC bcbC): Three rhymes in four stanzas--three octaves and one quatrain (or envoy)--all ending with the repeating eighth line, or C

Troilet (AB aA ab AB): Two rhymes in four couplets. The first line repeats as the fourth and seventh lines and the second line repeats as the last line.

Villanelle (A1bA2 abA1 abA2abA1 abA2 abA 1A2): Two rhymes in six stanzas. The first line repeats as lines 6, 12 and 18; the third line rhymes with the first and repeats as lines 9,15 and 19.

Rondeau [(R)aabbo **aabR** aabbaR]: Two rhymes in three stanzas. No repeating lines, but the second and third stanzas end with the first words of the first line.

Rondeau Redouble [(R)A1B1A2B2 babA1 abaB1 babA2 abaB2 babaR]: Two rhymes in six stanzas. The rentrement is embedded in the first line, which repeats as line 8; the second as line 12; third, line 16; fourth, line 20. The last line of the five-line final stanza repeats the first few words of the poem's first line.

Michael J. Bugeja's latest collection, Talk (University of Arkansas Press), features two rondeau reboubles, along with various other fixed forms. For more information on formal poetry, see his Art & Craft of Poetry (Writer's Digest Books).

GRAPHIC: Other; Illustration

LANGUAGE: ENGLISH

IAC-CREATE-DATE: June 8, 1998

LOAD-DATE: June 09, 1998

7TH STORY of Level 1 printed in KWIC format.

SEPTEMBER 16, 1997, TUESDAY

SECTION: CAPITOL HILL HEARING WITH WHITE HOUSE PERSONNEL

LENGTH: 17480 words

HEADLINE: SENATE GOVERNMENTAL AFFAIRS COMMITTEE
HEARING ON CAMPAIGN FUNDRAISING
WITNESSES:
CLARKE WALLACE, WHITE HOUSE COFFEE ATTENDEE
BETH DOZORETZ, DNC MANAGING TRUSTEE
RAWLEIN SOBERANO, ASIAN-AMERICAN BUSINESS ROUNDTABLE
CHAIRED BY:
SEN. FRED THOMPSON (R-TN)
216 HART SENATE OFFICE BLDG.
AFTERNOON SESSION

BODY:
... doing since.
MR. MADIGAN: Were you involved in the founding of an organization known as the Asian-American Business Roundtable, known as **AABR?**
MR. SOBERANO: Yes, sir. In 1989, we founded the Asian-American Business Roundtable in order to help Asian- ...

... Now, let's move to later that summer in 1996. Were you involved in trying to line up sponsors for the annual **AABR** dinner that would be held later that year?
MR. SOBERANO: Yes, sir. I was in the process of trying to identify people who could ...

... in that particular instance we were located in Fairfax, Virginia.
MR. MADIGAN: So, was Mr. Huang asking you questions about the **AABR?**
MR. SOBERANO: Mmm-hmm. (Affirmative.)
MR. MADIGAN: And you were answering them?
MR. SOBERANO: Yes, sir. And I told him about the ...

8TH STORY of Level 1 printed in KWIC format.

FDCH Political Transcripts

September 16, 1997, Tuesday

TYPE: COMMITTEE HEARING

LENGTH: 45602 words

HEADLINE: HOLDS DAY 18 OF HEARINGS ON INVESTIGATIONS INTO FUNDRAISING ACTIVITIES DURING THE 1996 ELECTIONS; WASHINGTON, D.C.

COMMITTEE: SENATE GOVERNMENTAL AFFAIRS COMMITTEE

BODY:
... I have been doing since.

MADIGAN: Were you involved in the founding of an organization known as the Asian American Business Roundtable, known as **AABR?**

SOBERANO: Yes, sir. In 1989, we founded the Asian American Roundtable in order to help Asian American businesses, ...

... Now, lets move to later that summer in 1996. Were you involved in trying to line up sponsors for the annual **AABR** dinner that would be held later that year?

SOBERANO: Yes, sir. I was in the process of trying to identify people who could help ...

... I mean, that particular instance we were located in Fairfax, Virginia.

MADIGAN: So is Mr. Huang asking you questions about the **AABR?**

SOBERANO: Yes.

MADIGAN: And you were answering them.

SOBERANO: Yes, sir. And I told him about the organization. And I remembered that it was during the ...

NOTES:
???? - Indicates Speaker Unkown
- Could not make out what was being said.
off mike - Indicates Could not make out what was being said.

10TH STORY of Level 1 printed in FULL format.

Newsday

July 7, 1997, Monday, QUEENS EDITION

SECTION: NEWS; Page A22

LENGTH: 245 words

HEADLINE: NEWSDAY / QUEENS PROFILE / KATHRYN FLOOD

BYLINE: By Sheila McKenna

BODY:
JOB Director of quality assurance for the Association for the Advancement of Blind and Retarded Inc. in Middle Village; member of the Mental Retardation Council of Queens; recognized by the NYS Office of Mental Retardation / Developmental Disabilities for getting **AABR** involved in COMPASS (Consumer Output Management Plan Agency Self Survey). BIOGRAPHY Born and reared in Inwood; graduated from Johnson C. Smith University; was a teacher for United Cerebral Palsy; single parent of a 13-year-old son. RESIDENCE Home in Van Cortland Village, Bronx. IMPACT "I am committed to quality care, as well as everyone's right to develop and live a meaningful life . . . My approach is to get initial impressions, to see what the general feeling of each program is, and to come up with what is best for each individual person. I have a lot of energy, and I think it's that energy that the staff picks up on." FOCUS "Ensuring that our programs maintain high standards of care . . . My role is to make sure that our guys are receiving the best possible services and that our staff has the opportunity to identify . . . consumer likes and dislikes." CONCERN "How the community accepts individuals with disabilities. There's still a lot of work to be done and a lot of prejudice to overcome . . . We're all in this world together, and although people with disabilities might require a little more attention or help, they still deserve our tolerance and respect."

GRAPHIC: Newsday Photo by Michael E. Ach-Kathryn Flood

LANGUAGE: English

LOAD-DATE: July 7, 1997

12TH STORY of Level 1 printed in FULL format.

Newsday

March 7, 1997, Friday, QUEENS EDITION

SECTION: NEWS; Page A30

LENGTH: 248 words

HEADLINE: QUEENS PROFILE / FRANCES STILLMAN

BYLINE: By Sheila McKenna

BODY:
JOB Director of public relations for the Association for the Advancement of the Blind and Retarded Inc. in Jamaica for the past 23 years; later this month, the organization will be recognizing her years of dedication and service by naming a residence for autistic teenagers in her honor. BIOGRAPHY 88; born in Russia, emigrated to Brooklyn with her family when she was 4 years old; worked as an accountant before marrying; widow, one daughter, now deceased. RESIDENCE Home in Bayside. IMPACT My job is fund raising. I believe that a heart filled with love always has something to give and the whole worth of a benevolent deed lies in the love that inspires it. I do everything I can to encourage people to support **AABR**. After the verb "to love," "to help" is the most beautiful verb in the world.' WHY SHE'S INVOLVED After my husband died 23 years ago, I wanted to devote my time to helping blind people because my mother was blind. One day I saw an ad for the **AABR** and, since that day, it has been my life. My only daughter died, and these children are my children. In every person there is something precious that is in no other.' CURRENT FOCUS At **AABR's** St. Pascal's School in St. Albans, we have a thrift shop in the school. It offers training to blind and retarded adults on how to work in and to run a store. My job is to raise money for it, and I've sent letters all over the world to encourage people to support it and other things sponsored by the **AABR**.'

GRAPHIC: Newsday Photo by Vincent Pugliese- Frances Stillman

LANGUAGE: English

LOAD-DATE: March 7, 1997

14TH STORY of Level 1 printed in FULL format.

Agence France Presse

October 20, 1994 14:31 Eastern Time

SECTION: International news

LENGTH: 187 words

HEADLINE: Ancient tombs found in Egypt

DATELINE: CAIRO, Oct 20

BODY:
Archaeologists have discovered three tombs from the time of the Pharaohs dating back to about 2300 B.C. beneath debris left behind by other excavations, the daily Al-Ahram al-Massai said Thursday.

The discovery was made in May and June by an Egyptian-Australian team, who say the walls of the tombs are covered with drawings and inscriptions.

"The drawings have kept their superb colours with turquoise for the walls and red for false doors," one of the archaeologists said.

One of the tombs is of particular historic significance because it belonged to Ka **Aabr**, who was in charge of the Pharoahs' farms, but unknown by Egyptologists before the find.

His tomb will provide a key to the political, social and religious life of an epoch about which little was known.

lr/jkb/dw

AFP

LANGUAGE: ENGLISH

LOAD-DATE: October 20, 1994

15TH STORY of Level 1 printed in FULL format.

The Times

April 29, 1993, Thursday

SECTION: Features

LENGTH: 684 words

HEADLINE: Horsepower puts the show on the road

BODY:

Great advances have been made in transport arrangements A good driver holds the key to the horse's comfort

When David Broome started showjumping in the 1950s he transported his horses in a ''cattle wagon''. It was a basic wooden truck with no adornments. If he had to stay at a show overnight he would put in some fresh straw and ''bed down'' with a couple of blankets and a Primus stove. ''With hindsight it was so dangerous it wasn't true,'' Mr Broome says.

Now, like many of his fellow competitors, he has a state-of-the-art luxury horsebox complete with padded and insulated quarters for the horses and a fully equipped living area for the grooms, Jenny MacArthur writes. It has central heating, a fridge, cooker, shower and sleeping quarters.

His is by no means the most luxurious. AK International in Dorset recently built a ''special vehicle'' for the Almox showjumping team in Germany which includes a whirlpool bath in the living area. Oakley Horseboxes has just finished working on a six-horsebox which cost Pounds 250,000. It sleeps six, has air-conditioning, air-suspension and all ''mod cons'' including a kitchen which has ''everything you have at home except a dishwasher''.

Until the 1950s, most horses travelling long distances overland went by train. As late as the 1960s trains still ran from the Olympia railyard in London taking horses from the Royal International Horse Show up to Holyhead for the Dublin show.

As travel by train decreased air travel became popular. Peden International Transport now flies horses to race in France and back again on the same day.

The stress suffered by horses when travelling varies. Michael Bullen, Peden's managing director, whose firm handled the transporting of horses to the Olympic Games in Montreal, Los Angeles and Seoul, recalls horse flights of 45 hours to Australia. ''Most horses travel well but there is always the possibility

that they may get travel sickness.''

When travelling by road, Mr Broome generally keeps to the rule not to jump horses the same day if they have had a journey of two hours or more. ''The stress goes up noticeably after ten hours travelling,'' he says. Eric Ellis, the

Welfare Officer of the British Horse Society, recommends a maximum journey of 12 hours, with a stop after six hours to feed and water. Horseboxes with air suspension tend to ''smooth out'' the ride and considerably reduce travel stress.

For shorter journeys, horses can be safely and comfortably transported by trailer, which attaches to the back of a car, or by small horsebox.

About 5,000 new trailers are sold in Britain each year. John Hicks, who runs a family business at Malmesbury, in Wiltshire, says that a ''good second hand trailer with front and rear unloading and in

reasonable condition can

be bought

for around Pounds 1,500''. At the other end of the trailer market, Rice has launched its latest Elite model, made entirely of fibreglass and costing Pounds 6,000. However, second-hand horseboxes (not in the luxury class) sell for between Pounds 8,000 and Pounds 9,000. An old box does not necessarily mean more problems.

Jonathan Marson of the Organisation of Horsebox and Trailer Owners, which has dealt with 15,000 breakdowns through its **AABRS** Fleet Service since 1985, says: ''We find the older horseboxes often have the least problems. People seem to think that the modern luxury boxes can't go wrong so they don't have them checked as often as they should. The older the box the better it seems to be looked after.''

''Moving horses about is like transporting egg shells,'' Graham McKee, of Oakley Horseboxes, says. A good driver holds the key to the horse's comfort and no amount of ''luxury'' fittings can compensate for a bad driver. If a horse refuses to load it can usually be traced back to an unhappy travelling experience, such as being ''swung'' round corners or being unbalanced by sudden breaking. When Mr Broome gets a new driver, he gives this advice: ''Imagine you've got a glass of water beside you while you're driving you don't want to be spilling any.''

LANGUAGE: ENGLISH

LOAD-DATE: April 30, 1993

16TH STORY of Level 1 printed in FULL format.

Newsday

June 2, 1992, Tuesday, QUEENS EDITION

SECTION: NEWS; Pg. 25

LENGTH: 274 words

HEADLINE: QUEENS NEIGHBORHOODS

BODY:

FLUSHING / Spring Bazaar

To Benefit Rehab Center

Aurora Concept, a nonprofit rehabilitation center for drug and alcohol abuse and emotional problems, plans a spring festival bazaar Saturday and Sunday.

The bazaar will be held both days from 10 a.m. to 6 p.m. at 78-39 Parsons Blvd., Flushing. Toys, gifts, clothes and food items from around the world will be on sale. Proceeds will benefit Aurora's programs. LEFRAK CITY / Rally Sets

Sights on Drugs, Violence

A Stop the Violence / Stop the Drugs Rally will be held Saturday from 10 a.m. to 1 p.m. on 57th Avenue from 98th Street to 97th Place.

Speakers will include Assemb. Jeffrion Aubry, Council members Helen Marshall and John Sabini, Officers Correct program coordinator Russell Barnwell, and Lefrak City Tenants Association President Governor Hendley.

The rally is sponsored by the Lefrak City Youth and Adult Activities Association and the Officers Correct Program. For more information, call Albert Blake at 457-3615.

FLUSHING / Nine Groups

To Split $ 45,500 Grant

The Rotary Club of Flushing plans a special grant presentation Thursday at which proceeds of $ 45,500 from the "Kurt for Kids" dinner dance and souvenir journal will be presented to nine community organizations.

The dinner dance honored Kurt Weishaupt as the club's Man of the Year for 1991.

Recipients are the Queens Child Guidance Center, ANIBIC, My Mother's House, St. Mary's Hospital for Children, WORC, Styepping Stone School, Outreach

17TH STORY of Level 1 printed in FULL format.

Newsday

January 28, 1988, Thursday, QUEENS EDITION

SECTION: NEWS; QUEENS NEIGHBORHOODS; Pg. 33

LENGTH: 263 words

HEADLINE: QUEENS PROFILE;
Martha Gruber Rosen

BYLINE: Compiled by Shiela McKenna

BODY:

JOB

Founder and active member of the Association for the Advancement of Blind and Retarded Inc., based in Jamaica; started the organization in 1956 to help her daughter, who was born blind and retarded, and to aid other children; association operates 10 homes in all boroughs but Brooklyn and two day treatment programs in Queens.

BIOGRAPHY

Born in Manhattan, reared in Brooklyn; was executive director of **AABR** from 1956 until 1984; married, one daughter.

RESIDENCE

Apartment in midtown Manhattan.

BIGGEST ACCOMPLISHMENT'In helping my daughter, we have helped many more young people. We were pioneers, and we demonstrated that we were ahead of our time. When people were saying send your children to Willowbrook, we didn't take that suggestion, we felt they were people with capabilities and that they belonged in the community . . . we had to wait ten years until the professionals came around to that point of view.'

CONCERNS

'That with the new generation, young parents will still keep their rightful place as advocates for the handicapped to make sure that things go on the way they should.'

REWARDS

'My daughter is very happy, she's living appropriately with her peer group and she's made a good adjustment. If you multiply that by 290 people in a similar situation, it's a good feeling.

CURRENT FOCUS

'We have evolved into an organization that is citywide. We have day treatment programs for people over the age of 18 who are living with their parents until we are able to build more facilities.'

GRAPHIC: Photo by Jon Naso-Martha Gruber Rosen

LANGUAGE: ENGLISH

18TH STORY of Level 1 printed in FULL format.

Engineering and Mining Journal

June 1985

SECTION: FEATURED THIS MONTH; E & MJ Equipment Update; Pg. 60

LENGTH: 2299 words

HEADLINE: IMPROVE GRINDING CONTROL

BYLINE: John R. Burger, senior editor

HIGHLIGHT:
ON-STREAM PARTICLE SIZE ANALYZERS CAN HELP IMPROVE GRINDING MILL THROUGHPUT

BODY:
The on-stream particle size analyzer is an instrument with many potential uses. Far and away the most common practice in mineral beneficiation is to use it to monitor grinding mill discharge after the pulp has passed through a classifying cyclone. The instrument samples and analyzes the cyclone overflow.

The resulting signal can be used to automatically adjust grinding variables or the data readout can be used to guide manual changes. According to a paper by R.E. Hathaway, n1 "benefits from size-based control range from 3 1/2% to 20% increase in [grinding mill] throughput, and significant recovery improvements are also to be expected because of up to 5% finer grinds at same or greater throughput."

Three manufacturers that supply on-stream particle size analyzers to the mining industry are Armco Autometrics, Leeds & Northrup Instruments, and Heath & Sherwood (1964) Ltd.

ARMCO AUTOMETRICS DOMINATES

In terms of numbers of instruments installed in mills, Armco Autometrics leads the other companies. Armco Grinding Systems, a unit of Armco, claims to supply about 35% of the Free World's grinding media. As an adjunct to its sales effort, the company also provides technical expertise to the industry, including periodic grinding symposia, the most recent of which was in Chile in November 1984. Armco became interested in the PSM particle size monitor developed by Autometrics. Armco acquired Autometrics in 1978, and further developed the product, adding improved versions.

Autometrics had developed the PSM-200 which could monitor finer sizes and had a demagnetizer permitting measurement of magnetic materials, but Armco developed the PSM-300 that followed that contained a redesigned air removal system. The most recent, current model, the PSM-400, uses digital rather than the analog electronics of its predecessors, and is easier to install and calibrate.

PSM/400 OPERATION

The PSM-400 draws a sample flow stream from the process flow stream at a rate of 15-25 gal/min, into an air eliminator. Air bubbles must be removed from the sample, because they will register as particles. The air eliminator removes the entrained air using a combination of centrifugal force and reduced air pressure. The sample flowstream enters the top of a rotating impeller with an elliptical cross section and exits through the lower part, entering an outer tank. An externally mounted waterpowered aspirator reduces the pressure inside the impeller to about 4 lb/in.<2>

The sample flow stream passes through the sensor, where the particle size and percent solids are measured, and then returns to the main process flowstream. The actual measurement in the sensor section is done with two pairs of piezoelectric crystal transducers that transmit ultrasonic energy through the slurry from one transducer to its matched receiver. The two sets of transducers are spaced differently and operate at different frequencies. One set uses the signal attenuation to determine particle size, the other to measure the percent solids. The ultrasonic energy is transmitted into the slurry at the rate of about 500 pulses/sec. Coarser particles and higher density slurries absorb more energy.

The electric signals from the sensors are processed and the data are computed. The PSM is factory-calibrated to detect a pre-determined size, a size selected by the user before the instrument is manufactured. This size has a 20-30% band width, within the PSM-400's operating range of 28-500 mesh. Size data is displayed on an LCD on a hand-held terminal in terms of percent retained or percent passing the selected screen size. The percent solids information is displayed as either percent solids by volume or, given the specific gravity of the solids, as percent solids by weight. Data output is continuous. Although the desired particle size is selected before manufacturing, small range adjustments can be made later and accuracy can be routinely checked and corrections made. The instrument is calibrated in the mill. The price of the instrument is about $55,000.

Armco believes that the best use of the PSM-400 is as the primary input of an automatic control system. An example of this can be drawn from R.D. Deister's paper, "Buick Concentrator Process Control Development," presented at the SME-AIME Annual Meeting in New York, February, 1985.<2> At the Buick concentrator, a lead and zinc producer in Missouri processing over 7,700 st/d, "the particle size control loop compares the percentage of particles passing 200 mesh in the cyclone overflow product as measured by the Particle Size Analyzer, to an operator entered setpoint. The output from the particle size control loop varies the water addition to the cyclone feed sump effectively altering the cyclone split characteristics to maintain the desired overflow particle size. While the primary purpose of the particle size control loop is to control [the cyclone] overflow particle size, it also has a significant effect on ball mill loading, sump level, grinding circuit throughput and constant flotation feed volume. Therefore, proper tuning of the particle size control loop is essential."

A study at the Southern Peru Copper Company's Cuajone mill,<3> which treats a nominal 45,000 st/d of porphyry copper ore, provided some interesting results. Their tests showed that "a mill being controlled by a PSM will produce at least 5% more tonnage than a mill operating without on-stream size control" and that "without size control, the flotation feed size varies between 6% and 10% plus 65

mesh when the target is 8% plus 65 mesh. With size control, the variation ranges between 7.5 and 8.5% plus 65 mesh for the same size setpoint."

The test showed that because of the increased throughput, the nominal design capacity of an expansion planned for Cuajone could be increased from 65,000 st/d to 70,000 st/d with only a small increase in capital expenditure. Also, "by maintaining a tight size range and preventing over and under grinding, a somewhat coarser grind should not effect flotation efficiency and therefore the second result should contribute to post-expansion tonnage rates exceeding the nominal design."

The foregoing examples from the Buick and Cuajone mills show how a particle size analyzer can be used in an automatic control loop, and the Cuajone case quantifies throughput improvement. The instruments used in these cases were either the Autometrics device or the Armco Autometrics successor instrumentation. It is reasonable to suppose that other manufacturers' instrumentation may offer similar benefits and that the prudent mill manager contemplating a purchase will want to consider what the competition has to offer.

LEEDS & NORTHRUP'S MICROTRAC

At the moment, the principal competitor appears to be the Microtrac,<4> produced by Leeds & Northrup Instruments, a unit of General Signal. L&N developed an instrument in the 1970s that works on a light scattering principal -- Fraunhofer defraction patterns -- and uses a helium-neon laser (discharge tube type) as a light source. A sample is periodically drawn from the process line by a pneumatic sampler. It is debubbled, mixed with clean water, and continuously circulated through the sample cell until the particle size data have been collected and computed. The sample cell is then drained, rinsed, and refilled for the next measurement. A demagnetizing coil operating at about 400 Hz facilitates handling of magnetic materials. Minimum measuring time is 25 sec, but the full cycle takes from 2 to 6 min, with larger material requiring the longer running time.

The Microtrac is available in two measurement ranges -- 1.9 to 176 m um, and 3.3 to 300 mu m. The results are presented as the volume of particles in each of 13 channels. The channels widen progressively by a ratio of the square root of two. Cumulative and histogram data (see illustration) are also provided as are summary data that include:

* the value in microns of the 10th, 50th, and 90th percentile points;

* the mean diameter (in microns) of the volume distribution;

* the calculated mean specific surface area in m<2>/cm<3>;

* a dimensionless number representing the total physical quantity of sample present during the analysis.

These data can be printed out, displayed, or transmitted in either analog or digital form.

Several sample streams can be monitored, with four being the standard. The

instrument costs about $45,000.

The Microtrac does not have as much in-plant experience in the minerals business as Armco's PSM but it is in service at Mt. Isa mines in Australia, taconite mills in Minnesota, and in concentrators located in Brazil, Mexico, and other places. A factory-calibrated Microtrac is also available in a model that analyzes dry materials instead of slurry.

HEALTH & SHERWOO'S NEW ENTRY

A new device on the market, available commercially this year for the first time, is the PSA on-stream particle size analyzer developed by the Noranda Research Centre. n5 This analyzer has been licensed to Heath & Sherwood (1964) Ltd., for manufacture and marketingThe instrument's design and operation apply Stokes' law, a well-known sedimentation principal, to determine particle size and uses relatively simple hardware.

The measurement is based on the difference in density between two balanced columns of water when a pulp sample is introduced into one of the columns, then measuring the change in density difference as the sample settles. Pressure sensors are located at the bottom of each column and the differential pressure resulting from the density differences is measured by a transducer.

The automatic filling, sampling, measuring, flushing, and data processing cycle takes 6 min and the reading interval is 10 min. The results are based on a 0.5 liter sample. The instrument operates in such a way that the percent passing any given size is obtained without having to wait for complete settling.

The current PSA has a direct reading display of the weight percent finer than any two mesh sizes. Output signals are available for recording and as computer inputs.

Extensive field testing at Brunswick Mining and Smelting and Matagami Mines have demonstrated that the intermittent nature of the signals is of no consequence for grind circuit control. Setting the instrument to report the weight percent finer than any two mesh sizes chosen for control proved to be adequate for control purposes. Instrument calibration is easily done by a screening check on individual samples available at any time from the instrument sampling system. Instrument accuracy is compara- ble to hand screening, which meets process control requirements.

The operation of the PSA is plainly visible, an asset for the operator. The manufacturer claims that maintenance requirements for this rugged, simple instrument have been minimal to nonexistent. The PSA will be on the market in 1985 at a price under $30,000.

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n4) Muly, E.C. and Fock, H.N., "Industrial Particle Size Measurement Using Light Scattering," Optical Engineering, November/December 1980,vol. 19, no.6 p 861. 5) Rosenblum, F. et al, "A New On-Stream Particle Size Analyzer for Slurries," in Control '84. Mineral/Metallurgical Processing, ed By Herbst, John A., AIME-SMEE/MS, p 15. '

On-stream particle size analyzers

	Instrument	Sampling interval	Detection method
Armco Autometrics 7077 Winchester Circle Boulder, Colo. 80301 Telephone: 303-530-1600 Telex: 294973 **AABR** UR (and through Armco offices worldwide)	PSM-400	continuous	ultrasonic
Leeds & Northrop Instruments Sumneytown Pike North Wales, Pa. 19454 Telephone: 215-643-2000 Telex: 846192 (and offices in Johannesburg, Sydney, and Dusseldorf)	Microtrac	2-6 min	laser
Heath & Sherwood (1964) Ltd. 187 Steelcase Road West, Unit 4 Markham, Ont. Canada L3R 2R9 Telephone: 416-475-5236 Telex: 06-986314	PSA	10 min	sedimentation

	Detection range	Data type
Armco Autometrics 7077 Winchester Circle Boulder, Colo. 80301 Telephone: 303-530-1600 Telex: 294973 **AABR** UR (and through Armco offices worldwide)	selected size within 28-500 mesh	% passing or retained % solids
Leeds & Northrop Instruments Sumneytown Pike North Wales, Pa. 19454 Telephone: 215-643-2000 Telex: 846192 (and offices in Johannesburg, Sydney, and Dusseldorf)	1.9-176 microns or 3.3-300 microns	13 size channels cumulative, histogram, and summary data
Heath & Sherwood (1964) Ltd. 187 Steelcase Road West, Unit 4 Markham, Ont. Canada L3R 2R9 Telephone: 416-475-5236 Telex: 06-986314	200-600 mesh	wt/% finer than two mesh sizes

	Shipping weight	Price

Armco Autometrics 7077 Winchester Circle Boulder, Colo. 80301 Telephone: 303-530-1600 Telex: 294973 **AABR** UR (and through Armco offices worldwide)	1,400 lb	$55,000
Leeds & Northrop Instruments Sumneytown Pike North Wales, Pa. 19454 Telephone: 215-643-2000 Telex: 846192 (and offices in Johannesburg, Sydney, and Dusseldorf)	800 lb	$45,000
Heath & Sherwood (1964) Ltd. 187 Steelcase Road West, Unit 4 Markham, Ont. Canada L3R 2R9 Telephone: 416-475-5236 Telex: 06-986314	400 lb	under $30,000

GRAPHIC: Illustration, Net Revenues Based on Recovery/Throughout Relationships, Source: Armco Autometrics; Picture 1, The PSM-400 produces continuous size and density readings.; Picture 2, Microtrac gives discontinuous readings for 13 sizes.; Illustration 2, This is a typical printout from a Leeds & Northrup Microtrac.; Illustration 3, Health & Sherwood (1964) Ltd. particle size analyzer

LANGUAGE: ENGLISH

19TH STORY of Level 1 printed in FULL format.

Financial Times (London)

February 16, 1983, Wednesday

SECTION: SECTION II; International Companies; UK Company News; Appointments; Pg. 21

LENGTH: 77 words

BODY:

Under the re-organisation of the membership services division BRITISH ROAD SERVICES, a new financial post has been created. Mr Ray Combs has been appointed head of finance, responsible for the financial administration of all services offered by the division including the communications centre, **AABRS** Rescue, BRS Transcard, and Prestel Datafreight. He was management accountant with Cotrali-Pickfords, a sister company in the National Freight Consortium.

LANGUAGE: ENGLISH

LEVEL 1 - 3 OF 19 STORIES

WORLDWIDE BIOTECH

May, 1998

SECTION: No. 5, Vol. 10

LENGTH: 634 words

HEADLINE: BELGIAN MED PROGRAM INTEGRATES NEWBORN HEARING SCREENING

BODY:

Kind en Gezin (Child and Family), a government agency located in Flanders, the northern region of Belgium, has announced the successful integration of universal newborn hearing screening into its established preventative pediatric healthcare program.

As part of the existing program, a district nurse visits all new mothers three to four times in the first few weeks following the birth of a baby. These visits help to educate and provide support to new parents. In addition, nurses conduct a complete assessment of each newborn's health, which will now include screening for hearing impairment.

Following extensive review and evaluation, the agency selected Automated Auditory Brainstem Response (AABR(tm)) technology, unique to Natus Medical Inc.'s ALGO(tm) Newborn Hearing Screener. In order to meet the goals set forth by Kind en Gezin, it was necessary for the equipment to be easy to use, highly accurate and cost-effective. At the conclusion of an intensive six-month pilot project, Natus' ALGO screener was selected to perform universal newborn hearing screening in Flanders. Flanders has an annual birth rate of 66,000. The ALGO screener is the only device that uses patented AABR(tm) (Automated Auditory Brainstem Response) technology that screens the complete hearing pathway from the ear to the brainstem, offering the highest level of accuracy available.

Study results reported by Christine Yoshinaga-Itano, Ph.D., Chair, Department of Speech, Language and Hearing Services at the University of Colorado, Boulder, show that proper follow-up and intervention make a remarkable difference in the language ability of children born with hearing loss. Children identified at birth as hearing impaired will have the opportunity to develop a normal range of language comprehension, verbal expression, and psycho-social development. In contrast, children who are identified at six months of age or older are likely to experience significant and irrecoverable delays in both language and psycho-social development.

"Natus Medical's ALGO(tm) Newborn Hearing Screener has proven ideal for the specified requirements encountered during the trial period and since its general implementation. The equipment is simple, effective, and produces immediate, objective results," stated Erwin van Kerschaver, MD, scientific advisor, Kind en Gezin. "The ALGO screener has been well received by the Belgian medical community and has enabled nursing staff without specific audiological backgrounds to perform hearing screening in a variety of settings, including home visits."

The four-month trial period has already proven to be effective with the identification of a hearing impaired child at three weeks of age. "We are extremely happy with the success we are already seeing in just a short period of
time," said Luc Stappaerts, district nurse.

"Hearing impairment is a global issue. We are especially pleased that newborn hearing screening is gaining the international attention it deserves. That the Belgian medical community has successfully integrated the ALGO screener into its preventative healthcare program is an admirable step in the right direction," said William New, Jr., MD, PhD, Chairman and CEO, Natus Medical Inc. "We hope other countries will follow Belgium's lead and make newborn hearing screening a priority."

The ALGO(tm) Newborn Hearing Screener is a product of Natus Medical Inc., a leading provider of newborn screening products, based in San Carlos, California. The company's principal line of business is in designing, manufacturing, and marketing Automated Auditory Brainstem Response (AABR(tm)) screening technology, a non-invasive, cost-effective, and reliable method to quickly screen newborns for hearing impairment.

For more information, call 650/802-0400.

LANGUAGE: ENGLISH

LOAD-DATE: April 30, 1998

LEVEL 1 - 4 OF 19 STORIES

Business Wire

March 30, 1998, Monday

DISTRIBUTION: Business Editors/Health & Medical Writers

LENGTH: 741 words

HEADLINE: Belgian Agency Integrates Newborn Hearing Screening Into Preventative Health Care Program With Great Success

DATELINE: SAN DIEGO

BODY:

-March 30, 1998--Kind en Gezin (Child and Family), a government agency located in Flanders, the northern region of Belgium, has announced the successful integration of universal newborn hearing screening into its established preventative pediatric healthcare program. As part of the existing program, a district nurse visits all new mothers three to four times in the first few weeks following the birth of a baby. These visits help to educate and provide support to new parents. In addition, nurses conduct a complete assessment of each newborn's health, which will now include screening for hearing impairment. Following extensive review and evaluation, the agency selected Automated Auditory Brainstem Response (AABR(tm)) technology, unique to Natus Medical Inc.'s ALGO(tm) Newborn Hearing Screener. In order to meet the goals set forth by Kind en Gezin, it was necessary for the equipment to be easy to use, highly accurate and cost-effective. At the conclusion of an intensive six-month pilot project, Natus' ALGO screener was selected to perform universal newborn hearing screening in Flanders. Flanders has an annual birth rate of 66,000. The ALGO screener is the only device that uses patented AABR(tm) (Automated Auditory Brainstem Response) technology that screens the complete hearing pathway from the ear to the brainstem, offering the highest level of accuracy available. Study results reported by Christine Yoshinaga-Itano, Ph.D., Chair, Department of Speech, Language and Hearing Services at the University of Colorado, Boulder, show that proper follow-up and intervention make a remarkable difference in the language ability of children born with hearing loss. Children identified at birth as hearing impaired will have the opportunity to develop a normal range of language comprehension, verbal expression, and psycho-social development. In contrast, children who are identified at six months of age or older are likely to experience significant and irrecoverable delays in both language and psycho-social development. "Natus Medical's ALGO(tm) Newborn Hearing Screener has proven ideal for the specified requirements encountered during the trial period and since its general implementation. The equipment is simple, effective, and produces immediate, objective results," stated Erwin van Kerschaver, MD, scientific advisor, Kind en Gezin. "The ALGO screener has been well received by the Belgian medical community and has enabled nursing staff without specific audiological backgrounds to perform hearing screening in a variety of settings, including home visits." The four-month trial period has already proven to be effective with the identification of a hearing impaired child at three weeks of age. "We are extremely happy with the success we are already seeing in just a short

period of time," said Luc Stappaerts, district nurse. "Hearing impairment is a global issue. We are especially pleased that newborn hearing screening is gaining the international attention it deserves. That the Belgian medical community has successfully integrated the ALGO screener into its preventative healthcare program is an admirable step in the right direction," said William New, Jr., MD, PhD, Chairman and CEO, Natus Medical Inc. "We hope other countries will follow Belgium's lead and make newborn hearing screening a priority." The ALGO(tm) Newborn Hearing Screener is a product of Natus Medical Inc., a leading provider of newborn screening products, based in San Carlos, California. The company's principal line of business is in designing, manufacturing, and marketing Automated Auditory Brainstem Response (AABR(tm)) screening technology, a non-invasive, cost-effective, and reliable method to quickly screen newborns for hearing impairment.

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Today's News On The Net - Business Wire's full file on the Internet

with Hyperlinks to your home page.

URL: http://www.businesswire.com

LANGUAGE: ENGLISH

LOAD-DATE: March 31, 1998

LEVEL 1 - 6 OF 19 STORIES

Wyoming Tribune-Eagle

December 03, 1997, Wednesday

SECTION: Local; Pg. A5

LENGTH: 366 words

HEADLINE: WYOMING LEADS IN NEWBORN SCREENING

BYLINE: Deidre Forster Wyoming Tribune-Eagle

BODY:
CHEYENNE -- Wyoming is the first state to screen every newborn's hearing capabilities.

Every hospital in the state is equipped with an Automatic Auditory Brainstem Response machine, said Nancy Pajak, an audiology consultant for the state.

The AABR looks at brain wave activity in response to sound, she said.

The tests are non-intrusive and take 5-6 minutes. Earphones are placed over the infant's ears and sensors are placed on their heads and shoulders.

The sensors record the amount of brain activity in response to the sound played through the headphones.

"We never say right away that this child has a hearing loss," Pajak said.

If concerns about the level of activity come up, the test is immediately repeated. If those results aren't favorable, the test is administered about one week later, Pajak said. If concerns still exist, a referral for more diagnostic evaluation is made.

'We have had a very, very low refer rate," she said. "Only about 1 percent are sent on to have a diagnostic done."

The state began the screenings with a pilot program at United Medical Center, Pajak said.

Since then, thanks to funding from the state Division of Developmental Disabilities, every hospital in the state has purchased the equipment.

The cost of the AABR screening is kept to a minimum, she said. The screening costs between $30-$40. Parents can choose to not have their child screened.

Every month since July, the state's hospitals have administered the screenings to at least 90 percent of Wyoming newborns, Pajak said. Last month 97 percent were tested.

"It has literally required the cooperation of hundreds of people across the

state," she said. "I have never seen a group of people work so well on a project."

The screenings are important for a variety of reasons, Pajak said.

Statistics from the March of Dimes show one out of every 200 children is born with a hearing loss. The screenings can identify those children, she said.

"It helps families. They don't go through the frustrations of wondering what's going on," Pajak said.

Early identification of hearing loss can make it easier for children to learn language skills, as well, she said.

LANGUAGE: English

LOAD-DATE: December 3, 1997

LEVEL 1 - 9 OF 19 STORIES

Business Wire

August 18, 1997, Monday

DISTRIBUTION: Health Editors/Medical Writers

LENGTH: 786 words

HEADLINE: Women & Infants Hospital In Rhode Island Adds ALGO Newborn Hearing Screener To Program With Outstanding Results

DATELINE: SAN CARLOS, Calif.

BODY:
8, 1997--Women & Infants Hospital (Women & Infants) located in Providence, R.I. and a pioneer in investigative research into the benefits of newborn hearing screening and intervention, has purchased Natus Medical Inc.'s (Natus) 1,000th ALGO Newborn Hearing Screener instrument as it continues to integrate the ALGO's Automated Auditory Brainstem Response (AABR) technology into its established program.

"We have achieved improved hearing screen efficiency in our hearing assessment program since we began using AABR technology," stated Dr. Betty Vohr, medical director for the Rhode Island Hearing Assessment Program. "This improved efficiency has resulted in a lower rescreen rate, less stress on our patients' families, improved acceptance by pediatricians and more immediacy in the referral process for further audiologic testing and early intervention."

Women & Infants purchased its first ALGO unit in January. Data collected in the first six months of integrating the ALGO into its screening program with otoacoustic emissions, verify a 40 percent decrease, from five percent to three percent, in the Women & Infants' refer rate. The incorporation of the ALGO into Women & Infants' screening program as a second stage screen has significantly mitigated the number of refers previously occurring in the screening process, which translates into financial savings through reductions in the occurrence of unnecessary rescreens and audiologic testing, and an emotional savings for parents worried about their baby's hearing status.

Rhode Island is one of 17 states collaborating in the Marion Downs Center for Infant Hearing's four year federal Maternal and Child Health Services Grant to create early intervention systems for children born deaf or with hearing impairment, including protocols for screening and follow-up services. The state was also the first in the nation to mandate and achieve universal hearing screening for newborns. "Hearing is the most critical factor in a child's early communicative development," said Dr. James F. Padbury, Women & Infants' chief of Pediatrics. "Newborn hearing screening is the standard of care in Rhode Island."

Currently, only 10 percent of infants born in the United States are screened for hearing loss. Directors at the Marion Downs Center, which is located in Colorado, estimate that 40 percent of infants who are born deaf or hearing

impaired do not receive proper diagnostic follow up. Study results reported by Christine Yoshinaga-Itano, Ph.D., chairwoman, Department of Speech, Language and Hearing Services at the University of Colorado, Boulder, show that with proper follow-up and intervention, the difference between a child detected at birth and a child detected laren identified at birth have a greater opportunity to develop a normal range of language comprehension and expression, as wellsycho-social development, regardless of the severity of their hearing loss. In contrast, children who are born deaf or hard ognificant delays in both language and psycho-social development. "Women & Infants' improved efficiency facilities prompt diCary, MS,CCC-A, Audiology Coordinator with Rhode Island's Hearing Assessment Program.

Nationally, three to six of everyhe National Institute on Deafness and Other Communication Disorders (NIDCD) estimates that hearing, speech and language diso lost productivity. Early detection and intervention can potentially save as much as 25 percent of this annual expenditure,ory Brainstem Response (AABR) technology, an accurate, objective and cost-effective method for screening newborns for hearin pathway, from the ear to the brainstem, through sensors placed on a baby's head, and records the brain wave responses to sonfants, the largest women's hospital in the state of Rhode Island, integrate the ALGO into its newborn hearing screening pro pioneer in the national effort to ensure that universal newborn hearing screening is the standard of care."

The ALGO Nding provider of newborn screening products. The company's principal line of business is in designing, manufacturing and mat-effective and reliable method to quickly screen newborns for hearing impairment.

Women & Infants is southeastern New teaching affiliate in obstetrics, gynecology and newborn pediatrics for the Brown University School of Medicine, and is the pon request.

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LANGUAGE: ENGLISH

LOAD-DATE: August 19, 1997

LEVEL 1 - 11 OF 19 STORIES

The Virginian-Pilot (Norfolk, VA)

May 7, 1997, Wednesday, FINAL EDITION

SECTION: LOCAL, Pg. B1

LENGTH: 1005 words

HEADLINE: EVMS RESEARCHERS SEEK MANDATORY HEARING TESTS FOR ALL VA. NEWBORNS; NEW TECHNOLOGY MAKES ACCURATE SCREENING AFFORDABLE.

BYLINE: BY LIZ SZABO, STAFF WRITER

BODY:

Researchers at Eastern Virginia Medical School have tested new technology that could be the key to providing affordable, accurate hearing tests for all newborns in the days immediately after birth. The researchers plan to ask legislators to introduce a bill in the General Assembly next year that would mandate screening every newborn using this new technique. The Virginia Medical Society supports the proposed legislation.

Hearing loss is the most common birth defect, affecting six out of 1,000 newborns. Many more children lose their hearing later in life; roughly 8 percent of the adult population has some hearing loss. But many children with hearing problems are not diagnosed until they are 2 or 3 years old, a delay that can significantly delay their language development. ''Our goal for the state of Virginia is to have every child tested before they leave the hospital,'' said Dr. Barry Strasnick, director of pediatric otology at EVMS and a proponent of universal screening. Today, Virginia hospitals screen only newborns at high risk for hearing loss - those with risk factors such as low birth-weight, bacterial infections or a family history of deafness. But 90 percent of deaf children are born to hearing parents, Strasnick said. By testing only high-risk babies, doctors miss 50 percent of those with hearing loss, he said. Unlike old-fashioned hearing tests, the new procedure, called ''automated auditory brain-stem response,'' can be performed on infants - even while they are sleeping - because it does not require any conscious feedback from the child, Strasnick said. With the new procedure, sensors measure a baby's brain-wave responses to a series of clicks, delivered through cushioned earphones. Then a computer analyzes the baby's brain responses and compares those to the responses of a hearing child. Infants whose brain-wave responses vary from the norm are referred to audiologists, who can then determine whether a child has an ear infection or more permanent hearing loss. One of the procedure's main appeals is its automation, which reduces the need for specialists. The test can be administered by technicians or even health volunteers, who can take the portable equipment on the road into rural areas, Strasnick said. The screening equipment's price tag - $ 10,000 a unit - makes it too expensive for individual pediatricians, but affordable for hospitals, Strasnick said. Screenings cost between $ 18 and $ 35 each. If hospitals or health insurance companies agree to fund the procedure, doctors could test every newborn, Strasnick said. Most managed care health insurance plans typically pay hospitals a pre-set amount of money for each birth, leaving hospitals to decide how to divide the payments on

tests and procedures. Hospitals already test for many diseases at birth, although hearing loss is not part of routine testing. Strasnick hopes hospitals will agree to offer the hearing screening once they learn of the study's success. The EVMS study found the new procedure to be completely accurate, said John T. Jacobson, director of audiology at EVMS. The study had no false positive or negative screenings, he said. The National Institutes of Health has endorsed universal hearing screening, but some pediatricians oppose requiring it by law. Universal screening can only be effective if patients have access to audiologists for follow-up tests, said Dr. Frank Aiello, a pediatrician at EVMS and Children's Hospital of The King's Daughters. A law requiring a hearing screening would be expensive and difficult to put in place at rural hospitals, which often lack access to technology or audiologists, he said. Many pediatricians also have been concerned about false positive results. An earlier version of the technology found hearing loss in 25 percent of children screened, Strasnick said. Referring one-quarter of all babies for follow-up hearing exams would make universal screening impractical - as well as emotionally stressful for parents. But Strasnick and Jacobson found the new technology to be much more accurate. The test found abnormal hearing in only two of 100 babies tested. Ear infections caused by fluid in the ears - one of the most common early childhood illnesses - also show up. Doctors can treat such temporary hearing losses easily with antibiotics. Early diagnosis of hearing loss allows doctors to provide children with hearing aids, language therapy or surgery in order to prevent communication and developmental delays, Strasnick said. Most deaf and hard of hearing children are not diagnosed until they are 2 or 3 years old, after they have missed the most critical years of language acquisition, Strasnick said. The average deaf high school graduate reads at only a fourth-grade level - largely because of inadequate early language stimulation, he said. But deaf children of deaf parents who learn sign language as babies show equal language development with their hearing peers. Doctors can fit infants as young as 3 months old with hearing aids, said Claire Jacobson, director of audiology at Children's Hospital of The King's Daughters. And research has suggested that babies diagnosed before they are 6 months old - and who receive hearing aids and speech and language therapy - perform at the same level as hearing children by the time they are 5 or 6 years old, Claire Jacobson said. Karen Robinson wishes her daughter had been tested at birth. Alexis was not diagnosed as deaf until she was nearly a year old. The child, who now wears hearing aids and receives intensive speech and language therapy, has about the same speech development as any other 18-month-old baby, with a vocabulary of more than half a dozen words. Many deaf educators also endorse universal screening. ''Early testing is a great idea,'' said Lynn Frankel, sign communication coordinator at the Virginia School for the Deaf and Blind in Hampton. ''The sooner parents learn about the hearing loss, the sooner they can begin to accept it and do something about it.''

GRAPHIC: (Color Photo);
The new test measures a baby's brain-wave responses to sounds delivered through earphones, above.

Parents interested in having their children tested should ask their pediatrician about AABR, or call the audiology department at Children's Hospital of The King's Daughters at (804) 668-9327.

IAN MARTIN/The Virginian-Pilot;

The Virginian-Pilot (Norfolk, VA), May 7, 1997

Claire A. Jacobson, director of audiology at Children's Hospital of The King's Daughters, supports automated hearing screenings of infants like 5-month-old Kenneth Smith. The new procedure showed that Kenneth's hearing is fine.
LOAD-DATE: May 9, 1997

LEVEL 1 - 13 OF 19 STORIES

Business Wire

December 11, 1996, Wednesday

DISTRIBUTION: Health Editors

LENGTH: 498 words

HEADLINE: New Mexico adopts Natus Medical's ALGO 2; statewide infant hearing program well under way

DATELINE: SANTA FE, N.M.

BODY:
Dec. 11, 1996--The state of New Mexico has adopted Natus Medical's ALGO 2 in its Universal Newborn Hearing Screening Program (UNHSP).

The Children's Medical Services Program (CMS) of the New Mexico Department of Health initiated the program earlier this year. Its goal is to screen the hearing of every child born in the state. After barely a year in existence, 85 percent of the New Mexico birthing hospitals have initiated the program.

The target is to achieve universal newborn hearing screening in 100 percent of the New Mexico birthing hospitals by 1997. New Mexico's Universal "HEAR EARLY" Program is a partnership among public and private physicians, hospitals, audiologists and the Department of Health.

Of the 4 million babies born each year in the United States, nearly 24,000 face hearing impairment. The Children's Medical Services Program of the New Mexico Department of Health chose the ALGO 2 because it is a cost and labor efficient, automated test which can be administered by nurses or other health care technicians.

Immediate detection allows children with hearing disabilities the earliest possible start on learning to communicate normally. In the United States, the average age for detection of hearing impairment in children is 2-1/2 years. "By then, we've lost a lot of time in the formative years," said Mary Olguin, Ed.D, coordinator of the "HEAR EARLY" Program for the New Mexico Department of Health.

The lifetime cost for a person with profound hearing loss is more than $ 1 million; the ALGO 2 screening test is cost efficient and can be performed in less than 10 minutes. Children that receive early diagnosis, intervention and habilitation can have an early opportunity to develop to their full potential.

Hearing impairment compromises speech and language development. The ALGO 2 is used to test newborns within hours of their birth for their ability to hear. The device measures activity along the hearing pathway from the ear to the brainstem by placing three sensors on a sleeping baby's head, and recording the brain wave responses to sounds that are sent through disposable headphones placed over their ears.

The ALGO 2 detects hearing impairment with the highest level of accuracy available.

The ALGO 2 is a product of Natus Medical Inc., based in San Carlos, and a leading provider of newborn hearing screening products. The company's principal line of business is in designing, manufacturing and marketing automated auditory brainstem response (AABR) screening technology. AABR is a non-invasive, easy to use and reliable method to quickly screen newborns for hearing impairment. -0-
NOTE: Photos available on request.

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LANGUAGE: ENGLISH

LOAD-DATE: December 12, 1996