

# CASE STUDY

## Improved Hearing and Resolution of Otitis Media with Effusion Following Chiropractic Care to Reduce Vertebral Subluxation

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### Abstract

**Objective:** The chiropractic care of a child with upper cervical vertebral subluxation, ear pain, and hearing loss after unsuccessful allopathic treatments for recurrent chronic otitis media with effusion is described.

**Clinical Features:** A three year old girl had bilateral ear pain and hearing loss after three unsuccessful implantations of tympanostomy tubes and multiple medications.

**Intervention and Outcome:** Contact-specific, high-velocity, low-amplitude adjustments (i.e. Diversified Technique) were applied to the sites of vertebral subluxation. Cervical distraction exercises were also recommended as an adjunct to care. The patient reported an increase in hearing and the child's mother reported the child had less ear pain, was less irritable, and had better speech after the initiation of chiropractic co-management. Medical audiology reports document speech and hearing improvements after the implementation of chiropractic care.

**Conclusion:** The chiropractic care of a child with chronic recurrent otitis media, effusion, bilateral hearing loss and upper cervical subluxation is presented. Marked resolution of the patient's chief complaint was observed and confirmed by a re-evaluation with her pediatrician and audiology tests. Reduction of an upper cervical vertebral subluxation of C1 aided the restoration of hearing and normal eustachian tube physiology

**Key Indexing Terms:** child, otitis media, effusion, hearing loss, upper cervical subluxation, chiropractic

### Introduction

Otitis media with effusion (OME) is one of the most common diagnoses of children by pediatricians in the United States.<sup>1-6</sup> The OME diagnosis accounted for over one third (35%) of all pediatrician visits in the nation in 1990 and 46% of all three year-olds have experienced three or more episodes of this condition.<sup>7,8</sup> It is important to distinguish acute otitis media from otitis media with effusion (OME). Acute otitis media involves fluid in the middle ear with signs or symptoms of intense local or systemic infection, whereas otitis media with effusion involves the presence of middle ear fluid without signs or symptoms of acute infection.

The common allopathic treatments for otitis media with effusion are prescription antibiotics, myringotomy, and tympanostomy tube insertion to drain the accumulation of middle ear fluids. According to the Agency for Health Care Policy and Research (AHCPR) these and other treatments for OME equaled to an estimated total annual expenditure of \$5 billion spent on children five years or younger in the United States in 1994.<sup>9</sup>

Tympanostomy tube insertion is the second most common operation in the world, surpassed only by circumcision.<sup>10</sup> Often the course of chronic recurrent otitis media with effusion combined with multiple insertions of tympanostomy

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tubes is the cause of further irritation to the ear and has been documented to be the cause of greater than 20 dB of hearing loss and other developmental disorders of speech and language development.<sup>2, 10-12</sup>

The cost-effectiveness of current allopathic treatments for otitis media is under scrutiny and the most beneficial treatments for the condition are still heavily debated. A need for a more cost-effective treatment option with decreased risk of side-effects is warranted. The objective of this case report is to examine a more conservative method of care for this condition through chiropractic management. Children are often seen by chiropractors for asthma, ear, nose and throat disorders, colic, allergies, enuresis and general preventative care.<sup>13</sup> The chiropractic approach to OME may support a decrease risk of side-effects and help to lower health care costs to both the government and the public.

## Case Report

### *Patient History*

The patient was a three year old girl treated for complaints of bilateral ear pain, previously diagnosed by her pediatrician as bilateral otitis media with effusion (fluid accumulation). She had associated bilateral hearing loss and neck tenderness. The mother supplied the following history leading to the child's complaint.

The mother stated that her daughter was born full-term through a normal vaginal birth, with no complications. She was breast-fed up until eleven months of age. The child has one older and one younger brother that have had no history of ear complaints. The patient attends day care (preschool) three to five times per week. The mother first started noticing symptoms of irritability when her daughter was one year old. She was taken to her pediatrician and diagnosed with her first case of acute otitis media with effusion. The mother stated that her daughter had recurrent bilateral ear problems every two weeks since the initial diagnosis, with a significant amount of fluid accumulation in both ears. She stated the ear complaints were worse during allergy seasons (i.e. spring and early summer). The mother also stated that she and her preschool teacher noticed the child was not responding well to auditory stimuli and that speech was affected because the child began pronouncing "f's" in front of every word.

An audiological evaluation from the patient's ENT prior to chiropractic care documented warble tones, reduced speech audiometry (Speech Recognition Threshold [SRT] values), and abnormal immittance audiometry in the fields of tympanometry type, static composition, canal volume and pressure (Figure 1). Several tests were not performed (NP) on the child's right ear due to a ruptured right tympanic membrane at this visit. Minimum response levels for hearing are normally tested in children at four frequencies: 500, 1000, 2000 and 4000Hz. Studies that have examined hearing sensitivity in children with OME report pure tone hearing losses ranging from normal hearing (0dB) to moderate hearing loss (0-55dB). The 50<sup>th</sup> percentile is around 25dB hearing level.<sup>14,15</sup> Our patient was close to this value at 20dB hearing level (Figure 1).

Several antibiotic ear drop medications (i.e. Keflex, etc.) as well as oral antibiotics (i.e. Omnipen, Amoxicillin, Augmentin) were initially prescribed to the patient by her pediatrician. These medications only briefly relieved the child's symptoms and the fluid in the middle ear remained, leading the pediatrician to prescribe the implantation of tympanostomy tubes bilaterally to drain the middle ears. The child has had three sets of tympanostomy tubes total, with the third set being removed due to complications of excessive fluid accumulation, tympanic membrane rupture, mild speech disturbances and bilateral hearing loss.

The mother wished to try another form of treatment for her daughter since the current allopathic approach was not relieving the child's complaints. The mother brought her daughter to the chiropractor to try chiropractic management of the child's complaint. A re-evaluation with the patient's pediatrician was scheduled for one month later to decide if a fourth set of tympanostomy tubes or surgery (myringotomy) would be necessary.

### *Chiropractic Examination*

The child initially presented to the chiropractor as extremely irritable, crying and clinging to her mother. She had noticeable pyorrhea emitting from her eyes, ears and nose. A physical examination of the child revealed the following findings.

Upon posture analysis, the child demonstrated a right head tilt. Static palpation revealed point tenderness at the C1 transverse processes bilaterally, but increased pain and tenderness on the right side. The C1 right transverse process was palpated more prominently on the right side and to the posterior. There was mild tenderness of the C2 spinous process. Motion palpation of the cervical spine revealed restricted left rotation of C1 over C2, and restricted movement of C2 in flexion. No other vertebral restrictions were noted at the time of examination.

There was notable anterior and posterior lymphatic chain enlargement along the course of the sternocleidomastoid (SCM) muscles, bilaterally. The SCM and sub-occipital muscles were notable for significant hypertonicity bilaterally, but were more hypertonic on the right side. The chiropractic diagnosis as indicated by the exam was cervical subluxation of C1 with associated cervical muscular stiffness (SCM and sub-occipitals) and articular restrictions between C0-C1 and C1-C2. The mother stated that the child had constant irritation with marked (moderate) impairment of daily activities such as restlessness, hearing and speaking difficulties.

### *Chiropractic Care*

A specific contact, high-velocity, low amplitude adjustment was applied to the first cervical vertebrae (C1) using Diversified Technique. The patient's vertebral listing was an ASRP of Atlas (C1), found by motion and static palpation. This means that the atlas was positioned anterior and superior (AS) over the axis (C2) with the right C1 transverse process misaligned in a right lateral translation (R) with posterior rotation of the right transverse process (P). Attempt to reduce this subluxation was through the chiropractic adjustment of C1. Due to the child's irritability the first adjustment was

performed with the child in her mother's arms using an Activator instrument set to a low setting. The Activator is a chiropractic manual adjusting instrument that provides a correction through a spring-coil impulse that the doctor controls. The rubber tip of the Activator was placed on the child's right C1 transverse process, and the doctor stabilized the left skull and left C1 transverse process. An impulse was directed in a right to left and posterior to anterior line of correction. All other cervical adjustments at concurrent visits were performed with the child in the supine position with manual doctor contact using Diversified technique.

Diversified technique involves the use of static and motion palpation of the spine to identify areas of vertebral subluxations. The subluxations are then corrected by the doctor using manual adjustments. In this case, an upper cervical (C1 subluxation) was found and manually adjusted.

The patient's vertebral listing was an ASRP Atlas, and the adjustment proceeded as follows. The patient was in the supine position with the doctor standing at the right head of the table in a 45 degree angle towards the patient's left ASIS. The doctor contacted the right C1 posterior aspect of the transverse process with the lateral distal index finger. The patient's head was laterally flexed over the contact to the right, and then rotated to the left approximately 45 degrees. A high velocity, low amplitude impulse was applied in the line of correction, posterior to anterior, right to left, superior to inferior.

After the adjustment, cervical distraction of the atlanto-occipital and atlanto-dental articulations was applied. This procedure entailed the doctor distracting the occiput from the atlas (patient either seated or supine), and then the atlas (C1) from the axis (C2) by lifting the base of the skull from the cervical spine for a period of 10-15 seconds, two to three times. This procedure was taught to the mother at the initial visit, and was recommended as part of the adjunct at-home care plan, to be performed twice a day for three weeks. A dietary recommendation to cut out all dairy products from the child's diet for three weeks was also recommended. The initial care plan included chiropractic evaluations five times per week for three weeks with a re-evaluation after three weeks.

At the time of the initiation of chiropractic care the child was not taking any of her prescription antibiotics or ear drops. She was taking some allergy medications prescribed by her pediatrician. The patient was seen fourteen times during an approximately one month period with a re-evaluation with her pediatrician at that time.

### *Outcome*

The first signs of relief from her complaints began after the seventh chiropractic visit when the patient's mother stated that her pre-school teacher found her to be more attentive and the child commented to her teacher and mother, "I can hear again." Continual improvements in attentiveness, interaction at school and play and decreased bouts of irritability were noted by the mother, preschool teacher and chiropractor throughout her chiropractic care. During the re-evaluation with her pediatrician to discuss possible necessity for further

medications, tympanostomy tube implantations or surgery (myringotomy) it was concluded by the pediatrician that these treatments were unnecessary due to restored hearing and diminished contained middle ear effusion.

The audiology evaluation from this visit is included in Figure 2 and documents no warble tones and improved (normal) speech audiometry (SRT) values of 15 bilaterally. Imittance audiometry also improved with both ears hearing the same tympanometry type (As), peak compensated static acoustic admittance (Static. Comp.) balanced out at 0.2 bilaterally, canal volume was near the normal value (0.3-0.9cc) with the right (0.6cc) and the left (0.5cc), and tympanometric peak pressure (Press.) levels were splayed but returning to normal, with the right (30) higher than the left (5) due to a healing right tympanic membrane.

Tympanograms are classified into three main types: Type A (normal); two subgroups under normal include Type AD (deep curve associated with an abnormally compliant middle ear, seen in loss of elastic fibers in the tympanic membrane), and Type As (shallow curve and stiff system, seen in otosclerosis). The other two main groups include: Type B (flat, clearly abnormal, secondary to non-compressible fluid in the middle ear (OME), or tympanic membrane perforation), and Type C (significantly negative pressure in the middle ear, possibly indicative of pathology).<sup>16</sup> As can be seen, comparing Figure 1 with Figure 2, the tympanometry type for the patient's right ear went from clearly abnormal (Type B) to normal but shallow (As). A normal mechanism would demonstrate a Type A tympanogram. The reason our patient demonstrates Type As (shallow curve and stiff system) in Figure 2 is due to the healing process of her previously perforated right tympanic membrane (note the AD remarks at the bottom of Figure 1). After reviewing this report and noting improvement, the patient's chiropractic care plan was then reduced to three visits per week for two weeks with the goal of one to two visits a month for wellness and preventative care. The patient has been following through with this care plan.

## **Discussion**

### *Allopathic Treatment*

The allopathic treatment for chronic recurrent otitis media with effusion by tympanostomy tubes has often been scrutinized due to the risk of hearing loss, cholesteatoma, tympanosclerosis and rupture of the tympanic membrane.<sup>6,17-20</sup> It has been estimated that 27% to 32% of tympanostomies performed may be unnecessary due to a lack of consensus on which children benefit most from this procedure.<sup>21</sup> OME has been described in many sources as being a highly prevalent, multifactorial, age-dependant disease.<sup>1,2,5</sup> The 2004 comprehensive clinical practice guidelines for the diagnosis and management of OME recommended a more conservative management for this condition with six months of watchful observation in otherwise normal children with bilateral OME and hearing loss.

These new guidelines were jointly issued by the American Academy of Otolaryngology Head and Neck Surgery, the American Academy of Family Physicians, and the American Academy of Pediatrics.<sup>22</sup>

## Chiropractic Care

With these guidelines moving in a direction toward more conservative care, chiropractic management and prevention of OME deserve consideration. In an evaluation of chiropractic treatment protocols for otitis media and asthma in children, it was found that 67% of chiropractors used manual adjusting procedures in their management, followed by dietary recommendations (17%), soft tissue therapy (8%) and supplementation (8%). Secondly, this report revealed the chiropractic adjustment of atlas (C1) was applied to every one of the otitis media cases.<sup>23</sup> Multiple case studies and reports have supported the use of chiropractic adjustments for the treatment of vertebral subluxations. Removal of these vertebral subluxations has been associated with a palliative effect on the restored normal physiology of the child's Eustachian tube and therefore positive outcomes for the conservative management of OME.<sup>3,4,6,23-28</sup> In a study of 332 children with otitis media under chiropractic care, acute OM, chronic/serous OM and mixed OM were evaluated. With application of high-velocity, low-amplitude (HVLA) cervical adjustments (i.e. occiput and other cervical segments) plus sternocleidomastoid muscle effleurage, the patients' experienced normal otoscopic exams after one week, with an average of four to six treatments.<sup>3</sup>

### Mechanism

The ability of the chiropractic adjustment to affect eustachian tube (ET) physiology is hypothesized in several studies.<sup>3,4,24-28</sup> The myologic component of the vertebral subluxation complex can explain the relation between an over-facilitated muscle due to an upper cervical vertebral subluxation and an increase in muscle spindle cell activity. This has the ability to feed central reflex activities, resulting in aberrant efferent neurological responses. These aberrant responses can cause an increased mucosity within the child's eustachian tube, creating congestion in the ET and the formation of otitis media.<sup>3</sup> The eustachian tube position in infants is nearly horizontal and slowly acquires a 45 degree angle by the time the child reaches seven years of age. The eustachian tube is also shorter and larger in diameter at infancy through early childhood, which could encourage the collection of microbes from the nasal pharynx.<sup>29</sup>

The normal anatomy of the child's ET paired with the neurological compensation due to vertebral subluxation makes for a prime environment for the condition of OME to manifest. Lymphatic flow can also be affected by hypertonic or hypotonic musculature, since it depends on muscular contraction, external body tissue compression and arterial pulsations. Therefore, if a child develops subluxation (fixation) of the cervical spine, this could lead to nerve irritation, causing cervical muscular hypertonicity and impeding lymph drainage away from the head.<sup>4</sup> Obstruction of the eustachian tube lymphatics has also been a proposed mechanism for producing otitis media with effusion.<sup>30</sup>

### Conclusion

The author has presented a case report of a three year old girl with chronic recurrent otitis media with effusion who underwent chiropractic case management, including specific

upper cervical adjusting and dietary recommendations. This patient had an excellent outcome with no residual complications. Several theories of the effects of spinal adjusting are discussed in relation to the patient's chief complaint. Additional, large scale experimental studies such as randomized clinical controlled trials, are warranted in order to make generalizations to other patients as to positive outcomes of OME with chiropractic management. The current complications associated with common forms of allopathic treatment for otitis media with effusion, paired with the high incidence and prevalence of the condition in U.S. children further necessitates the evaluation of a more conservative approach to the case management of this condition.

For the most part it appears that pediatricians and ENT's do not recommend or discuss conservative treatment options, such as chiropractic care, with their patients for the management or co-management of OME. In a study of parents already treating their child with alternative medicine, 81% of the parents stated they would have preferred to discuss it with their pediatrician, although only 36% reported having done so.<sup>31</sup> It is our hope that these case reports and the literature showing the efficacy of chiropractic for OME may influence pediatricians to form a bridge of communication and co-management for these children.

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I would like to thank Dr. Matthew McCoy, for inspiring me to document positive cases, research literature and supply a positive, scientific, evidence base to support the chiropractic profession and give further value, validity and understanding to the many benefits of the chiropractic adjustment. Thanks to the mother that made the choice to give chiropractic care for her daughter a try, which in turn allowed her daughter to experience the gift of a better quality of life. Thanks to the office staff at Franks Chiropractic Life Center, and Drs Chris Brooks and Jami Gomarko who assisted in the preparation of this case study.

### References

1. Engel J, Anteunis L, Volovics A, Hendriks J, Marres E. Risk factors of otitis media with effusion during infancy. *Int J Pediatr Otorhinolaryngol* 1999;48:239-49.
2. Engel J, Anteunis L, Volovics A, Hendriks J, Marres E. Prevalence rates of otitis media with effusion from 0 to 2 years of age: healthy-born versus high-risk-born infants. *Int J Pediatr Otorhinolaryngol* 1999;47:243-51.
3. Fallon JM. The Role of the Chiropractic Adjustment in the Care and Treatment of 332 Children with Otitis Media. *J Clin Chiropractic Pediatr* 1997;2(2):167-83.
4. Fysh PN. Chronic Recurrent Otitis Media: Case Series of Five Patients with Recommendations for Case Management. *J Clin Chiropractic Pediatr* 1996;1(2):66-78.
5. Griffith S, Levine S, Giebink GS. Management of otitis media using Agency for Health Care Policy and Research guidelines. *Otolaryngol Head Neck Surg* 1998;118(4):437-43.
6. Sawyer CE, Evans RL, Boline PD, Branson R, Spicer

- A. A Feasibility Study of Chiropractic Spinal Manipulation Versus Sham Spinal Manipulation for Chronic Otitis Media with Effusion in Children. *J Manipulative Physiol Ther* 1999;22(5):292-8.
7. Crouteau N, Vu H, Pless B, Infante-Rivard C. Trends in medical visits and surgery for otitis media among children. *Am J Dis Child* 1990;144:535-8.
  8. Eden AN, Fireman P, Stool S. The rise of acute otitis media. *Patient Care* 1995;15:22-51.
  9. Stool SE, Berg AO, Carney CJ, Cooley JR, Culpepper L, Eavey RD et al. Otitis media with effusion in young children. Clinical practice guideline technical report no. 12. AHCPR publication no. 94-0622. Rockville Md: Agency for Health Care Policy and Research, Public Health Service, U.S. Department of Health and Human Services. 1994; July:192-208.
  10. Lous J. Which children would benefit most from tympanostomy tubes (grommets)? A personal evidence-based review. *Int J Pediatr Otorhinolaryngol* 2008;72:731-6.
  11. DeBeer B, Schilder AGM, Ingels K, Snik AF, Zielhuis GA, Graamans K. Hearing loss in young adults who had ventilation tube insertion in childhood. *Ann Otol Rhinol Laryngol* 2004;113:438-44.
  - ▶ 12. Ruben RJ, Wallace IF, Gravel J. Long term communication deficiencies in children with otitis media during their first years of life. *Acta Otolaryngol* 1997;117:206-7.
  13. Zollman C, Vickers A. What is complementary medicine? *BMJ* 1999;19:393-6.
  14. American Speech-Language Hearing Association. (2004). Guidelines for the Audiologic Assessment of Children From Birth to 5 Years of Age [Guidelines]. Available from [www.asha.org/policy](http://www.asha.org/policy).
  15. American Academy of Family Physicians, American Academy of Otolaryngology-Head and Neck Surgery, and American Academy of Pediatrics Subcommittee on Otitis Media with Effusion. (2004) Clinical Practice Guideline: Otitis Media with Effusion [Guidelines]. Available from [www.aafp.org](http://www.aafp.org).
  16. Onusko E. Tympanometry. *Am Fam Physician*. 2004;70(9):1713-20.
  17. Gates GA. Cost-effectiveness considerations in otitis media treatment. *Otolaryngol Head Neck Surg* 1996;114:525-30.
  18. Gates GA, Avery C, Prihoda TJ, Holt GR. Post tympanostomy otorrhea. *Laryngoscope* 1986;96:630-4.
  19. Kilby D, Richards SH, Hart G. Grommets and glue ears: two-year results. *J Laryngol Otol* 1972; 86:881-8.
  20. Maw AR. Development of tympanosclerosis in children with otitis media with effusion and ventilation tubes. *J Laryngol Otol* 1991;105:614-7.
  21. Kleinman LC, Kosecoff J, Dubois RW, Brook RH. The medical appropriateness of tympanostomy tubes proposed for children younger than 16 years in the United States. *JAMA* 1994;271:1250-5.
  22. Rosenfeld RM, Culpepper L, Doyle KJ, Grundfast KM, Hoberman A, Kenna MA, et al. Clinical practice guideline: otitis media with effusion. *Otolaryngol Head Neck Surg* 2004;S95-S118.
  23. Vallone S, Fallon JM. Treatment Protocols for the Chiropractic Care of Common Pediatric Conditions: Otitis Media and Asthma. *J Clin Chiropractic Pediatr* 1997;2(1):113-15.
  24. Froehle RM. Ear Infection: A Retrospective Study Examining Improvement from Chiropractic Care and Analyzing for Influencing Factors. *J Manipulative Physiol Ther* 1996;19(3):169-77.
  25. Lamm L, Ginter L. Otitis Media: A Conservative Chiropractic Management Protocol. *Top Clin Chiro* 1998;5(1):18-28.
  26. Prax JC. Upper Cervical Chiropractic Care of the Pediatric Patient: A Review of the Literature. *J Clin Chiropractic Pediatr* 1999;4(1):257-63.
  27. Saunders L. Chiropractic treatment of otitis media with effusion: a case report and literature review of the epidemiological risk factors that predispose towards the condition and that influence the outcome of chiropractic treatment. *Clin Chiropractic* 2004;7:168-73.
  28. Zhang JQ, Snyder BJ. Effect of the Toftness Chiropractic Adjustments for Children with Acute Otitis Media. *J Vertebral Sublux Res* 2004;1-4.
  29. McMullen M. Education and Clinical Pediatric Care. *J Clin Chiropractic Pediatr* 1996;1(1):9-17.
  30. Pulek JL, Horwitz MJ. Diseases of the Eustachian Tube. *Otolaryngol* 1972;75-92.
  31. Breuner CC. Complementary Medicine in Pediatrics: A Review of Acupuncture, Homeopathy, Massage, and Chiropractic Therapies. *Curr Probl Pediatr Adolesc Health Care* 2002;353-84.

Figure 1

ENT Audiology report prior to the initiation of chiropractic co-management

### Audiological Evaluation

Patient \_\_\_\_\_  
 Date 4/14/08 AGE 3 D.O.B. \_\_\_\_\_  
 Examiner \_\_\_\_\_

Response Consistency: Good Moderate Poor  
 No Response \_\_\_\_\_  
 Best Bone \_\_\_\_\_  
 Sound Field S  
 Aided \_\_\_\_\_  
 Sound Field \_\_\_\_\_

<input type="checkbox"/>	Narrow Band Noise
<input checked="" type="checkbox"/>	Warble Tone

GSI - 61 Audiometer  
 GSI Tympanometer

Insert Ear Phones  
 Head Phones

PURE TONE AUDIOGRAM  
FREQUENCY IN HERTZ

#### SPEECH AUDIOMETRY

	RIGHT	LEFT	MASK LEVEL R L	SOUND FIELD	LIST
SAT					
SRT	30	20			
MCL					
UCL					
PB % (Word)					
PB % (Word)					

#### IMMITANCE AUDIOMETRY

	TYMP TYPE	STATIC COMP.	CANAL VOLUME	PRESS.
RIGHT	B	NP	0.4	NP
LEFT	As	8.1	7.4	-90

**REMARKS:** Tympanometry revealed Type B, AD and Type As, AS  
 SRTs were reduced, AS and in the Mild HL range. AD w/ pt repeating sporadic words  
 Acuity: WNL from 500Hz - 4KHz when presented in soundfield  
 Rec: Repeat audio once ME is clear

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Figure 2

ENT audiology report after 14 visits to the chiropractor

### Audiological Evaluation

Patient \_\_\_\_\_ Response Consistency Good Moderate Poor

Date 6/3/09 AGE 3 D.O.B. \_\_\_\_\_

Examiner \_\_\_\_\_

No Response \_\_\_\_\_  
 Best Bone \_\_\_\_\_  
 Sound Field \_\_\_\_\_  
 Aided \_\_\_\_\_  
 Sound Field \_\_\_\_\_

Narrow Band Noise
Warble Tone

GSI - 61 Audiometer  Insert Ear Phones  
 GSI Tymstar Tympanometer  Head Phones *+ speech only*

**LEGEND**

	Right (red)	Left (blue)
AIR: UNMASKED	○	⊗
MASKED	△	⊠
BONE: UNMASKED	◁	▷
MASKED	◻	◻

PURE TONE AUDIOGRAM  
FREQUENCY in HERTZ

HEARING LEVEL IN DECIBELS (BY ANSI 1982)

**SPEECH AUDIOMETRY**

	RIGHT	LEFT	MASK LEVEL R	MASK LEVEL L	SOUND FIELD	LIST
SAT						
SRT		15 15				
MCL						
UCL						
PB % (Word)						
PB % (Word)						

**IMMITANCE AUDIOMETRY**

	TYMP TYPE	STATIC COMP.	CANAL VOLUME	PRESS.
RIGHT	A5	0.2	0.6	30
LEFT	A5	0.2	0.5	5

*\* Pt. has been seeing Chiropractor and reports improvement*

**REMARKS:** Tympanometry revealed Type As, All  
Repeated SRTs and obtained UCL, All  
with patient repeating spondee words  
Improved noted since 4/14/09  
See plain audiometry from 4/14/09

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