Health Utilities Among Patients with Chronic Rhinosinusitis with Nasal Polyps: An Exploratory Analysis from the WAYPOINT Trial

Danny Gibson[1], Agota Szende[2], Emilija Veljanoska[3], Sam Colman[4], Santiago Zuluaga Sanchez[5]

[1]Market Access and Pricing, AstraZeneca, Cambridge, United Kingdom; [2]Market Access Consulting & HEOR, Fortrea, Leeds, United Kingdom; [3]Market Access Consulting & HEOR, Fortrea, Munich, Germany; [4]Market Access Consulting & HEOR, Fortrea, Sydney, Australia; [5]Health Economics, Amgen, Uxbridge, United Kingdom

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Introduction

- Chronic rhinosinusitis with nasal polyps (CRSwNP) is a highly prevalent inflammatory airway disease associated with substantial symptom burden and impaired health-related quality of life (HRQoL).
- Evidence on health utilities in CRSwNP remains limited, particularly for characterizing patients by baseline severity.
- This limits the granularity of health economic models, which require severity-specific utilities to quantify treatment effects on quality-adjusted life years.

Objective

- To estimate health utility values across CRSwNP severity states using trial data, and to compare results across four preference-based utility instruments, including both directly elicited and mapped approaches.

Methods

- Analyses were conducted in SAS 9.4, using data from WAYPOINT (NCT04851964), a phase 3, randomized, double-blind, placebo-controlled trial of tezepelumab in adults with CRSwNP.
- Eligibility criteria included a 22-item Sino-Nasal Outcome Test (SNOT-22) score of ≥30 at baseline, indicative of moderate-to-severe symptom burden.
- Utility values were evaluated and modelled at baseline and weeks 24 and 52 using repeated measures.
- The model included covariates for visit, treatment, health state (based on SNOT-22 score: ≤20 = mild; 21–50 = moderate; >50 = severe), and treatment-by-health state interaction.
- All patients randomized and receiving any investigational product were included in the analysis, irrespective of their protocol adherence and continued participation in the study.
- Four utility estimation methods were applied using published algorithms:
  - EQ-5D-3L (crosswalk from EQ-5D-5L) (van Hout et al., 2012).[1]
  - SF-6D, mapped from SF-36 (Brazier et al., 2002).[2]
  - EQ-5D-3L, mapped from SF-36 (Rowen et al., 2009).[3]
  - EQ-5D-3L, mapped from SNOT-22 (Crump et al., 2017).[4]

Results

- The demographics and baseline characteristics of participants in the WAYPOINT trial reflect a clinically relevant population with high disease burden (**Table 1**); over 80% had a baseline SNOT-22 score >50, 71.3% had a history of prior nasal polyp surgery, and 60% had comorbid asthma.

Table 1. Demographics and baseline key characteristics (WAYPOINT)

Baseline Characteristics	**Statistics or category**	**Overall** (N=408)
Age (years)	n Mean (SD) Median Min; Max	408 49.7 (13.65) 51.0 18; 81
Gender, n (%)	Male Female	266 (65.2) 142 (34.8)
Comorbid asthma, n (%)	Yes No	245 (60.0) 163 (40.0)
Aspirin/NSAID exacerbated respiratory disease, n (%)	Yes No	71 (17.4) 337 (82.6)
Prior nasal-polyp surgery, n (%)	Yes No	291 (71.3) 117 (28.7)
Baseline EOS count, n (%)	<300 cells/µl ≥300 cells/µl	186 (46.0) 218 (54.0)
Baseline SNOT-22 score, n (%)	≤50 >50	74 (18.1) 334 (81.9)

- Across all instruments, utility scores decreased with worsening CRSwNP severity, confirming the negative impact on quality of life; statistically significant differences were observed across all severity levels (**Figure 1**).

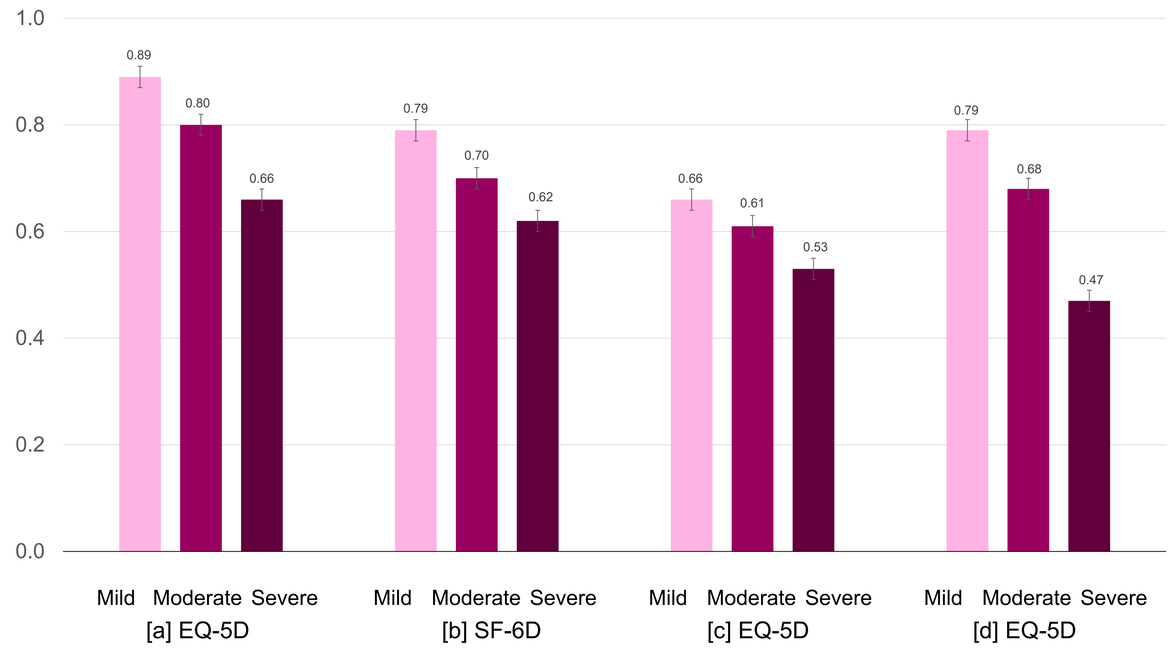

Figure 1. Modelled utility scores (least square mean with standard error) by disease severity averaged over treatment arms and visits across four estimations methods

[a] EQ-5D utility based on the 3-level crosswalk from EQ-5D-5L by van Hout et al. (2012)[1]
[b] SF-6D utility is mapped from SF-36 using the algorithm described by Brazier et al. (2002)[2]
[c] EQ-5D utility is mapped from SF-36 using the algorithm provided by Rowen et al. (2009)[3]
[d] EQ-5D utility is mapped from SNOT-22 using the algorithm provided by Crump et al. (2017)[4]

- The widest utility range between mild and severe disease was observed using EQ-5D-3L mapped from SNOT-22 (Δ = 0.34), indicating strong sensitivity to health state variation.
- EQ-5D-3L crosswalk from EQ-5D-5L also showed strong discrimination (Δ = 0.25), whereas SF-6D had a smaller spread (Δ = 0.18).
- EQ-5D-3L values mapped from SF-36 were uniformly lower and more compressed (Δ = 0.15).
- Method choice had a quantifiable impact on both the absolute utility values and the observed differences between severity groups.
- Nasal polyp exacerbations—defined as acute symptom worsening requiring systemic corticosteroids or antibiotics—were linked to measurable disutility across all instruments, reinforcing the impact of disease activity on HRQoL (EQ-5D-3L crosswalk from EQ-5D-5L: -0.036; SF-6D mapped from SF-36: -0.024; EQ-5D-3L mapped from SF-36: -0.001; EQ-5D-3L mapped from SNOT-22: -0.002).

Conclusions

- Health utilities in CRSwNP are strongly associated with disease severity, with lower values observed in patients with more severe symptoms; all four methods captured this trend, although the magnitude of differences varied by instrument.
- EQ-5D-3L mapped from SNOT-22 showed the greatest discriminatory power and may be better suited to capture disease burden in this population.
- These utility estimates provide critical inputs for cost-effectiveness analyses and highlight the importance of selecting appropriate mapping strategies in economic models of CRSwNP.

Abbreviations

CRSwNP = chronic rhinosinusitis with nasal polyps; EOS = Eosinophils; EQ-5D = EuroQol 5-dimensions; HRQoL = health-related quality of life; Max = Maximum; Min = Minimum; n = Number of participants; NSAID = Non-steroidal anti-inflammatory drug; SD = Standard deviation; SNOT-22 = 22-item Sino-Nasal Outcome Test; µl = Microliter.

References

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