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Private Insurance Reimbursements for Newborn Hearing Screening in the United States, 2013–2014 Birth Cohort

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Abstract

The purpose of this study was to describe private insurance reimbursements for newborn hearing screening (NBHS) in the United States. Data from the MarketScan® Commercial Databases were used to estimate itemized reimbursements for privately insured infants born between January 1, 2013–December 31, 2014. Estimates were based on billed claims for hearing screening services during infancy among 456,407 infants with birth hospitalization claims (71,820 infants with inpatient NBHS and 1,104 infants with outpatient NBHS). The median reimbursement for NBHS was almost three times greater when performed in an inpatient setting than outpatient setting. Median reimbursement for NBHS performed in a hospital and billed as inpatient service was $148.00 (interquartile range [IQR] $99.52–$210.00) and $57.53 (IQR $34.40–$120.91) when billed as an outpatient service. The mean reimbursement for NBHS performed in an outpatient hospital setting was $136.48 (IQR $86.08–$220.15) and $41.60 (IQR $28.15–$57.52) for NBHS billed in conjunction with an office visit (e.g., performed in an audiology clinic, an audiologist's office, or physician's office during a routine check-up). No NBHS claims were filed for 84.3% of infants (384,587/456,407), as NBHS is generally included as a covered service bundled along with delivery and newborn care.

Acronyms: ABR = auditory brainstem response; CPT = current procedural terminology, ICD-9-CM = International Classification of Diseases, Ninth Revision, Clinical Modification; IQR = interquartile range; NBHS = newborn hearing screening; OAE = otoacoustic emissions

Keywords: newborn hearing screening, private insurance reimbursement, hearing loss

Disclaimer: The findings and conclusions in this report are those of the authors and do not necessarily represent the official position of the Centers for Disease Control and Prevention.

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Almost all infants in the United States are screened soon after birth for hearing loss using automated auditory brainstem response (automated ABR) and/or otoacoustic emissions (OAE). Both OAE and automated ABR tests provide non-invasive recordings of physiologic activity underlying normal auditory function for the purpose of confirming the presence or absence of a hearing loss (Wroblewska-Seniuk, Dabrowski, Szyfter, & Mazela, 2017). These reliable and objective methods of testing and screening can be easily performed in newborns and infants, either used alone or in sequence (Joint Committee on Infant Health [JCIH], 2007; Wroblewska-Seniuk et al., 2017).

Little is known about the healthcare cost of newborn hearing screening in the United States. Estimates of the resource cost of hospital-based NBHS in terms of staff time, instruments, and consumables in U.S. hospitals published between 1995 and 2002 ranged from $25 to $50 per infant screened, adjusted for inflation to 2016 U.S. dollars, but more current estimates are lacking (Grosse, Mason, Gaffney, Thomson, & White, 2018). In any case, there may be little relation between resource costs, charges, and reimbursements for hospital services. When NBHS is conducted by hospital staff, there is usually no separate bill and it is bundled in the overall labor and delivery charge (Winston-Gerson & Rousch, 2016). Some hospitals outsource hearing screening services to a contractor, who can bill families and insurers separately. Based on anecdotal parent reports, Winston-Gerson and Rousch (2016) reported a typical charge for NBHS by a contractor is $250 and could be in excess of $500.

An analysis of 2004 insurance claims data reported the average private-sector payer cost of screening for hearing loss in the hospital was $84 (95% confidence interval [CI]: $0–$200) when billed and paid separately from the labor and delivery charge (Grosse, 2006). McManus et al. (2010) reported proprietary estimates of typical direct provider payments by an employer health plan in 2005 was $82.01 for an OAE test with limited evaluation (current procedural terminology [CPT] code 92587) for the sole purpose of confirming the presence or absence of a hearing loss (McManus et al., 2010). The authors of that study did not include the other OAE screening CPT code (92558) in their estimates. The purpose of this

analysis was to provide more up-to-date information on reimbursement rates for privately insured infants who are individually billed for NBHS during infancy in both inpatient and outpatient settings.

Method

Data Source

This retrospective analysis used claims data from the IBM® MarketScan® Commercial Research Databases from 2013 through 2015. The commercial databases include employer-sponsored insurance claims data for approximately 30 to 40 million employees and their beneficiaries each year from all U.S. states. The databases contain fully integrated, de-identified, individual-level data across the entire continuum of care (e.g., inpatient, outpatient, outpatient pharmacy, laboratory) that capture real-world treatment patterns and expenditures (Truven Health Analytics, 2017). Each enrollee is assigned a de-identified unique number, allowing linkage across claims over time. MarketScan data is de-identified and their analysis is not classified by the Centers for Disease Control and Prevention as human subjects research and has been determined not to require an Institutional Review Board.

Claims were identified using the International Classification of Diseases, Ninth Revision, Clinical Modification (ICD-9-CM) codes (Table 1). Inpatient and outpatient data were extracted from MarketScan Research Databases (2013–2015) for infants born between January 1, 2013 and December 31, 2014, who were individually billed for NBHS, did not die during the study period, and had a first claim with a delivery code. The analysis included the following information: birth year, gender of patient (male/female), setting (inpatient/outpatient), outpatient place of service, census division, diagnoses, procedures, service date, procedure age (days), net payment, and health plan type. An algorithm (Figure 1 and Table 1) was used to create a proxy birth date using the admission date of the first inpatient claim for the baby containing a delivery code (ICD-9-CM: V30-31, V33-V34, V36-V37, and V39). We analyzed three CPT codes typically used for hearing screening (American Academy of Pediatrics, 2016): 92586 (automated ABR), 92558 (screening OAE), and 92587 (distortion product evoked OAE or OAE with limited evaluation). See Table 1 for detailed descriptions. OAE comprehensive diagnostic evaluation code 92588, used to bill for a test to determine the amplitude level of an otoacoustic emission output at each discrete frequency and not to determine the presence or absence of a hearing loss, was not examined. Service date was the date when the procedure or service occurred.

Table 1
List of Newborn Birth and Hearing Screening Codes

Code(s)	Code Description
Newborn ICD-9-CM Delivery Codes	
V30-31, V33-V34, V36-V37, V39	Live birth
Newborn Hearing Screening CPT Codes	
92586 Automated ABR	Auditory evoked potentials for evoked response audiometry and/or testing of the central nervous system; limited
92558 Screening OAE	Evoked otoacoustic emissions, screening; qualitative measurement of distortion product or transient evoked otoacoustic emissions, automated analysis
92587 OAE Limited Evaluation	Distortion product evoked otoacoustic emissions; limited evaluation (to confirm the presence or absence of hearing disorder, 3–6 frequencies) or transient evoked otoacoustic emissions, with interpretation and report

Note. ABR = automated auditory brainstem response; CPT = current procedural terminology codes; ICD-9-CM = International Classification of Diseases, 9th Revision, Clinical Modification; OAE = otoacoustic emissions.

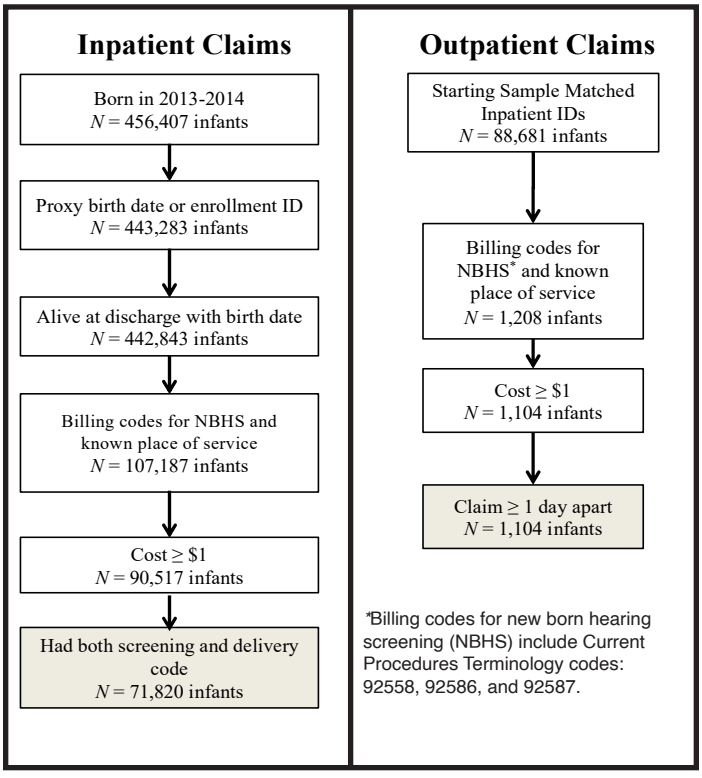

Figure 1. Flowchart depicting the selection process of inpatient (left) and outpatient claims (right) included in the present study. CPT = current procedural terminology.

Procedure age (days) was estimated using the difference between service date and proxy birth date. Net payment is defined as the payment received by the provider, excluding patient out-of-pocket and coordination of benefits. Claims were categorized as inpatient or outpatient using the place of service code. For inpatient claims, the place of service codes included inpatient hospital, hospital emergency room, and birthing center. Inpatient claims represent billing as occurring in the hospital inpatient setting when a patient was admitted into the hospital and a service was provided during the hospital stay. The outpatient place of service codes included outpatient hospital and office. Outpatient services can occur after an infant has been discharged from a hospital or birthing center. In the case of NBHS, the outpatient service can be a repeat or an initial screen. When place of service is coded as an office visit, the service can occur in an audiology clinic, an audiologist's office, or a physician's office during a routine well child visit. When the place of service is coded as outpatient hospital, the infant is receiving the service as an outpatient at a hospital-owned facility. Claims were categorized as nine census divisions defined by the U.S. Census Bureau (New England, Middle and South Atlantic, East and West North Central, East and West South Central, Mountain, and Pacific), and unknown region.

Data Analysis

In this descriptive analysis, all claims for services that an individual received on a given service date are assumed to refer to a single encounter. The proxy birth date was used to limit claims to the first year of life (infancy), that is, difference in days between service date and birth date (< 365 days). Mean, median, range, and interquartile range (IQR) of the net payments were calculated by summing each claim. Medical expenditures were adjusted for inflation to 2014 dollars and reported by care setting and place of service.

Claims were excluded if (a) enrollment ID was missing; (b) the infant died before discharge; (c) the difference between the service date and proxy birth date was a negative number (i.e., screening occurred before proxy birth date in which proxy birth date could not be determined); (d) infant was not individually billed for NBHS or place of service was unspecified; and (e) sum of the net payment for a single encounter was equal to or less than $1 irrespective if the claim was denied or reimbursed. Claims presumed to be duplicates of the initial claim were also excluded (claims with similar dates and billing codes). Inpatient claims were limited to those occurring during birth hospitalization (containing both NBHS and delivery codes). All analyses were conducted using SAS software version 9.4 (SAS Institute Inc., Cary, NC). Descriptive statistics (frequency counts and percentages) were used to compare mean and median reimbursement rates and IQRs by setting (inpatient/outpatient), outpatient place of service, and census division.

Results

Among 456,407 privately insured infants born during 2013–2014, 71,820 (15.7%) had inpatient claims for NBHS. Of those infants, 1,104 (1.5%) also had outpatient claims for NBHS (Table 2 and Figure 1). Mean reimbursement rates for NBHS were higher than the median reimbursement rates (Table 2). Median reimbursement for NBHS (IQR) performed in a hospital setting was $148.00 ($99.52–$210.00) billed as an inpatient service, and $57.53 ($34.40–$120.91) billed as an outpatient service. The median reimbursement for NBHS (IQR) was $136.48 ($86.08–$220.15) for an outpatient service in a hospital facility and $41.60 ($28.15–$57.52) for NBHS billed in conjunction with an office visit (Table 2).

Table 2
Descriptive Summary of Individually Billed Newborn Hearing Screening Claims for Infants Born 2013–2014

Variable	Newborn Hearing Screening	
	Inpatient	Outpatient
	n **(%)**	n **(%)**
Total Claims	72,146	1,300
Total Enrollees	71,820	1,104
Mean number of Claims (Range)	1.0 (1.0–1.0)	1.2 (1.0–4.0)
Net Payment Reimbursements		
Mean Net Payment (Range)	$159.46 ($1.04–$1580.10)	$96.89 ($2.03–$1320.78)
Median Net Payment (IQR)	$148.00 ($99.52–$210.00)	$57.53 ($34.40–$120.91)
Mean Net Payment for Outpatient Place of Service (Range)		
Office	N/A	$50.68 ($4.11–$714.00)
Outpatient Hospital	N/A	$169.87 ($2.03–$1320.78)
Median Net Payment for Outpatient Place of Service (IQR)		
Office	N/A	$41.60 ($28.15–$57.52)
Outpatient Hospital	N/A	$136.48 ($86.08–$220.15)
Gender of Patient		
Male	37,403 (52.1)	608 (55.1)
Female	34,417 (47.9)	496 (44.9)

Note. IQR = Interquartile Range.

Reimbursement rates for NBHS varied significantly by procedure and setting (Table 3). For inpatient NBHS and outpatient office visit NBHS, mean and median reimbursements for automated ABR (CPT 92586) were substantially higher than OAE hearing screening (CPT 92558 or 92587). The same was true for outpatient hospital-based claims, with reimbursements for automated ABR (CPT 92586) slightly higher than for OAE hearing screening (CPT 92558 or 92587). About half of the inpatient claims for NBHS (49.4%, 249/504) were for automated ABR. Most of outpatient claims for NBHS (94.2%, 750/796) were for OAE hearing screening services. The median reimbursement (IQR) for automated ABR was $150.00 ($104.40–$210.68) when billed as an inpatient screen, $102.18 ($75.81–$169.13) as an office hearing screen, and $164.34 ($94.02–$254.00) as an outpatient hospital screen. The median reimbursement (IQR) for screening OAE tests (CPT 92558) or OAE with limited evaluation (CPT 92587) was $57.80 ($29.37–$108.68) when billed as an inpatient service, $39.74 ($27.63–$52.54) as an office screening service, and $116.90 ($78.22–$178.27) as a hospital outpatient service.

In the outpatient setting, reimbursement rates were higher for OAE hearing screening (CPT 92558 or 92587) and automated ABR (CPT 92586) occurring as an outpatient hospital visit than an office visit, where hearing screens were performed in an audiology clinic, an audiologist's office, or a physician's office (Table 3). Irrespective of outpatient place of service, reimbursement for automated ABR (CPT 92586) was higher than OAE hearing screening (CPT 92558 or 92587).

Table 3

Unweighted Inpatient and Outpatient Hearing Screening Reimbursement Rates for Newborns Born between 2013 and 2014*

Inpatient Hearing Screen (n = 72,176 claims)			
CPT Codes	***n* (%)**	**Mean (Range)**	**Median (IQR)**
92558 or 92587 OAE	2,228 (3.1)	$73.38 ($2.25–$1121.48)	$57.80 ($29.37–$108.68)
92558 only	66 (0.1)	$63.86 ($8.40–$293.61)	$60.35 ($21.92–$95.85)
92587 only	2,162 (3.0)	$73.67 ($2.25–$1121.48)	$57.14 ($29.65–$109.24)
92586 Automated ABR	69,948 (96.9)	$162.20 ($1.04–$1580.10)	$150.00 ($104.40–$210.68)
Outpatient Newborn Hearing Screen (n = 1,300 claims)			
CPT Codes	***n* (%)**	**Mean (Range)**	**Median (IQR)**
Office			
92558 or 92587	255 (19.6)	$45.42 ($4.11–$360.00)	$39.74 ($27.63–$52.54)
92586	249 (19.2)	$136.33 ($31.71–$714.00)	$102.18 ($75.81–$169.13)
Outpatient Hospital			
92558 or 92587	750 (57.7)	$155.98 ($2.03–$1320.78)	$116.90 ($78.22–$178.27)
92586	46 (3.5)	$184.09 ($2.43–$650.00)	$164.34 ($94.02–$254.00)
Irrespective of outpatient place of service			
92558	39 (3.0)	$41.98 ($6.85–$176.27)	$33.00 ($12.78–$60.00)
92587	966 (74.3)	$74.75 ($2.03–$1320.78)	$47.64 ($30.74–$83.98)
92586	295 (22.7)	$176.65 ($2.43–$714.00)	$156.90 ($87.23–$250.00)

Note. CPT = Current Procedural Terminology; IQR = Interquartile Range.

*IBM® MarketScan® Commercial Databases for 2013–2015

As shown in Tables 4 and 5, the average reimbursement rates varied by census division. For inpatient hearing screens, the South Atlantic had the highest median reimbursement rate and East South Central had the lowest median reimbursement rate ($196.02, IQR $98.74–$239.14 and $107.93, IQR $85.22–$160.00, respectively; Table 4). For outpatient hearing screens, the lowest median reimbursement rates ranged from $32.02 (IQR $24.00–$58.28) in the West South Central to the highest $158.56 (IQR $57.52–$210.00) in the Pacific (Table 5). The census division with the highest median reimbursement for an outpatient service in a hospital facility and office visit were Middle Atlantic ($195.57, IQR $105.20–$254.00) and Pacific ($49.25, IQR $31.71–$57.52; Table 5).

Discussion

Our estimates of average reimbursement for NBHS by private insurers for screening conducted in birth hospitals are substantially greater than published estimates of the resource costs of providing such services. Published U.S. cost estimates for pre-discharge hospital screening have generally been in the range of $27 to $47 per infant

Table 4

*Summary of Inpatient Net Payment Reimbursement by Census Division**

Census Division	Inpatient Newborn Hearing Screening (*n* = 72,146 claims)		
	No. of Claims	Mean (Range)	Median (IQR)
New England	1,208	$175.11 ($2.57–$980.70)	$120.17 ($109.09–$215.10)
Middle Atlantic	6,493	$177.17 ($2.52–$1106.50)	$144.00 ($109.60–$239.00)
East North Central	6,680	$127.27 ($1.63–$840.00)	$116.00 ($104.21–$139.82)
West North Central	2,377	$117.54 ($2.80–$714.00)	$113.51 ($90.00–$135.00)
South Atlantic	9,735	$178.18 ($1.23–$1121.48)	$196.02 ($98.74–$239.14)
East South Central	5,718	$123.99 ($1.41–$490.04)	$107.93 ($85.22–$160.00)
West South Central	19,273	$185.79 ($1.15–$1580.10)	$185.00 ($148.00–$246.46)
Mountain	12,506	$139.02 ($1.32–$478.00)	$136.18 ($90.19–$179.25)
Pacific	7,505	$152.90 ($1.04–$576.78)	$143.40 ($81.42–$215.00)
Unknown Region	681	$157.17 ($5.31–$714.00)	$148.00 ($104.49–$204.30)

Note. IQR = Interquartile Range.

* IBM® MarketScan® Commercial Databases for 2013–2015

Table 5

*Summary of Outpatient Net Payment Reimbursement by Census Division**

Census Division	Newborn Hearing Screening Outpatient (*n* = 1,300 claims)				
	All Outpatient Claims			Outpatient by Place of Service	
	No. of Claims	Outpatient Mean (Range)	Outpatient Median (IQR)	Outpatient Hospital Median (IQR)	Office Median (IQR)
New England	25	$99.04 ($21.59–$482.11)	$66.40 ($40.23–$145.09)	$151.18 ($69.27–$164.21)	$40.23 ($40.23–$60.56)
Middle Atlantic	289	$100.92 ($2.43–$734.25)	$54.92 ($39.50–$121.50)	$195.57 ($105.20–$254.00)	$45.18 ($34.00–$54.92)
East North Central	95	$96.56 ($17.99–$1320.78)	$57.60 ($42.88–$93.33)	$102.66 ($81.48–$182.47)	$44.80 ($32.42–$57.60)
West North Central	26	$65.51 ($12.78–$176.27)	$47.37 ($39.65–$91.50)	$82.35 ($39.65–$105.00)	$45.00 ($21.00–$78.00)
South Atlantic	227	$113.32 ($4.11–$714.00)	$69.59 ($37.75–$140.18)	$169.06 ($93.25–$293.78)	$47.59 ($32.36–$81.23)
East South Central	92	$88.45 ($4.69–$640.80)	$51.82 ($33.90–$97.87)	$128.21 ($98.09–$287.66)	$38.57 ($33.90–$55.90)
West South Central	230	$62.04 ($4.43–$1122.66)	$32.02 ($24.00–$58.28)	$103.41 ($60.91–$182.59)	$30.48 ($21.34–$43.59)
Mountain	181	$78.67 ($2.03–$339.08)	$72.56 ($41.92–$106.77)	$94.02 ($72.56–$131.08)	$41.97 ($24.97–$61.10)
Pacific	126	$78.67 ($22.71–$550.00)	$158.56 ($57.52–$210.00)	$175.00 ($138.53–$281.86)	$49.25 ($31.71–$57.52)

Note. CPT = Current Procedural Terminology; IQR = Interquartile Range. Results for unknown region (*n* = 9) are not shown because of small numbers.

*IBM® MarketScan® Commercial Databases for 2013-2015

screened, adjusted for inflation to 2016 U.S. dollars (Grosse et al., 2018). In contrast, average inpatient NBHS reimbursements reported here, with IQR from $100 to $210 (Table 2), are several times as high.

Our retrospective analysis of the private insurance reimbursements rate for NBHS services using IBM® MarketScan® Commercial Research Databases (2013–2015) complements previous analyses (Grosse, 2006; McManus et al., 2010). There are a limited number of NBHS cost studies specifically looking at the reimbursement rate using the procedure codes. Whereas McManus et al. (2010) investigated the Medicaid reimbursement rates for all types of hearing services for infants and young children, our study provides reimbursement estimates by setting and type of screening services for privately insured infants. McManus et al. (2010) reported mean Medicaid reimbursement rates of $106.30 for automated ABR (CPT 92586) and $99.40 for OAE with limited evaluation (CPT 92587 adjusted for inflation to 2014 dollars) irrespective of inpatient or outpatient setting. Our mean estimates for automated ABR (CPT 92586: $162.26, range $1.04–$1580.10) and OAE with limited evaluation (CPT 92587: $74.00, range $2.03–$1320.78) irrespective of inpatient or outpatient setting

were higher for privately insured infants than for infants with Medicaid (results not shown).

It should be emphasized that the vast majority (84.3%) of privately insured infants who received a hospital-based NBHS were not separately billed for the service because the cost of providing a hearing screen for a newborn is typically bundled under the newborn delivery care charge. Consequently, the reimbursements reported here do not characterize how much hospitals are reimbursed for NBHS. The reimbursement rate reported here in most, if not all, cases reflect reimbursements to independent providers or contractors contracted to perform NBHS.

We were unable to find studies on the estimated resource cost of conducting screening by an independent provider or contractor contracted to perform NBHS. In contrast, we found several older studies that have reported resource cost estimates associated with NBHS conducted by hospital staff (Kezirian, White, Yueh, & Sullivan, 2001; Maxon, White, Behrens, & Vohr, 1995; Mehl & Thomson, 1998; Vohr et al., 2001). Kezirian et al. and Vohr et al. estimates were based on direct cost of the equipment, overhead, and all personnel cost including clerical administrative assistance cost. Kezirian et al. reported the cost of providing an OAE hearing screen was $13 per infant and the cost for an automated ABR hearing screen was $25 per infant. Vohr et al. reported $28.69 for an OAE hearing screen and $32.81 for an automated ABR hearing screen. Adjusting to 2014 dollars, the cost of providing an OAE hearing screen would range from $17.38 to $38.25 and the cost of an automated ABR screen would range from $33.42 to $43.86. These costs would not accurately describe the cost for independent providers or contractors contracted to perform NBHS. Since those cost estimates are very old, it is not clear that adjustment for inflation is sufficient. It would be helpful to have estimates from new hearing screening cost studies.

Reimbursement rates appeared to be dependent on the type of hearing screening service and place of service. Unlike previous studies that reported only mean reimbursements, this analysis provided means, medians, range, and IQRs for reimbursements. The median, unlike the mean, is not influenced by a small number of extremely large or small values. Therefore, the median net payment may provide a better estimate of the *typical* inpatient reimbursement.

This study provides new cost information on how the two screening methods were used across places of service, OAE, and automated ABR. Almost half (49.4%) of privately insured infants who were individually billed for NBHS as an inpatient received an automated ABR screen, while almost all (94.2%) infants who were individually billed for outpatient NBHS received an OAE screen (Table 3). The decision to use ABR screening equipment by a hospital for inpatient screening could be driven by both best practice considerations and the higher reimbursement rate relative to OAE hearing screen. On average, the claim for an automated ABR screen performed as an inpatient service (median payment) was reimbursed 2.6 times higher than for an OAE hearing screen performed in the same setting. The ratio of reimbursements between the two types of service was also the same for office visit claims, yet only half of inpatient visit claims were for OAE.

We found the median net payment per claim for NBHS was almost three times as high for inpatient as for outpatient claims (Table 2). This appears to largely reflect differences in the relative shares of automated ABR and OAE screening types between inpatient and office visits. Within those settings there were much smaller differences in reimbursements by service type. In hospital outpatient claims, reimbursements were similarly high for both service types (Table 3). Separately reporting outpatient and inpatient reimbursements provides a more comprehensive and accurate summary of the variability in reimbursement rates by type of service.

The higher average reimbursement for automated ABR than OAE hearing screening services performed as an inpatient service in the hospital is consistent with some published estimates of resource costs (Kezirian et al., 2001; Lin et al., 2005; Lin, Shu, Lee, Lin, & Lin, 2007). Performing automated ABR requires the use of disposable electrodes, which is not required for an OAE hearing screening procedure. The electrode supply adds to the total cost of providing an automated ABR hearing screen. However, a few studies reported little cost difference between automated ABR and OAE hearing screening services (Lemons et al., 2002; Vohr et al., 2001).

The median and mean reimbursements for an automated ABR screen performed for an outpatient hospital service, $164.34 and $184.09, were higher than the reimbursement rate in an office setting, $102.18 and $136.33, but similar to the inpatient hospital reimbursement rate of $150.00 and $162.20. For OAE hearing screens, the median and mean reimbursements were lower when conducted in an office setting, $39.74 and $45.42, than in an inpatient setting, $57.80 and $73.38. The highest reimbursement rate for OAE screening service took place in a hospital setting as an outpatient service, $116.90 and $155.98. In the inpatient and outpatient settings, reimbursements were lower for OAE than automated ABR hearing screen.

We were unable to find any previously published cost study specifically looking at the cost of providing hearing screening in an office as the place of service after infants have been discharged from the hospital. We were able to find the cost for providing *post-discharge* hearing screens in five hospitals in one study (Vohr et al., 2001). Vohr et al. reported the cost for providing an OAE screen as $66.87. According to our analysis, an outpatient OAE screen performed in a hospital setting was reimbursed at a median rate of $116.90 and a mean of $155.98 for privately insured infants. The cost for providing an ABR screen was reported as $95.04 (adjusted to 2014 dollars) by Vohr et al. and we found the median and mean reimbursement rates for an automated ABR screen (CPT 92856) were $102.18 and $136.33 respectively.

This analysis has several limitations. First, billing codes are subject to coding errors (O'Malley et al., 2005), which

means that some claims for what appear to be NBHS may actually be for a different service. Second, we examined claims data from 2013 to 2015 for the 2013–2014 birth cohort using ICD-9-CM codes to avoid the coding transition to ICD-10 on October 1, 2015. However, the claims data are now more than 4 years old and may be a bit dated. The estimates may have changed since the study was completed in 2017. Finally, the data used in this study comes from employer-based plans and cannot be generalized to other types of private payers. The MarketScan Commercial data have been found to be comparable in demographics to the U.S. population with employer-sponsored insurance (Aizcorbe et al., 2012), which in turn comprises more than 90% of the U.S. population with private insurance. However, MarketScan data cannot be generalized to populations with public insurance or no insurance.

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