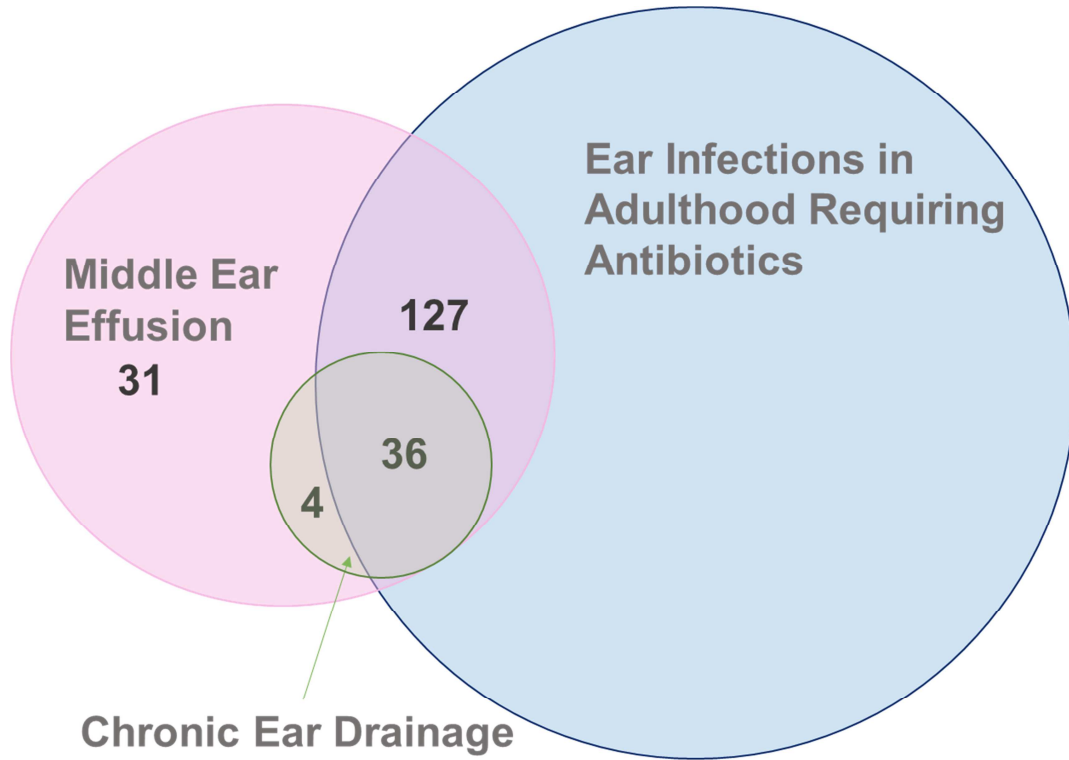
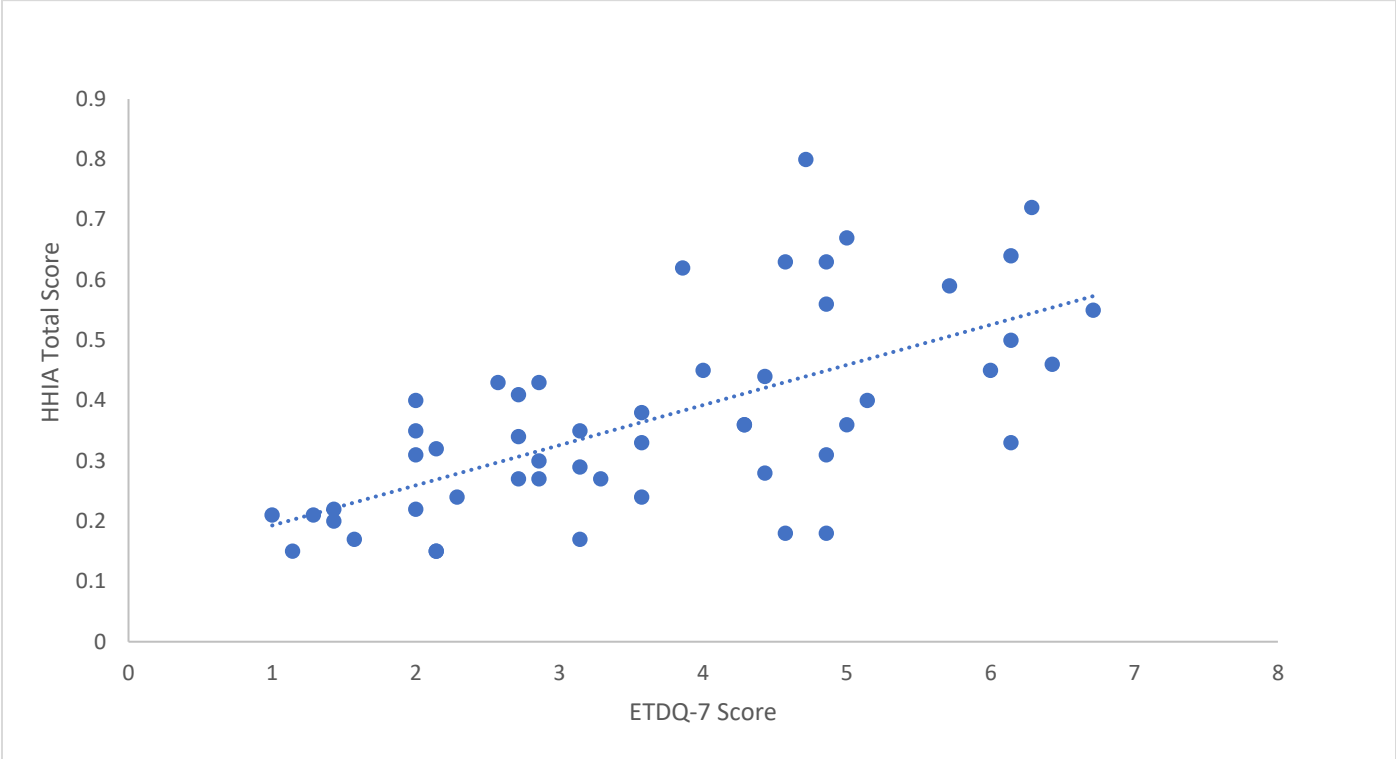


Supplemental Figure 2: Overlap among reported middle ear symptoms



Supplemental Figure 3: Linear Relationship between ETDQ-7 and HHIA Total Score among patients with hearing loss in AERD



Supplemental Figure 3 Legend: Eustachian Tube Dysfunction 7 (ETDQ-7) questionnaire demonstrates a linear relationship with the Hearing Handicap Inventory for Adults (HHIA) total score among AERD patients with hearing loss, with Pearson's correlation coefficient 0.66 ($p < .0001$).

Supplemental Table 1: ETDQ-7 and HHIA Survey Results

Demographics		
Total Respondents	74 (28.4%)	
Prior congenital/traumatic hearing loss or loud noise exposure	22	
Total respondents analyzed	52	
Males	15 (28.8%)	
Females	37 (71.1%)	
Age		
Mean	53.7 ± 1.9	
Range	22-75 years	
Age at Diagnosis of Asthma, years	31.2 ± 2.5	
Age at Diagnosis of Nasal Polyps, years	37.1 ± 2.3	
Number of Lifetime Polypectomies	2.8 ± 0.4	
ETDQ-7 Results		
Mean Score	3.66 ± 0.22	
Males	3.29 ± 0.44	p=0.28
Females	3.81 ± 0.25	
Score by Age Group	ANOVA p value = .0634	
<40 years	4.95 ± 0.58	
40-49 years	3.04 ± 0.32	
50-59 years	4.20 ± 0.64	
60-69 years	3.47 ± 0.36	
>70 years	3.28 ± 0.52	
HHIA Results		
Total Mean Score	.37 ± .02	
Males	.38 ± .02	p=0.37
Females	.34 ± .05	
Emotional Domain Mean Score	.39 ± .02	
Social Domain Mean Score	.34 ± .02	
HHIA Total Score by Age Group	ANOVA p value = 0.012	t-test p-value
<40 years	0.56 ± 0.06	
40-49 years	0.32 ± 0.03	<0.001
50-59 years	0.38 ± 0.06	0.056
60-69 years	0.34 ± 0.05	<0.01
>70 years	0.34 ± 0.04	<0.01
HHIA Emotional Score by Age Group	ANOVA p value= 0.016	t-test p-value
<40 years	0.59 ± 0.07	
40-49 years	0.33 ± 0.04	<0.001
50-59 years	0.42 ± 0.07	0.09
60-69 years	0.36 ± 0.04	<0.01
>70 years	0.37 ± 0.05	<0.01
HHIA Social Score by Age Group	ANOVA p value= 0.028	t-test p-value
<40 years	0.52 ± 0.08	
40-49 years	0.30 ± 0.04	0.007
50-59 years	0.33 ± 0.05	0.04
60-69 years	0.32 ± 0.04	0.02
>70 years	0.31 ± 0.03	0.01

Mean values +/- standard error are reported. Hearing Handicap Inventory for Adults – HHIA. Eustachian Tube Dysfunction 7 questionnaire -ETDQ-7.

Supplemental Figure Legends:

Figure E1 Legend: Questionnaires used to ascertain presence of hearing loss, middle ear symptoms, eustachian tube dysfunction and impact of hearing loss on quality of life.

Figure E2 Legend: Venn diagram demonstrating significant overlap in the middle ear symptoms reported by Survey 1 Respondents. All respondents with chronic ear drainage also had either middle ear effusion or both middle ear effusion and ear infections in adulthood requiring antibiotics.

Figure E3 Legend: Eustachian Tube Dysfunction 7 (ETDQ-7) questionnaire demonstrates a linear relationship with the Hearing Handicap Inventory for Adults (HHIA) total score among AERD patients with hearing loss, with Pearson's correlation coefficient 0.66 ($p < .0001$)

Supplemental Figure 1: Otologic manifestations survey

Have you ever been evaluated for hearing loss? Yes/No

Have you ever been diagnosed with hearing loss? Yes/No

If yes, when? _____

Right ear only? Yes/No

Left ear only? Yes/No

Both? Yes/No

What treatment have you received for your hearing loss? _____

Do you have a family history of hearing loss? Yes/No

Have you experienced vertigo (sensation that the room is spinning)? Yes/No

Do you have a history of loud noise exposure in your profession or from hobbies (manufacturing facility, rock music concerts, etc)? Yes/No

Were you born prematurely (before 37 weeks of gestation)? Yes/No

Have you experienced any prior head trauma? Yes/No

Have you been diagnosed with fluid in your ears as an adult? Yes/No

Have you ever required an incision in your ear drum (myringotomy) to drain fluid as an adult? Yes/No

If yes, when? _____

Right ear only? Yes/No

Left ear only? Yes/No

Both? Yes/No

Have you had ear tubes placed in adulthood? Yes/No

If yes, when? _____

Right ear only? Yes/No

Left ear only? Yes/No

Both? Yes/No

Have you suffered from chronic ear drainage? Yes/No

If yes, when did the chronic ear drainage start? _____

Have any treatments helped your chronic ear drainage condition? _____

What treatments have been tried and were not helpful? _____

Have you received oral antibiotics to treat a middle ear infection in adulthood? Yes/No

If yes, how many times per year on average?

less than 1 per year Yes/No

1-2 per year Yes/No

more than 3 per year Yes/No

Have you been diagnosed with polyps in your ears or on your ear drum? Yes/No

Do you have any other difficulties with your hearing or ears to report? _____

Those subjects reporting a diagnosis of hearing loss were also asked to complete the following:

1) Was your hearing loss confirmed by an audiologist or through audiologic testing? Yes/No

If no, would you be interested in having a full audiologic evaluation at BWH? Yes/No

If yes, do you have records or documentation of your audiologic evaluation? Yes/No

If yes, please upload any pertinent medical records or have them faxed.

2) The 7-item Eustachian Tube Dysfunction Questionnaire (ETDQ-7) as reported by McCoul E.D., Anand V.K., & Christos P.J. Validating the Clinical Assessment of Eustachian Tube Dysfunction: The Euctachian Tube Dysfunction Questionnaire (ETDQ-7). *Laryngoscope*. 2012 May;122(5):1137-141.

3) The Hearing Handicap Inventory Adults as reported by Newman, C. W., Weinstein, B. E., Jacobson, G. P., & Hug, G. A. The Hearing Handicap Inventory for Adults: psychometric adequacy and audiometric correlates. *Ear and Hearing*. 1990;11:430-433.