

# Does the minimal important difference of the SNOT-22 differ based on sex, age, or baseline health for operatively-treated chronic rhinosinusitis patients?

C. Melina Albanese<sup>1</sup>, Arif Janjua<sup>2</sup>, Guiping Liu<sup>1</sup>, Jason Sutherland<sup>1</sup>

1. University of British Columbia, Centre for Health Services and Policy Research

2. Department of Surgery, Division of Otolaryngology – Head and Neck Surgery, The University of British Columbia

## Introduction

The 22-item Sino-Nasal Outcome Test (SNOT-22) is a patient-reported outcome (PRO) tool that is used to measure sino-nasal health and symptoms among patients with chronic rhinosinusitis (CRS). The minimal important difference (MID) is defined as the smallest change in PRO score perceived as meaningful to the patient. It has been reported that the MID of the SNOT-22 instrument total is approximately 9.0. Existing research has not reported whether MID values of the SNOT-22 in the context of ESS differ based on patient age, sex, or baseline health.

## Objectives

To quantify smallest amount of change in SNOT-22 scores that is perceived as “meaningful” from the patient perspective in different patient groups with CRS who are operatively treated.

## Methods

- Prospective recruitment of patients scheduled to undergo surgery for CRS
- Patients completed PROs, including the SNOT-22 and EQ-5D
- Participants who completed at least one domain of the SNOT-22 preoperatively were included
- MID values of the SNOT-22 instrument total and domain scores were calculated using two methods:

- Distribution-based approach = *effect size method*

$$\text{MID} = 0.5 \text{ SD}_{\text{BASELINE}}$$

- Anchor-based approach = *regression method*

$$\text{MID} = b_0 + b_1 * \text{anchor}$$

where anchor is the MID of EQ-5D in this population, estimated as  $0.5 \text{ SD}_{\text{BASELINE}}$ . Based on our sample, the anchor was taken as 0.7.

## Results

- The participation rate was 41% among eligible patients
- Mean age, age distribution, and preoperative SNOT-22 instrument total did not differ between male and female participants
- On average, patients’ health improved following surgery (Figure 1)
- Differences in MID values between sex and age subgroups were not observed (results not shown)
- Considering the overall cohort, the MID of the SNOT-22 instrument total was 10.75 using the effect-size method and 20.57 using the linear regression method (results not shown)
- There were differences in MID values based on patients’ preoperative sino-nasal health; the MID increased in magnitude with patients’ worsening symptoms (Table 2)

Table 1. Description of patient sample.

Characteristic	All (100%) n = 271	Sex		p value
		Female n = 127	Male n = 144	
EQ-5D utility value, mean (SD)	0.81 (0.14)	0.80 (0.14)	0.83 (0.14)	0.10
Age, mean (SD)	56.22 (13.33)	55.76 (13.03)	56.62 (13.62)	0.60
Age, n (%)				0.67
≤ 48	71 (26.2)	37 (29.1)	34 (23.6)	
49-58	69 (25.5)	30 (23.6)	39 (27.1)	
59-66	66 (24.4)	32 (25.2)	34 (23.6)	
≥ 67	65 (24.0)	28 (22.0)	37 (25.7)	
Preoperative SNOT-22 total score	n = 258	n = 123	n = 135	0.39

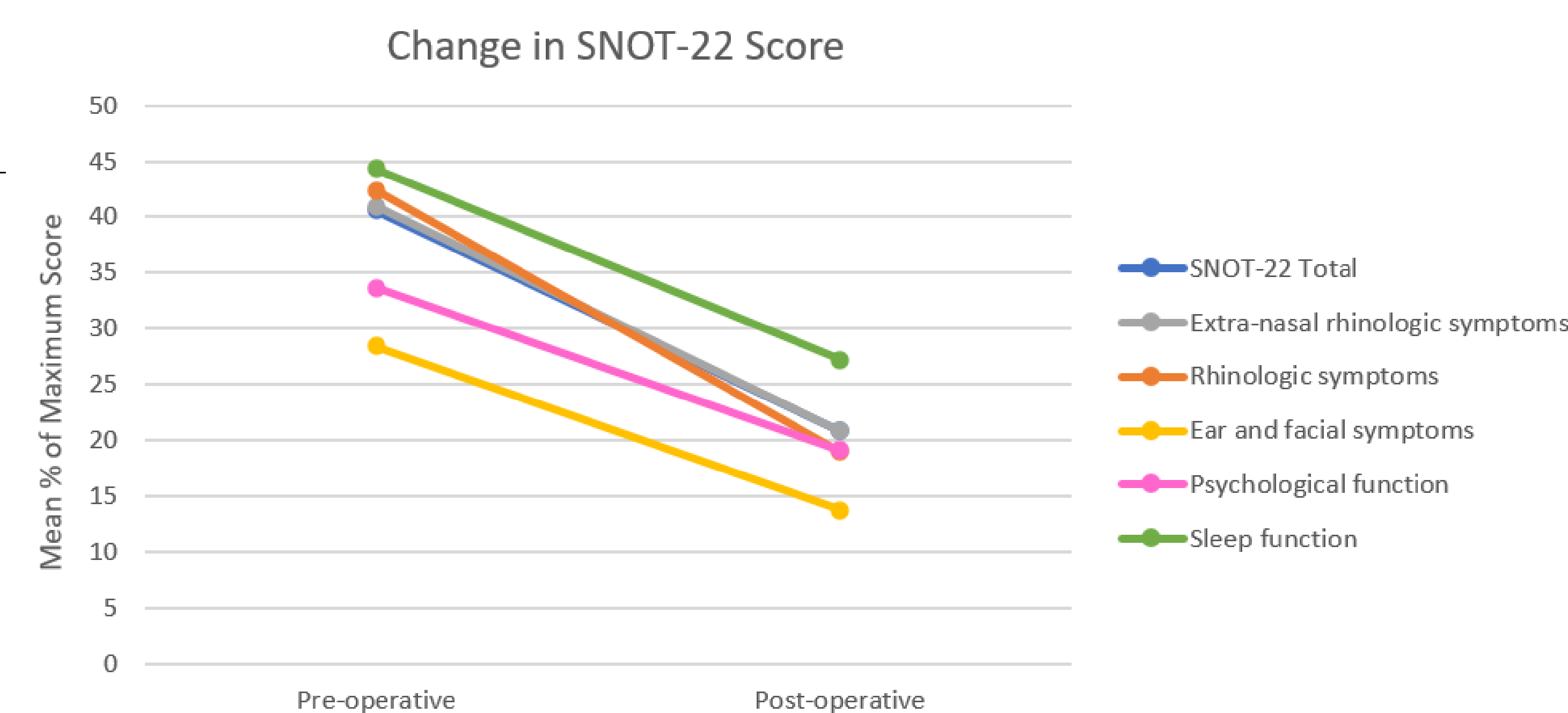


Figure 1. Changes in mean SNOT-22 domain and instrument total scores over the perioperative period. SNOT-22 scores are expressed as a % of the maximum possible value.

Table 2. MID (standard error) of the SNOT-22 total and domain scores, stratified by preoperative SNOT-22 total score.

SNOT-22 Domain	Score 0-24 (A)		Score 25-39 (B)		Score 40-55 (C)		Score 56-144 (D)		P-value
	n	MID (SE)	n	MID (SE)	n	MID (SE)	n	MID (SE)	
<b>Distribution-based approach</b>									
SNOT-22 total	69	3.05 (0.23)	66	2.41 (0.12)	62	2.39 (0.12)	61	5.39 (0.41)	< 0.01*
Rhinologic symptoms	69	2.13 (0.16)	66	2.28 (0.20)	62	2.35 (0.23)	61	2.42 (0.20)	0.74
Extra-nasal rhinologic symptoms	69	1.41 (0.11)	66	1.61 (0.11)	62	1.58 (0.13)	61	1.49 (0.13)	0.60
Ear and facial symptoms	69	1.21 (0.16)	66	1.58 (0.17)	62	1.85 (0.16)	61	2.23 (0.19)	< 0.01*
Psychological function	69	1.22 (0.13)	66	2.19 (0.18)	62	2.23 (0.21)	61	3.09 (0.30)	< 0.01*
Sleep function	69	1.65 (0.20)	66	1.96 (0.16)	62	2.07 (0.20)	61	2.30 (0.17)	0.09
<b>Anchor-based approach</b>									
<i>Regression method</i>									
SNOT-22 total	58	6.84 (1.06)	51	16.41 (2.18)	53	27.21 (1.62)	48	32.60 (3.35)	< 0.01*
Rhinologic symptoms	61	4.05 (0.64)	51	6.78 (0.81)	53	-9.08 (0.81)	49	10.32 (1.05)	< 0.01*
Extra-nasal rhinologic symptoms	60	1.62 (0.41)	53	2.58 (0.52)	53	4.19 (0.41)	50	4.27 (0.50)	< 0.01*
Ear and facial symptoms	59	1.19 (0.34)	53	2.58 (0.46)	53	5.04 (0.52)	49	6.80 (0.80)	< 0.01*
Psychological function	60	0.39 (0.34)	52	3.50 (0.82)	53	7.63 (0.71)	49	9.58 (1.25)	< 0.01*
Sleep function	61	0.60 (0.33)	53	3.43 (0.79)	53	6.34 (0.63)	50	6.82 (1.02)	< 0.01*

Abbreviations: SNOT-22, 22-Item Sino-nasal Outcome Test; MID, minimal important difference

## Conclusions

- MID values of the SNOT-22 are robust to sex and age differences among operatively-treated CRS patients
- Among the overall cohort, the MID calculated using the effect size method was comparable with previous reports of the SNOT-22 total MID. Values calculated using the regression method may differ from previous estimates of the MID due to the chosen EQ-5D threshold value of 0.7, or because of the method used.
- MID values of the SNOT-22 in this population likely vary based on patients’ preoperative sino-nasal health
- We recommend four MID values of the SNOT-22 instrument total based on increasing preoperative SNOT-22 score: 6.84, 16.41, 27.21, and 32.60
- Further research should explore whether MID values are dependent on other factors, such as presence of nasal polyps versus other subtypes or chronic sinus disease

## References

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