

# Rates and predictors of follow-up loss after radiosurgery for sporadic vestibular schwannomas

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## Introduction

Stereotactic radiosurgery (SRS) is a cornerstone of vestibular schwannoma (VS) treatment with tumor control rates of over 90% on long-term follow-up. After treatment however, patients must be followed with serial imaging to assess for progression given that most tumors remain present on imaging. This study evaluated patient adherence to imaging surveillance after SRS for VS.

## Methods

Patients from 2005 to 2017 with sporadic VS treated initially with SRS were included, clinical data was retrospectively reviewed, and the US Census Bureau was queried for demographic data based on patients' zip codes. Outcomes of interest included 1) follow-up loss unrelated to death and prior to any salvage therapy and 2) inconsistent adherence during the period of active follow-up. Followup loss was defined as patients who did not ever return for an MRI 2 years beyond the recommended time-period. Inconsistent imaging follow-up was defined as failure to undergo an MRI within 1 year of a recommended timeframe during the available follow-up period for review. 

 Table 3. Uni- and multi-variable Cox proportional hazards analysis

 for factors associated with time to follow-up loss

	Univariate		Multivariate	
	HR (95% CI)	p-value	HR (95% CI)	p-value
Age (unit by 10 yrs)	0.96 (0.81-1.16)	0.70		
Sex (M vs F)	1.31 (0.88-1.96)	0.19		
Race/Ethnicity (C vs Other)	0.41 (0.15-1.11)	0.08		
Tumor Volume (unit OR by 1 cm <sup>3</sup> )	1.14 (1.03-1.23)	0.004	1.11 (1.002-1.21)	0.027
Tumor Margin Dose (unit OR by	1.04 (0.75-1.44)	0.81		
1 Gy)				
Maximum Dose (unit OR by 1 Gy)	0.99 (0.84-1.15)	0.85		
Type 2 Diabetes	0.87 (0.48-1.55)	0.63		
Stroke	0.77 (0.37-1.60)	0.49		
<b>MI/CAD Requiring Intervention</b>	2.44 (1.44-4.12)	0.0009	2.14 (1.26-3.64)	0.005
BMI	0.98 (0.94-1.02)	0.38		
Active/Former Smoker	0.70 (0.45-1.10)	0.13		
Median Household Income (unit	0.93 (0.86-0.99)	0.045	0.94 (0.87-1.01)	0.09
OR by \$10,000)				
Total Population (unit OR by	1.00 (0.99-1.01)	0.85		
1000 people)				
Employment Rate (unit OR by	1.00 (0.98-1.03)	0.76		
1%)		0.00		
Location (Out of State vs in	0.91 (0.61-1.35)	0.63		
State)		0.59		
100 milos)	$1.02(0.90^{-1}.07)$	0.50		
Employment Status	1 07 (0 70-1 62)	0.75		
(Employed/Student vs				
Retired/Disabled/Unemployed)				

#### **Table 1. Patient and Treatment Factors**

Number of Patients	303	
Median Age (yrs, Range)	62.4 (18-88)	
Sex		
Female	153 (50.5%)	
Male	150 (49.5%)	
Race		
Caucasian	281 (92.7%)	
Asian/Pacific Islander	4 (1.3%)	
African American	1 (0.3%)	
Other	2 (0.7%)	
Declined to Report	15 (5%)	
Ethnicity		
Non-Hispanic/Latino	267 (88.1%)	
Hispanic/Latino	1 (0.3%)	
Declined to Report	35 (11.6%)	
Tumor Laterality		
Right	157 (51.8%)	
Left	146 (48.2%)	
Median Tumor Volume (cm <sup>3</sup> , Range)	0.85 (0.07-15)	
Median Margin Dose (Gy, Range)	12.5 (11-14)	
Isodose % to Margin (%, Range)	50 (40-60)	
Diabetes	43 (14.2%)	
Stroke History	29 (9.6%)	
History of MI/CAD requiring intervention	29 (9.6%)	
Active/Former Smoker	98 (32.3%)	
Median BMI (Range)	27.5 (14.4 – 58.9)	
Median Household Income (Range)	\$69,419.50 (range 23,012 – 225,119)	
Median Total Population (Range)	18.492 (15-86697)	
Employment Rate (Range)	64.8% (14.6-82.3%)	
Patient Home Location		
In-State	133 (43.9%)	
Out-of-State/International	170 (56.1%)	
Distance to Hospital from Home (U.S. Patients Only)	167.3 miles (0-1599)	
Employment Status		
Employed/Student	179 (61.1%)	
Retired/Disabled	99 (33.8%)	
Unemployed	15 (5.1%)	



### Table 2. Follow-up Loss and Inconsistent Imaging

Inconsistent Imaging During Follow-up	78 (25.7%)
Complete Follow-up Loss	97 (32.0%)
Median Follow-up Duration (mo, Range)	94.7 (0-204.5)
Censoring Event	
Last Imaging Follow-up	239 (78.9%)



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