

# Outcomes in surgical resection of sinonasal malignancy vary by age

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## Introduction

Sinonasal malignancies make up <5% of head and neck tumors and most commonly affect the maxillary sinus and nasal cavity. They present with nonspecific symptoms, variable histology, and potential for extension into the skull base or orbit. These tumors are typically treated via surgical resection with or without adjuvant radiotherapy. To our knowledge, this is the first study looking at the impact of age on post-operative outcomes of sinonasal malignancies.

## Methods and Materials

The TriNetX US Collaborative Network database was queried for patients undergoing surgical resection of sinonasal malignancy from 2004 to 2024. Patients were grouped in age cohorts (18-60, 61-80, 81+) and propensity score matched based on obesity status, hypertension, smoking status, heart failure, alcohol use, gender, and race. We measured surgical outcomes (CSF leak, meningitis, mortality, and epistaxis requiring nasal packing) and systemic outcomes (acute myocardial infarction, pulmonary embolism, and pneumonia) in patients who underwent surgical resection of a sinonasal malignancy. Outcomes were compared at 3 months, 6 months, and 1 year following procedure. Statistical analysis was performed using TriNetX.

## Results

In the 18-60 cohort, risk of CSF leak was increased when compared with the 81+ cohort at 3 months, 6 months, and 1 year. In the 61-80 cohort, there was an increased risk of CSF leak when compared with the 81+ cohort at 3 months, 6 months, and 1 year. We found a lower risk of epistaxis requiring nasal packing in the 61-80 cohort compared to the 81+ cohort at 3 months and 6 months. There was no significant change in risk of CSF leakage when comparing the 18-60 and 61-80 cohorts. Mortality was significantly increased in patients aged 81+ compared to 61-80 at 3 months, 6 months, and 1 year. There was no difference in systemic outcomes between cohorts.

## Conclusions

This multicenter cohort study found that risk of CSF leakage following resection of sinonasal malignancy doubled in patients aged 18-60 and patients aged 61-80 when compared to patients aged 81+ at multiple points of follow-up. Risk of epistaxis was higher in the 81+ cohort compared to the 61-80 cohort. In patients aged 81 or above, if surgery is determined to be the optimal treatment for the underlying sinonasal carcinoma, age should not prohibit surgical resection.

18-60 (n = 2073) vs 61-80 (n = 2073)			61-80 (n = 1609) vs 81+ (n = 1609)			18-60 (n = 1194) vs 81+ (n = 1194)		
Outcomes	OR(95% CI)	p-value	Outcomes	OR(95% CI)	p-value	Outcomes	OR(95% CI)	p-value
<b>CSF Leak</b>								
3 months	1.229 (0.896,1.685)	0.2	3 months	2.114 (1.317,3.393)	<b>0.002</b>	3 months	2.622 (1.590,4.322)	<b>&lt;0.0001</b>
6 months	1.242 (0.930,1.660)	0.141	6 months	2.301 (1.466,3.611)	<b>0.0002</b>	6 months	2.544 (1.601,4.043)	<b>&lt;0.0001</b>
1 year	1.219 (0.924,1.606)	0.16	1 year	2.385 (1.556,3.654)	<b>&lt;0.0001</b>	1 year	2.540 (1.636,3.942)	<b>&lt;0.0001</b>
<b>Infection</b>								
3 months	1.106 (0.593,2.064)	0.751	3 months	1.056 (0.552,2.020)	0.869	3 months	0.810 (0.388,1.692)	0.575
6 months	1.230 (0.698,2.167)	0.472	6 months	0.873 (0.484,1.575)	0.652	6 months	0.908 (0.493,1.672)	0.756
1 year	1.164 (0.717,1.889)	0.538	1 year	1.157 (0.681,1.965)	0.59	1 year	1.128 (0.647,1.966)	0.671
<b>Mortality</b>								
3 months	0.703 (0.435,1.136)	0.148	3 months	0.580 (0.399,0.845)	<b>0.004</b>	3 months	0.395 (0.244,0.639)	<b>&lt;0.0001</b>
6 months	0.727 (0.519,1.017)	0.062	6 months	0.590 (0.446,0.780)	<b>0.0002</b>	6 months	0.333 (0.229,0.484)	<b>&lt;0.0001</b>
1 year	0.942 (0.741,1.197)	0.624	1 year	0.581 (0.463,0.729)	<b>&lt;0.0001</b>	1 year	0.473 (0.361,0.621)	<b>&lt;0.0001</b>
<b>Epistaxis</b>								
3 months	1.233 (0.786,1.935)	0.36	3 months	0.494 (0.280,0.874)	<b>0.013</b>	3 months	1.256 (0.730,2.162)	0.409
6 months	1.282 (0.844,1.948)	0.244	6 months	0.584 (0.358,0.953)	<b>0.03</b>	6 months	1 (0.589,1.699)	1
1 year	1.236 (0.840,1.818)	0.281	1 year	0.685 (0.445,1.054)	0.084	1 year	1 (0.609,1.643)	1
<b>Acute MI</b>								
3 months	0.539 (0.274,1.061)	0.069	3 months	0.747 (0.422,1.320)	0.314	3 months	0.472 (0.221,1.006)	0.047
6 months	0.621 (0.354,1.090)	0.094	6 months	0.746 (0.451,1.234)	0.252	6 months	0.537 (0.272,1.059)	0.068
1 year	0.732 (0.435,1.231)	0.238	1 year	0.727 (0.451,1.170)	0.187	1 year	0.601 (0.327,1.105)	0.098
<b>PE</b>								
3 months	1.427 (0.791,2.574)	0.236	3 months	0.551 (0.292,1.040)	0.062	3 months	0.541 (0.266,1.098)	0.084
6 months	1.415 (0.861,2.326)	0.169	6 months	0.715 (0.416,1.227)	0.221	6 months	0.692 (0.363,1.316)	0.258
1 year	1.263 (0.825,1.931)	0.281	1 year	0.843 (0.527,1.347)	0.475	1 year	0.962 (0.558,1.659)	0.89
<b>Pneumonia</b>								
3 months	0.848 (0.554, 1.299)	0.448	3 months	0.837 (0.567,1.237)	0.372	3 months	0.772 (0.468,1.274)	0.311
6 months	0.786 (0.558,1.106)	0.166	6 months	0.956 (0.682,1.341)	0.796	6 months	0.766 (0.505,1.160)	0.207
1 year	0.862 (0.640,1.160)	0.326	1 year	0.830 (0.614,1.120)	0.222	1 year	0.707 (0.493,1.012)	0.057