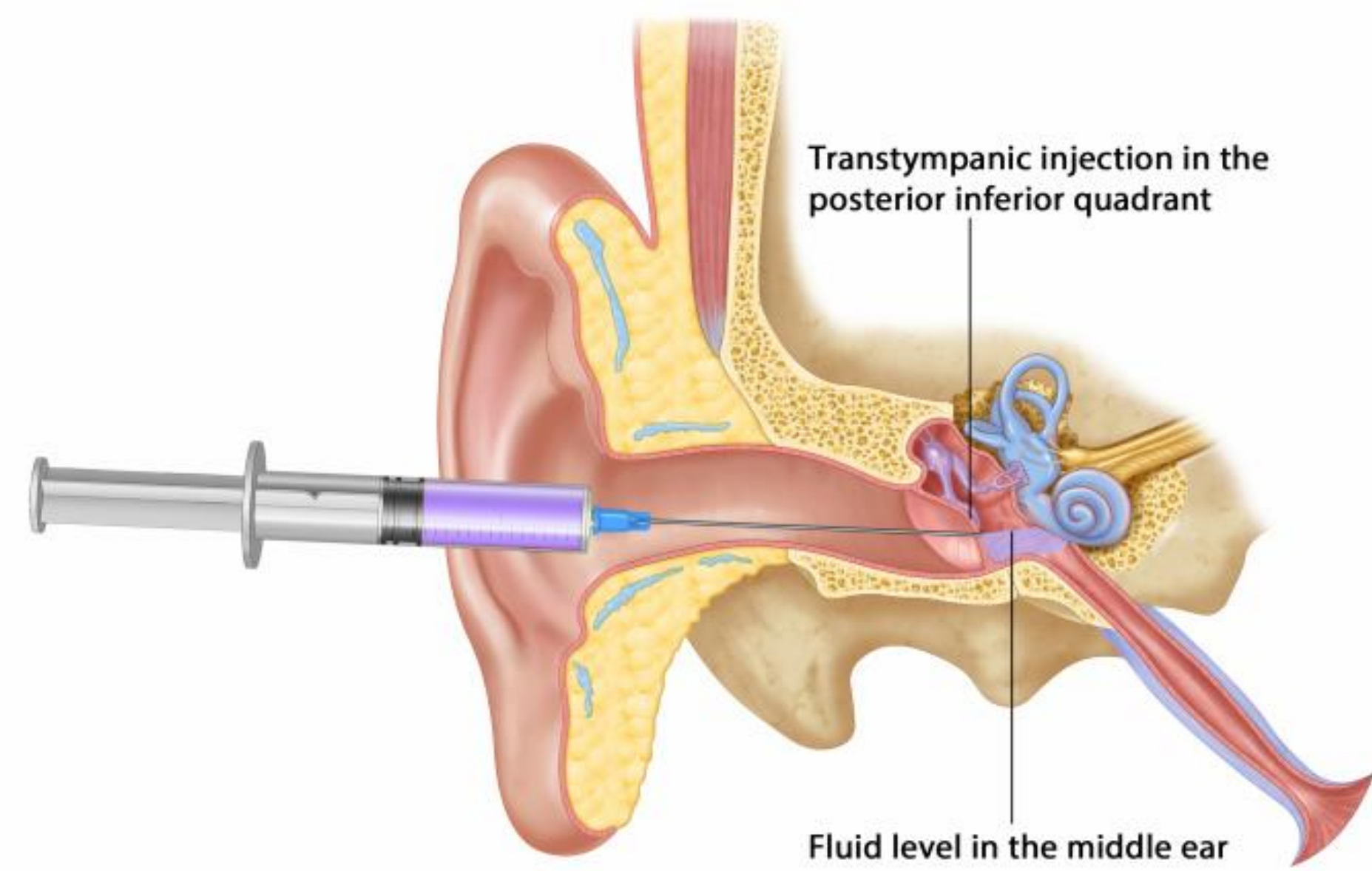


## Introduction

- ❖ ITS is a routine treatment for patients with Meniere's disease, sudden sensorineural hearing loss (SSNHL), refractory tinnitus, and autoimmune inner ear disease (AIED).
- ❖ Despite wide use, there's no consensus on timing, dose, and side effects of ITS.
- ❖ Additionally, patients with other otologic disorders or peripheral vestibulopathies are provided few interventional opportunities.



## Aims

1. Characterize the use of ITS injections at UF and determine the efficacy and safety of its use across multiple clinical indications.
2. Identify which clinical features correlate with treatment response.
3. Identify trends in self-reported improvement of vertigo or hearing loss and comparative audiogram data and electronystagmography results.

## Methods

### Inclusion criteria:

- Patients treated at UF Health with an ITS injection
  - aged 18-100
  - between January 1, 2018 to March 3/21/2022

### Exclusion criteria:

- History of:
  - Previous ear surgery
  - Previous gentamycin injection
  - Preceding temporal bone trauma

### Patients were stratified based on pre-injection diagnosis:

- Meniere's disease (N=46)
- AIED (N=8)
- SSNHL (N=52)
- Other ENG-proven vestibulopathy (N=35)

### Data collected includes:

- Patient demographics
- Audiograms and ENG results
- ITS injection specifics
- Time until treatment failure
- Subjective improvement

## Patient Demographics and Duration of Symptoms Prior to Injection

Variable	N (%) or Median [IQR]
<b>Sex</b>	
Female	72 (50.7%)
Male	67 (47.2%)
Not reported	2 (1.4%)
<b>Age at Diagnosis</b>	65 [53-72]
<b>Ethnicity</b>	
White	113 (79.6%)
Black	9 (6.3%)
Asian	5 (3.5%)
Hispanic	8 (5.6%)
Other	2 (1.4%)
Not reported	4 (2.8%)
<b>Past Otolaryngology History</b>	
None	55 (39.0%)
Tinnitus	51 (36.2%)
Meniere's	37 (26.2%)
Atelectasis	2 (1.4%)
Cholesteatoma	1 (0.7%)
Otosclerosis	1 (0.7%)
Multiple <sup>1</sup>	6 <sup>1</sup>
<b>Pre-injection Diagnosis</b>	
SSNHL	52 (36.9%)
Meniere's	46 (32.6%)
AIED	8 (5.7%)
Other Vestibulopathy <sup>2</sup>	35 (24.8%)

<sup>1</sup> Six patients had multiple past otolaryngology history. The patients' history included: Tinnitus and Meniere's Disease (N=5) and Meniere's Disease and Cholesteatoma (N=1)  
<sup>2</sup> 35 patients were combined into "Other Vestibulopathy" with pre-injection diagnoses of one of the following: BPPV (N=2), Vestibular Neuronitis (N=2), Labyrinthitis (N=2), Tinnitus (N=7), ENG-proven vestibulopathy (N=22)

Figure 1: Patient's Presenting Symptom Stratified by Pre-Injection Diagnosis

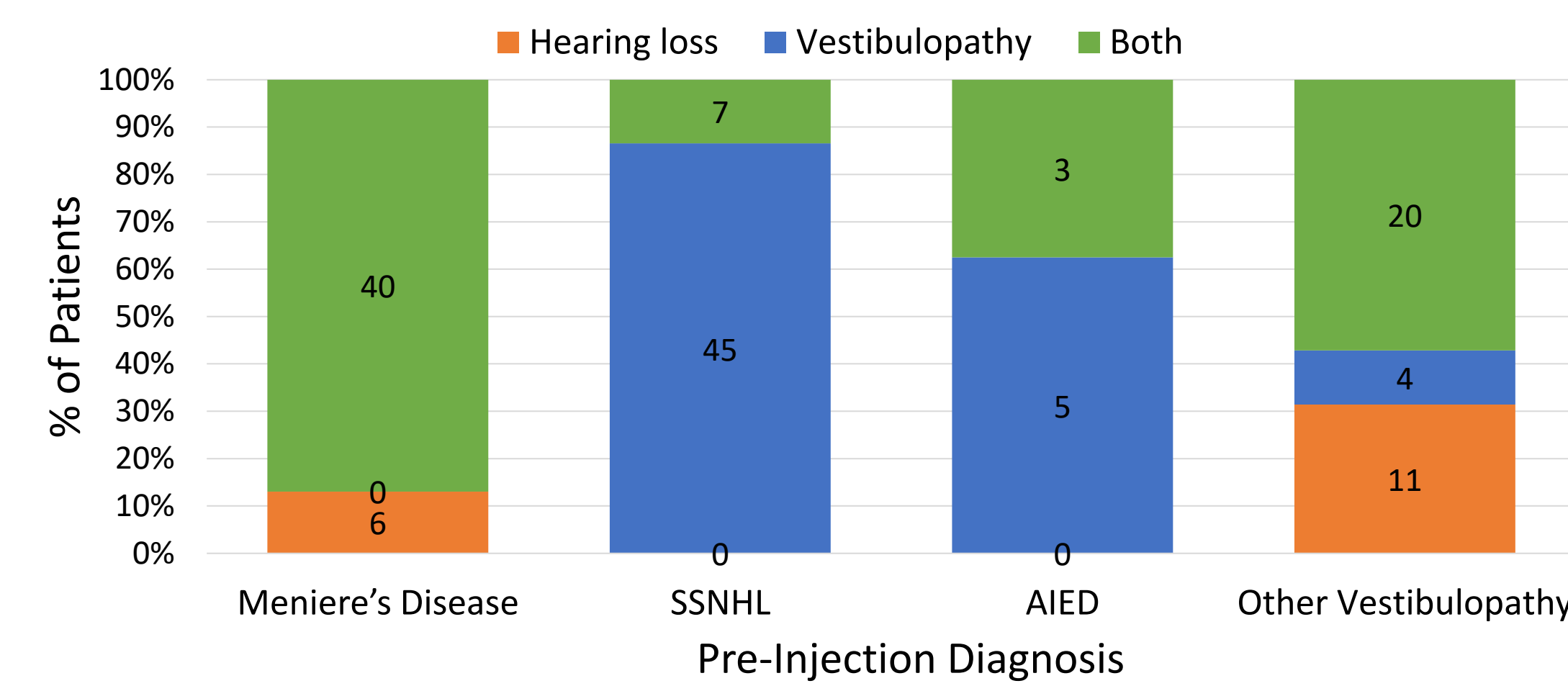
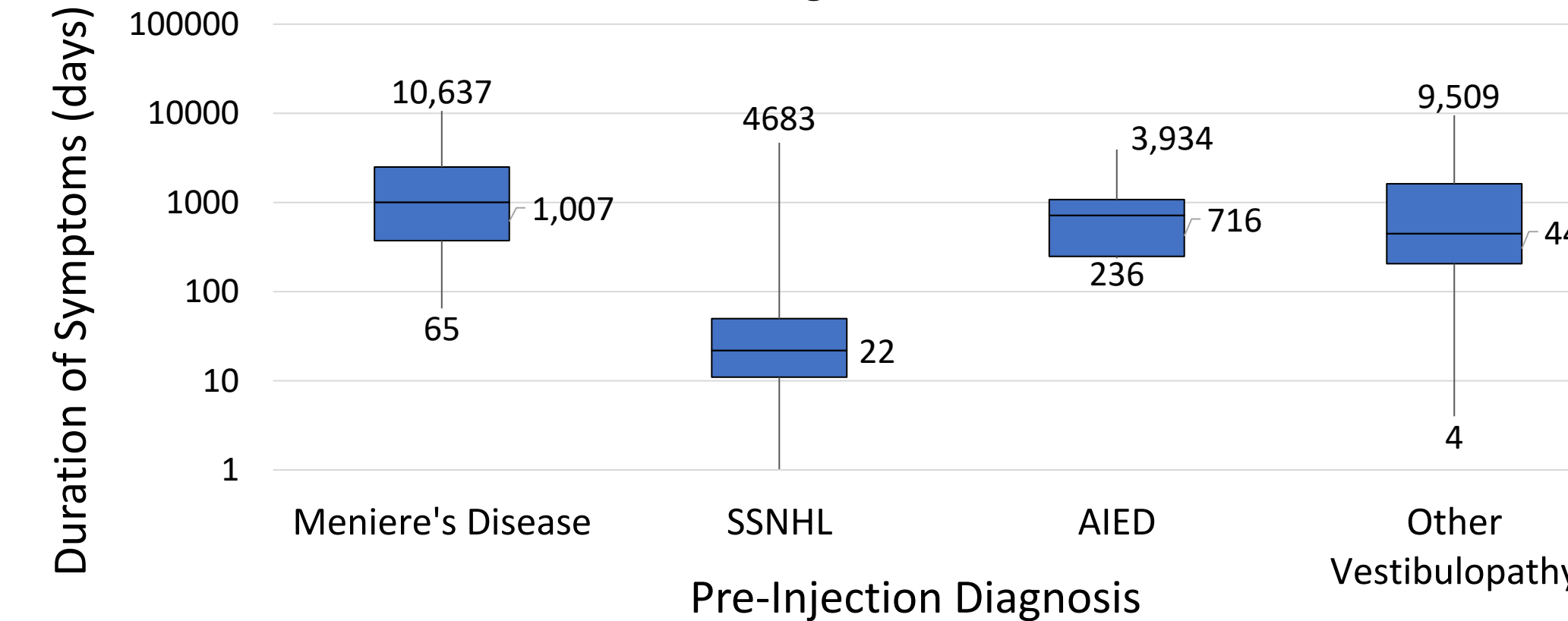
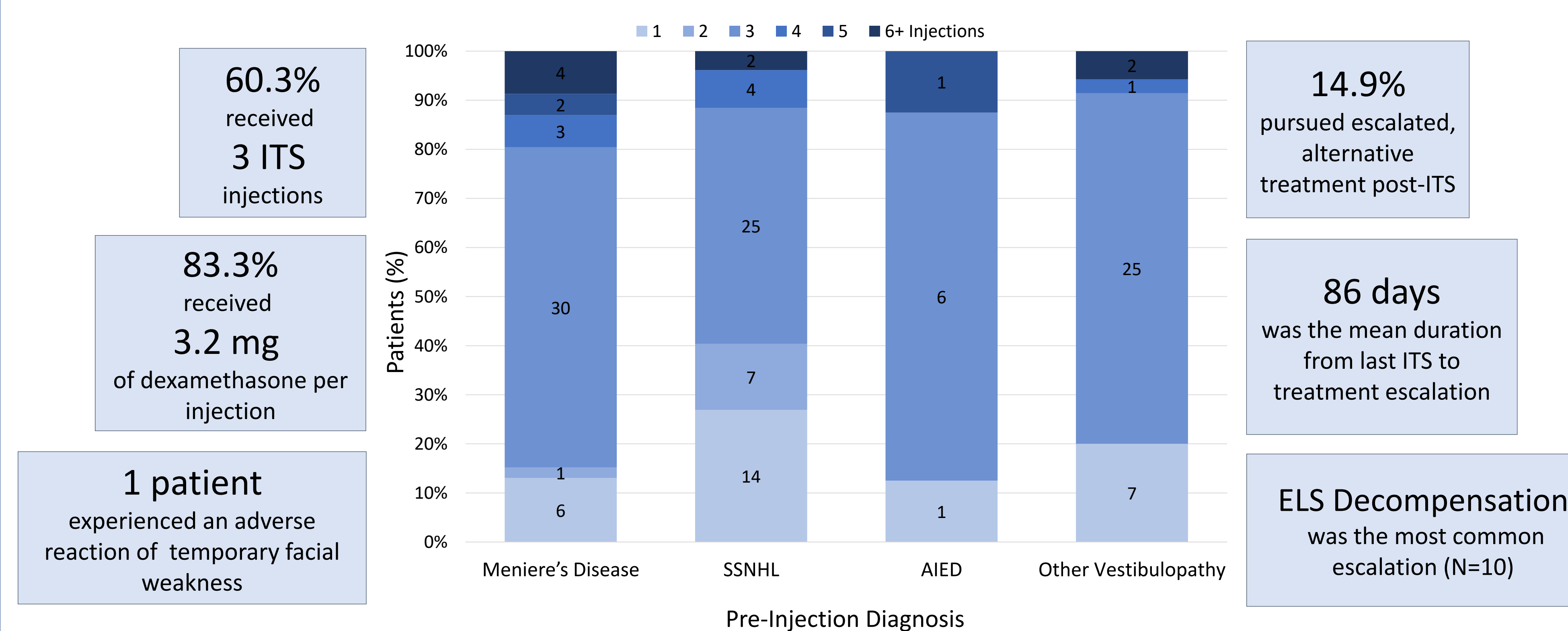


Figure 2: Duration of Symptoms Prior to First Injection Stratified by Pre-Injection Diagnosis



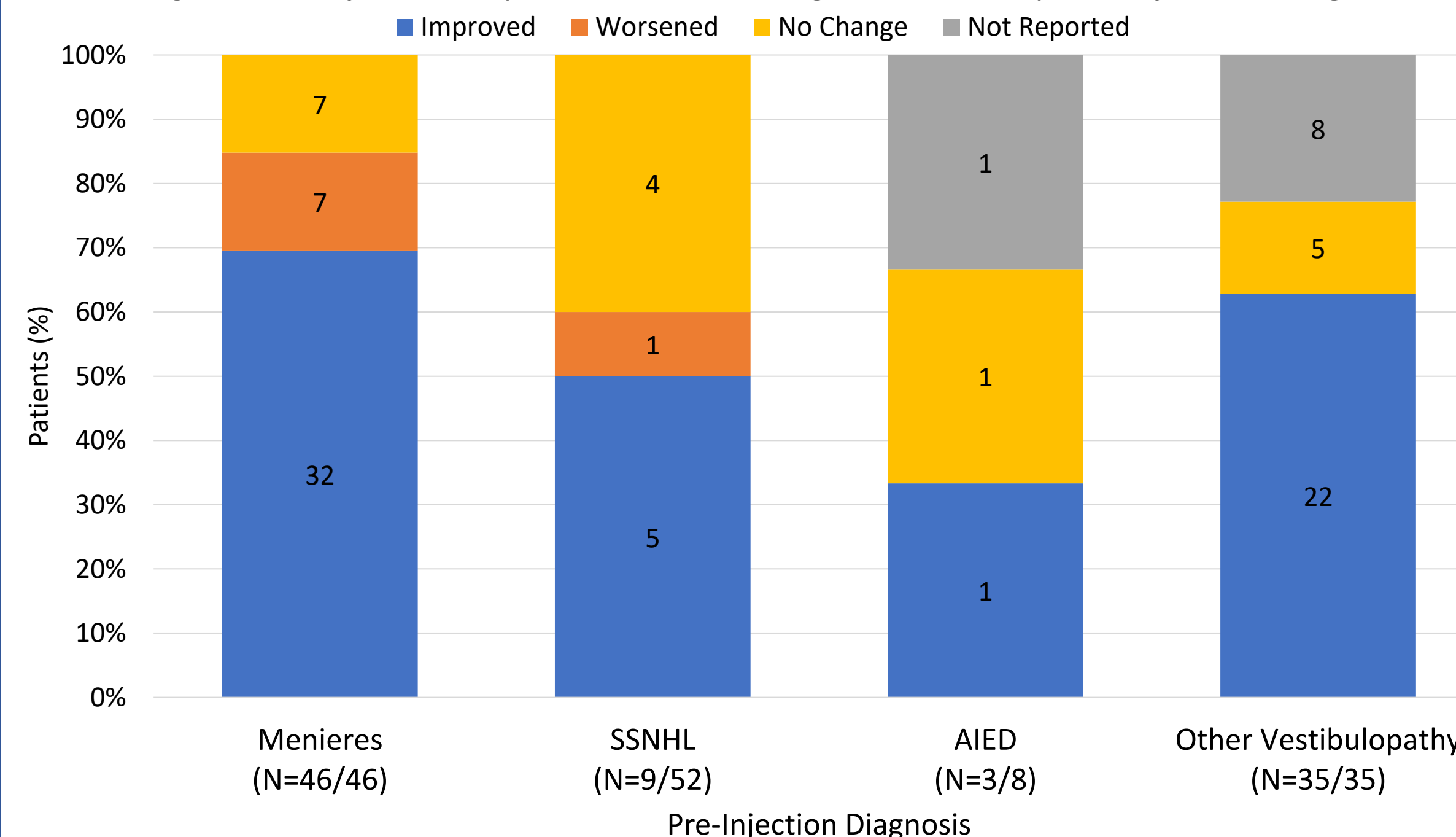
## ITS Injection Data and Safety Outcomes

Figure 3: Number of ITS Injections Per Patient Stratified by Pre-Injection Diagnosis



## Subjective Improvement in Vertigo

Figure 4: Subjective Improvement of Vertigo Stratified by Pre-Injection Diagnosis



➤ The subjective improvement of vertigo did not differ between patients who received 3 ITS injections and did not receive 3 ITS injections.  
 $\chi^2 (2, N = 85) = 4.3, p > 0.05.$

➤ The subjective improvement of vertigo did not differ between Meniere's and other vestibulopathy patients.  
 $\chi^2 (2, N = 73) = 4.5, p > 0.05.$

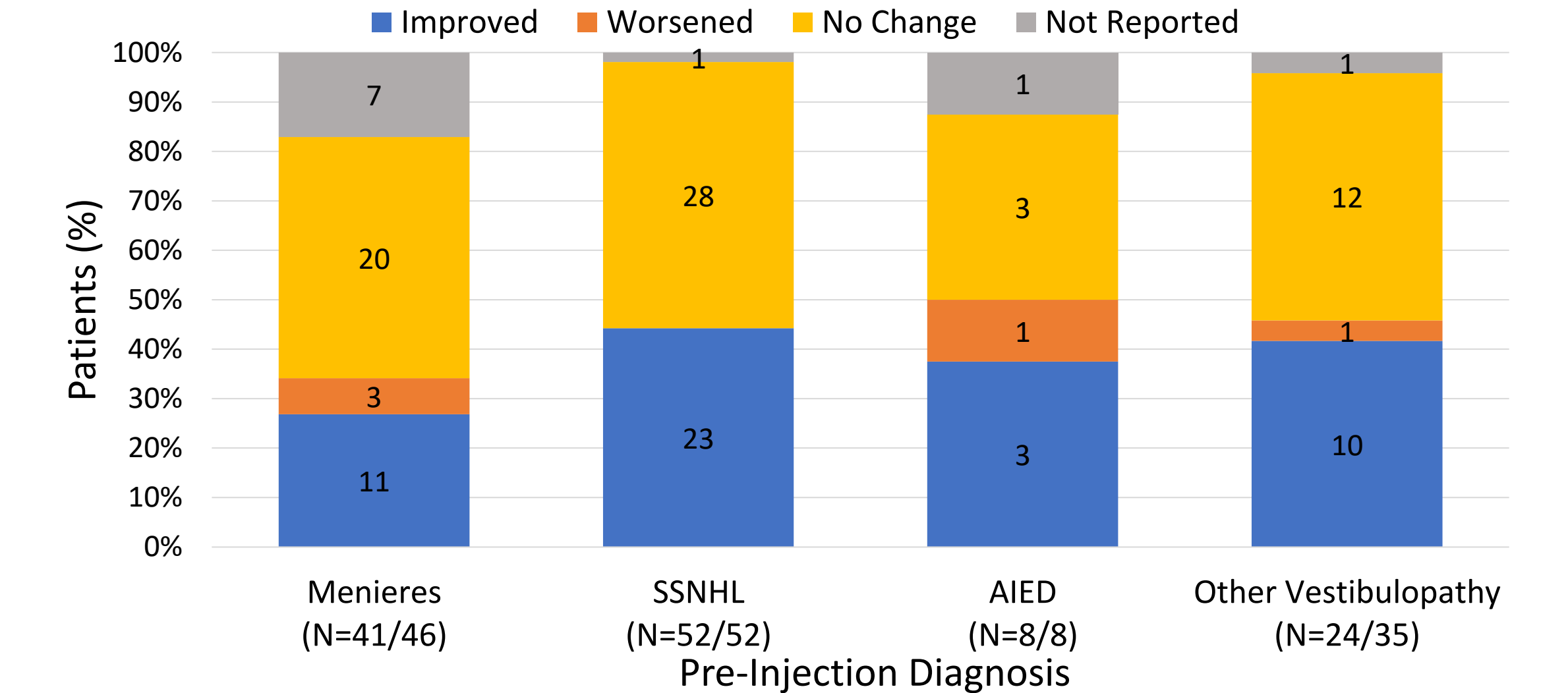
➤ The subjective improvement of vertigo did not differ between SSNHL and other vestibulopathy patients.  
 $\chi^2 (2, N = 74) = 2.2, p > 0.05.$

## Clinical Features and Treatment Success

- The subjective improvement of vertigo did not differ between other vestibulopathy patients presenting with only vestibulopathy versus vestibulopathy and hearing loss together,  $\chi^2 (1, N = 27) = 0.11, p > 0.05.$
- There was no statistical difference in duration of symptoms prior to ITS injection and subjective improvement of vertigo for other vestibulopathy patients. ( $p=0.84, t$ -test)
- There was no statistical difference in patient's percent caloric weakness and subjective improvement of vertigo for other vestibulopathy patients. ( $p=0.49, t$ -test)

## Subjective and Objective Hearing Outcomes

Figure 5: Subjective Improvement of Hearing Stratified by Pre-Injection Diagnosis



## Conclusions

- ❖ Otolaryngologists should consider ITS injections for patients with peripheral vestibulopathy.
  - This population's improvement of vertigo and hearing loss is comparable to patients with Meniere's, AIED, and SSNHL.
  - A significant percentage of this population had no other prior treatment.
  - There were little to no side effects with this therapy.
- ❖ A prospective, multicenter, clinical trial is needed to further identify prognostic factors for symptom improvement post-ITS.
  - Percentage of caloric weakness did not correlate to post-ITS subjective improvement of vertigo.
  - Duration of symptoms, prior treatments, and sudden hearing loss did not correlate to subjective improvement of vertigo post-ITS.
- ❖ Objective and subjective measures of hearing improvement collected retrospectively can be contradictory.

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