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Sensorineural Hearing Loss – A Changing Paradigm for Its Evaluation

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Abstract

Objective—1) Determine how practicing clinicians evaluate patients with sensorineural hearing loss (SNHL), and 2) analyze the cost-effectiveness of current algorithms in the evaluation of these patients.

Study Design/Setting—An interactive online survey allowing respondents to order diagnostic testing in the evaluation of four simulated patients with SNHL across two testing encounters per patient.

Subjects and Methods—The survey was distributed to clinician members of the American Society of Pediatric Otolaryngology and the American Society of Human Genetics between May and August 2014. Statistical tests included Chi-square and non-parametric testing with Mann-Whitney U test.

Results—Otolaryngologists were significantly more likely to order repeat audiometric testing and significantly less likely to order genetic testing than other clinicians. Respondents who completed training more recently were significantly more likely to order MRI and EKG. On average, respondents spent \$4,756 in the evaluation of a single patient, with otolaryngologists spending significantly more than other clinicians. CT of the temporal bone (40%), ophthalmology consultation (39%), and genetics consultation (37%) were ordered most frequently in the first encounter. Comprehensive genetic testing was ordered least frequently on the first encounter (20%) but was the most frequently ordered test on the second encounter (30%).

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Conflicts of Interest AES and RJHS are members of the non-profit fee-for-service Molecular Otolaryngology & Renal Research Labs at the University of Iowa, which offers a comprehensive genetic test for deafness. The authors declare no conflicts of interest.

Supplemental Files Supplemental File 1: Complete survey in PDF format.

Conclusion—Recent guidelines advocate comprehensive genetic testing in the evaluation of patients with SNHL as early genetic testing can prevent uninformative additional tests which otherwise increase healthcare expenditures. Results from this survey indicate that comprehensive genetic testing is now frequently, but not uniformly, included in evaluation of patients with SNHL.

Keywords

Deafness; hearing loss; genetic testing; DNA sequencing

Introduction

Hearing loss (HL) is the most common sensory deficit in humans: 2–3 of every 1,000 children born in the United States have congenital HL, over 50% of which is genetic, significant enough to affect speech and language development^{1,2}. While early diagnosis in infants facilitates appropriate intervention and habilitation and thus speech and language development¹, identifying a specific etiology at any age impacts clinical care and HL management by providing prognostic information to patients and their families, refining genetic counseling, clarifying habilitation options, and identifying associated co-morbidities.

The diagnostic complexity of non-syndromic hearing loss (NSHL) is reflected by the myriad of tests that are available and have been advocated as part of the standard evaluation for this condition. The list includes laboratory studies such as an electrocardiogram (ECG or EKG), urinalysis, or thyroid hormone level; imaging studies like computed tomography (CT) or magnetic resonance imaging (MRI) of the temporal bone and renal ultrasound; and referrals to specialists such as ophthalmologists or genetic counselors. While not all tests are invariably ordered, these tests are costly and time consuming, and can have a low diagnostic rate and therefore a low value in establishing an etiology for the HL³.

Genetic testing for HL first became available in the late 1990s when variants in *GJB2* were recognized as a major cause of severe-to-profound congenital autosomal recessive and sporadic NSHL in developed countries⁴. Because *GJB2* has a single coding exon, genetic testing was simple, however with the discovery of additional genetic causes of autosomal recessive and autosomal dominant non-syndromic hearing loss, in the early 2000s testing transitioned from a *GJB2*-only strategy to serial gene-by-gene Sanger-based screening using patient-specific phenotypic data to drive the selection strategy for genetic testing⁵. For example, in an infant with congenital severe-to-profound deafness, in the absence of causal variants in *GJB2*, which was often screened as a 'first step' because sequencing was easy, the presence of delayed developmental motor milestones like delayed sitting and delayed walking would prompt genetic screening of the Usher Syndrome Type 1 genes. This step was a formidable undertaking because of the number of genes involved in Usher Syndrome Type 1 and their large size (six genes totalling 189 exons and 69,800 base pairs)⁶.

Recent advances in sequencing technologies now provide clinicians with a powerful diagnostic tool to evaluate HL and to inform patient management⁶. All genes implicated in NSHL can be screened simultaneously with outstanding accuracy to establish a genetic diagnosis. This test can be ordered first and the genetic report can then inform additional tests likely to be of benefit in patient care⁶. For example, in an infant with sporadic moderate

HL with causative mutations in *SLC26A4* identified by genetic testing, a CT scan to assess the enlarged vestibular aqueduct should be ordered; in contrast, if the HL was secondary to two variants in *TECTA*, no further testing would be warranted.

Several recent studies have studied the diagnostic yield of the battery of tests available for evaluation of patients with HL and have found wide ranges of clinical utility for these tests and have recommended tiered evaluation involving genetic testing^{7–9}. A recent position statement by the American College of Medical Genetics (ACMG) has advocated a tiered approach to the evaluation of HL to save costs, reduce incidental findings and improve overall diagnostic yield¹.

As there have been no studies to examine current practice in the evaluation HL in the wake of comprehensive genetic testing and the ACMG recommendations, we created an interactive survey to assess clinical preferences for tests and referral patterns in the evaluation of HL. The survey presents four simulated cases, each of which offers to the clinician two encounters during which the patient's HL can be evaluated. The responses provide a representative sample to determine the current algorithm clinicians use when evaluating patients with SNHL. We then compare the cost-effectiveness of the different algorithms used when evaluating patients with SNHL. We hypothesize that there remains high variability in the evaluation of these patients and that comprehensive genetic testing is not yet uniformly utilized amongst healthcare providers.

Materials and Methods

Survey Population

Healthcare professionals who care for patients with HL were targeted for survey distribution through two large professional societies: the American Society of Pediatric Otolaryngologists (ASPO) and the American Society of Human Geneticists (ASHG). ASPO is a society of over 500 members, which consists mostly of pediatric otolaryngologists. The ASHG is a society of nearly 8000 members whose membership includes researchers, academicians, clinicians and other individuals with an interest in human genetics. The survey distributed to the ASHG called specifically for clinicians/geneticists involved directly in the care of patients with HL. Although our survey targeted geneticists and pediatric otolaryngologists, the breadth of the ASHG population is broad and thus we allowed practitioners to identify themselves as 'Pediatrician' or 'Other'. Private practitioners who were 'associated with a medical center' were classified as private practice.

Survey Design and Testing

The survey instrument was designed using information reported in the literature and investigator-based hypotheses¹. We utilized simulated case-based scenarios as a means to analyze practice patterns. The survey begins with a brief section that solicits respondent-specific data, including practice demographics and training experience. Four patient cases then follow, each of which includes a brief history and audiometric data. Respondents are asked to order those diagnostic tests they would typically request in the evaluation of a patient with HL. The test battery includes repeat audiometry, audiometry on parents/family

members, congenital infection screening, thin-cut CT of the temporal bone, MRI of the temporal bone, EKG, urinalysis, ophthalmology consultation, genetics referral, genetic testing of *GJB2*, and multi-gene (comprehensive) genetic testing. After the first 'encounter', results of the requested tests are provided and a second encounter is simulated at which time additional testing can be ordered. At the conclusion of the second encounter, a summary of the case, including the final diagnosis and plan, is provided. There are no 'right' or 'wrong' answers. The full survey is available in Supplemental Files.

Cases Presented

The cases were selected to include a representative cross-section of patients with SNHL. They included:

- Case 1) A 40-year-old male with progressive HL, a positive family history of HL, and a final diagnosis of HL caused by a mutation in the gene *KCNQ4* (DFNA4)
- Case 2) A 6-month-old male with mild HL, no family history of hearing loss and a final diagnosis of HL caused by mutations in *STRC* (DFNB16)
- Case 3) A 12-year-old female with unilateral HL with no identified cause of hearing loss
- Case 4) A 12-month-old female with profound HL, no family history of hearing loss and a final diagnosis of Usher syndrome, Type 1D, secondary to mutations in the gene *CDH23*.

The Qualtrics online survey program (Qualtrics, Inc., Provo, UT) was used to administer the survey. The instrument underwent trial testing by screening committees from both ASPO and ASHG for functionality, quality, and adherence to specific societal guidelines. This study was granted exemption from consent by the Institutional Review Board of the University of Iowa.

Cost Data

As there is high variability in healthcare costs throughout the nation, we used costs at our home institution to represent the costs of the tests available through the case-based scenarios. Comprehensive genetic testing is available as a send-out test, regardless of institution, for \$1500. As insurance reimbursement is dependent on patient, comorbidities, state, insurance company, etc, we did not include this variable in our cost analysis.

Data Collection

The initial request for survey participation was sent by email using each society's respective list-serves. An introductory message from the research team and a survey link were included in the email. A follow-up reminder was sent to the same list 4 weeks later. The survey was closed after response rates decreased.

Measures, Variables, and Data Analysis

Questions with free response answers that were categorical variables were organized and tabulated with the most common answers being reported. Data were collated in Microsoft

Excel and analyzed in SPSS version 21. We divided respondents in to four categories for statistical analysis: occupation, time when clinical training was completed, type of practice (academic vs. private practice), and number of patients evaluated per month (Table 1). Statistical tests included chi-square with Pearson coefficient, as well as non-parametric testing with multiple comparisons (Mann-Whitney *U* Test). $p < 0.05$ was considered significant.

Results

Study Demographics

Demographic results are shown in Table 1. 111 respondents started the survey and 87 completed it (78% completion rate). Of the 24 respondents who did not complete the survey, 80% (19/24) were identified as otolaryngologists, 13% (3/24) identified as geneticists, and 8% (2/24) did not respond with an occupation.

The respondents identified themselves most commonly as otolaryngologists (61%), followed by geneticists (29%), as well as other clinicians (10%) including pediatricians (3%), genetic counselors (3%) and one each of pediatric neurologist, ophthalmologist and other (no answer). The majority of respondents (58/87, 67%) completed their clinical training between 1950s-`90s; the remainder (29/87, 23%) completed their clinical training in the 2000s and 2010s. These two groups were used for statistical analysis, as genetic testing for HL became widely available in the late 1990s. The majority of respondents were part of an academic practice (70%, 61/87), while the remainder were part of a private practice or private practice affiliated with a medical center (grouped as “private practice”, 29%, 25/87).

The majority of respondents (75/87, 86%) were fellowship trained, with Pediatric Otolaryngology (63%) being the most common fellowship followed by Clinical or Medical Genetics (23%). The majority of respondents (61/87, 70%) were also in academic practice. Although the majority of otolaryngologists (47/57, 83%) were pediatric otolaryngologists, for analysis purposes we grouped all Otolaryngologists together and referred to this group as “otolaryngologists”.

Of the respondents, 57% (50/87) saw 1–5 patients per month with HL, while 41% (36/87) saw more than 5. We found that of the respondents who saw more than 5 patients per month 95% (35/37) were otolaryngologists; the remaining two respondents identified as a pediatrician and a genetic counselor.

Diagnostic Tests Ordered

Table 2 shows the overall frequency of respondents ordering each type of test across all four cases including both encounters for each case (8 total encounters). Ophthalmology consultation, CT of temporal bone and genetics consult were ordered at least once by 85%, 83% and 82% of respondents, respectively, making them the most frequently ordered test or consult. Repeat audiometric testing, electrocardiogram (EKG) and congenital infection screen were ordered least frequently (ordered at least once by 62%, 63%, and 63% of respondents, respectively). Multi-gene (comprehensive) genetic testing was ordered slightly more than single-gene (*GJB2*) testing (78% vs. 74%, respectively). For the majority of

diagnostic tests, there was no significant difference in ordering frequency based on occupation. However, compared with geneticists, otolaryngologists were significantly more likely to order repeat audiograms or ABR (77% for otolaryngologists vs. 32% for geneticists, $p<0.00$) and significantly less likely to order comprehensive genetic testing (70% for otolaryngologists vs. 96% for geneticists, $p<0.01$).

Differences in tests ordered reflected time of clinical training. Respondents who completed training after 1990 were significantly more likely to order MRI and EKG as compared to their more senior colleagues (90% vs. 55% for MRI, $p<0.01$; 79% vs. 55% for EKG, $p<0.02$). Respondents who see more patients were also significantly more likely to repeat ABR/audiogram testing and less likely to order comprehensive genetic testing (83% vs. 46% for ABR/audiogram, $p<0.00$; 67% vs. 86% for comprehensive genetic testing, $p<0.03$). There were no significant differences in the overall frequency of tests ordered across cases based on practice type (academic vs. private practice) (Table 2).

Tests Ordered by Encounter

As shown in Figure 1, the most commonly ordered test on the first encounter when averaged across all four cases was CT of the temporal bone (40%) followed by ophthalmology (39%) and genetics consultations (37%). The least commonly ordered tests on the first encounter were comprehensive genetic testing (20%), congenital infection screen (21%), and EKG (24%). On the second encounter, the most commonly ordered test was comprehensive genetic testing (30%) followed by genetics consultation (13%) and congenital infection screen (8%).

Tests Ordered by Case

We also examined the tests ordered by respondents for each case when both encounters were combined in order to better understand overall ordering patterns (Figure 2). Congenital infection screens were ordered less frequently in adult patients (Case 1 and 3 at 3% and 7%, respectively). Case 3 involved the only patient with unilateral hearing loss. Respondents ordered CT of the temporal bone most frequently in this case (ordered by 60% of respondents compared to 47%, 45%, and 38% for cases 1, 2, and 4, respectively). Respondents ordered genetic testing least frequently for this case, including both single gene testing (ordered by 18% compared to 26%, 46%, and 38% for cases 1, 2, and 4, respectively) as well as multi-gene testing (ordered by 36% compared to 68%, 59%, and 40%, for cases 1, 2, and 4, respectively).

Costs of Tests Ordered

On average, four tests were ordered per encounter with no significant differences between groups. The most expensive tests were MRI (\$5163), CT of temporal bone (\$2047), and comprehensive genetic testing (\$1500). The least expensive tests were urinalysis (\$47), congenital infection screen (\$100) and EKG (\$258) (Table 3).

Respondents spent an average of \$4756 per case (Table 4). Case 1 was the least expensive (\$4544) while Case 4 was the most expensive (\$5325). On average across all four cases otolaryngologists spent significantly more money evaluating HL than did geneticists (\$5152

vs. \$3807, $p<0.02$). Respondents who completed clinical training after 1990 also spent significantly more per case than their older counterparts (\$5252 vs. \$4508, $p<0.00$). Academicians spent more than private practitioners (\$4816 vs. \$4444), as did persons who saw more patients (\$5085 vs. \$4437), although these differences were not significant.

Discussion

The goal of this study was to determine how practicing clinicians evaluate patients with SNHL. Until recently, the primary objective was to exclude syndromic forms of hearing loss that carry associated morbidities like kidney disease, blindness or cardiac arrhythmias, with a myriad of tests and referrals. However since the introduction of clinical genetic testing for SNHL, the focus has shifted to establishing an etiological diagnosis using genetic testing. The ACMG recently released a guideline¹, which included comprehensive genetic testing as part of the standard evaluation, however no otolaryngologists were included as part of the drafting committee. In this study, we used a survey simulating four case encounters to determine how clinicians – both otolaryngologists and non-otolaryngologists – evaluate SNHL on a daily basis.

Our analysis reveals that despite differences in training, geneticists and otolaryngologists are statistically equally likely to order audiograms of parents, congenital infection screen, CT and MRI of the temporal bone, EKG, UA, ophthalmology consultation, genetics consultation, and DFNB1 genetic testing. The areas of difference are in ordering repeat audiograms, which are ordered more frequently by otolaryngologists, and multi-panel genetic testing, which are ordered more frequently by geneticists. Despite being more likely to order comprehensive genetic testing initially, geneticists ultimately spend significantly less than otolaryngologists in their workup of these patients.

Establishing a diagnosis for SNHL is challenging and the relative value of the tests to consider can be confusing. The results of our survey attest to this complexity and suggest there is no universally accepted diagnostic algorithm. Rather than following consistent evidence-based algorithms, we suspect preferences reflect clinical familiarity with individual tests. As newer tests like comprehensive genetic testing have become available, integrating them into the evaluation process can be slow, especially if clinicians are unfamiliar with the technology and have difficulty in interpreting the final report. Because clinical geneticists may be more familiar with interpreting the results of comprehensive genetic testing as compared to otolaryngologists, they may be more comfortable ordering this test.

The current consensus is that HL should be evaluated using a tiered testing approach that emphasizes history and physical exam followed by genetic testing, with imaging studies considered if genetic testing is negative or inconclusive.¹ This consensus is based on the premise that the diagnosis should be made using the fewest tests possible and that the various tests have differing diagnostic utility^{3,7–12}. While sensitivity and positive diagnostic rates vary widely, imaging studies are thought to have the highest diagnostic yield (about 30% for CT and 26% for MRI in systematic reviews^{10,11}), and are certainly better than genetic testing if genetic testing is limited only to *GJB2* mutation screening^{7,12}. Recent

studies, however, show that comprehensive genetic testing has a diagnostic rate of 37–60%^{13–15}, making it the single best test to order in the evaluation of SNHL.

There are several, well-documented reasons to support the use of comprehensive genetic testing in the diagnosis of SNHL. As the cornerstone of precision medicine for hearing health care, the results of comprehensive genetic testing for HL can lead to improved diagnosis and clinical management of patients with HL. Examples include the diagnosis of Jervell and Lange-Nielsen syndrome (JLNS), the Usher syndromes, Deafness-Infertility Syndrome and mtDNA-related hearing loss⁶. However, not only is comprehensive genetic testing clinically appropriate, it is also cost-effective. As a single test, it is less expensive than any temporal bone imaging modality, and as multiple studies have shown, it has the highest single-test positive diagnostic rate overall^{3,6, 10–11,13–15}. The notable exception is unilateral hearing loss, as these patients infrequently have identifiable causes of genetic hearing loss even with comprehensive genetic testing.⁶ In the cost-conscious climate of today's healthcare industry, otolaryngologists may benefit from utilizing comprehensive genetic testing earlier in their diagnostic algorithm, similar to the geneticists in this study, who demonstrated a more cost-effective evaluation of patients with SNHL in our analysis.

The strength of this study is its use of simulated case scenarios to determine how providers evaluate patients with SNHL. However, there are several limitations that warrant mention. First, ASPO was the only resource used to disseminate this survey to otolaryngologists and as such, these results are likely only generalizable to the pediatric otolaryngology population. Second, the cost-effectiveness analysis is limited because we did not consider insurance reimbursement. By presenting our data in the context of hospital charges for individual tests and consultations, however, we sought to eliminate inconsistencies introduced by including insurance reimbursement, which can be highly variable. Thus, our cost data do not represent the ultimate out-of-pocket cost to the patient but rather the cost charged by the hospital and may not be generalizable in all circumstances.

In conclusion, while recent guidelines support the use of comprehensive genetic testing early in the evaluation of SNHL as a step to increase the diagnostic rate and decrease the utilization of uninformative tests, we found significant variability in respondents' testing approach. Although an algorithm utilizing comprehensive genetic testing has the potential to decrease healthcare expenditures in the evaluation of HL, clinicians have not uniformly incorporated this new test into their clinical practice.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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Figure 1.

Tests ordered by encounter. Values shown are the percent of all respondents who ordered a particular test on either the first or second encounter, averaged across all four cases.

Figure 2.

Tests ordered by case. Values shown are percent of all respondents who ordered a particular test either in the first or second encounter for each case. Case 3, the case which involved unilateral hearing loss, is highlighted in yellow.

Table 1

Survey demographics

		%	n/total
Completed Survey	-	78%	87/111
Occupation	Otolaryngologist	61%	53/87
	Geneticist	29%	25/87
	Other *	10%	9/87
Finished Training	1950s	1%	1/87
	1960s	0%	0/87
	1970s	16%	14/87
	1980s	20%	17/87
	1990s	30%	26/87
	2000s	28%	24/87
	2010s	6%	5/87
	No response	5%	4/87
Fellowship	Yes	86%	75/87
	No	11%	10/87
	No response	7%	6/87
Fellowship Type	Pediatric Otolaryngology	63%	47/75
	Clinical/Medical Genetics (Geneticist)	23%	17/75
	Other	4%	3/75
	Otology/Neurotology	1%	1/75
	No Response	4%	3/75
Practice Type	Academic	70%	61/87
	Private Practice	29%	25/87
	No Response	1%	1/87
Patients with SNHL seen per month	0 patients	1%	1/87
	1–5 patients	57%	50/87
	6 patients	41%	36/87

For no answer responses the value was excluded from demographic analysis.

* Other occupations include: Pediatrician (3), Genetic Counselor (3), Pediatric Neurologist (1), Ophthalmologist (1), Other – no response (1). SNHL, sensorineural hearing loss.

Table 2

Percent of respondents ordering each test at least once across all four cases and two encounters per case. Chi-square 2-sided test of significance used for proportion comparison, $p < 0.05$ considered significant, underlined and bolded were found to be significantly different.

Test Ordered	All Respondents (n=87)	Occupation			Completion of Training		Practice Type		Patients Seen Per Month	
		Otolaryngologist (n=57)	Geneticist (n=25)	Other (n=9)	1950s–1990s (n=58)	2000s–2010s (n=29)	Academic (n=61)	Private Practice (n=25)	1–5 Pts/mo (n=50)	6 Pts/mo (n=36)
Repeat audiogram/ABR	62%	<u>77%</u>	<u>32%</u>	56%	60%	66%	62%	60%	<u>46%</u>	<u>83%</u>
Audiogram of parents	76%	81%	64%	78%	76%	76%	75%	76%	72%	81%
Congenital infection screen	63%	64%	60%	67%	62%	66%	62%	64%	66%	58%
CT temporal bone	83%	87%	80%	67%	84%	79%	87%	72%	78%	89%
MRI temporal bone	67%	72%	52%	78%	<u>55%</u>	<u>90%</u>	69%	60%	66%	67%
EKG	63%	66%	60%	56%	<u>55%</u>	<u>79%</u>	61%	68%	64%	61%
UA	66%	68%	64%	56%	67%	62%	67%	60%	62%	69%
Ophthalmology Consult	85%	83%	84%	100%	83%	90%	84%	92%	88%	83%
Genetics Consult	82%	89%	76%	56%	79%	86%	82%	80%	78%	86%
DFNB1 genetic testing	74%	74%	76%	67%	74%	72%	72%	76%	80%	64%
Multigene panel genetic testing	78%	70%	96%	78%	79%	76%	80%	72%	86%	67%

Table 3

Costs of tests ordered for evaluation of sensorineural hearing loss at our institution.

	Physician Charge (\$)	Hospital Charge (\$)	Total Charge (\$)
Auditory Brainstem Response	255	1,114	1,369
Audiometry	145	279	424
Ophthalmology Consult	363	167	530
CT of Temporal Bone	317	1,730	2,047
MRI of Temporal Bone	586	4,577	5,163
Electrocardiogram	85	173	258
Urinalysis	-	47	47
Renal Ultrasound	145	484	629
Congenital Infection Screen	-	100	100
Genetics Consult	530	167	697
<i>GJB2/DNFB1</i> Gene Testing	-	324	324
Multigene Genetic Testing Panel	-	1,500	1,500

Table 4

Cost comparison of tests ordered for evaluation of sensorineural hearing loss. All values are given in USD (\$). Values are mean (standard deviation). Means were compared with the non-parametric Mann-Whitney *U* test, with $p < 0.05$ considered significant, values underlined and bolded were found to be significantly different.

Case	All Respondents n=87	Occupation			Completion of Training		Practice Type		Patients Seen Per Month	
		Otolaryngologist n=53	Geneticist n=25	Other n=9	1950s–1990s n=58	2000s–2010s n=29	Academic n=61	Private Practice n=25	1–5 Pts/mo n=50	6 Pts/mo n=36
Avg of 4 Cases	4,756 (2,109)	<u>5,152</u> (2,117)	<u>3,807</u> (1,726)	5,057 (2,405)	4,508 (1,909)	5,252 (2,420)	4,816 (2,096)	4,444 (2,033)	4,437 (2,036)	5,085 (2,094)
Case 1	4,544 (2,778)	4,961 (3,055)	3,727 (1,982)	4,358 (2,685)	4,602 (2,833)	4,428 (2,709)	4,368 (2,724)	4,832 (2,901)	4,500 (2,782)	4,508 (2,788)
Case 2	4,592 (2,528)	4,662 (2,445)	3,766 (2,223)	6,473 (2,977)	4,342 (2,213)	5,092 (3,044)	4,658 (2,391)	4,220 (2,702)	4,450 (2,401)	4,644 (2,610)
Case 3	4,562 (2,707)	4,880 (2,770)	3,757 (2,216)	4,924 (3,369)	<u>3,921</u> (2,450)	<u>5,842</u> (2,783)	4,634 (2,807)	4,235 (2,420)	4,366 (2,535)	4,729 (2,919)
Case 4	5,325 (3,208)	<u>6,104</u> (3,331)	<u>3,979</u> (2,420)	4,473 (3,228)	5,165 (3,088)	5,644 (3,470)	5,602 (3,244)	4,489 (2,997)	<u>4,430</u> (2,688)	<u>6,458</u> (3,501)