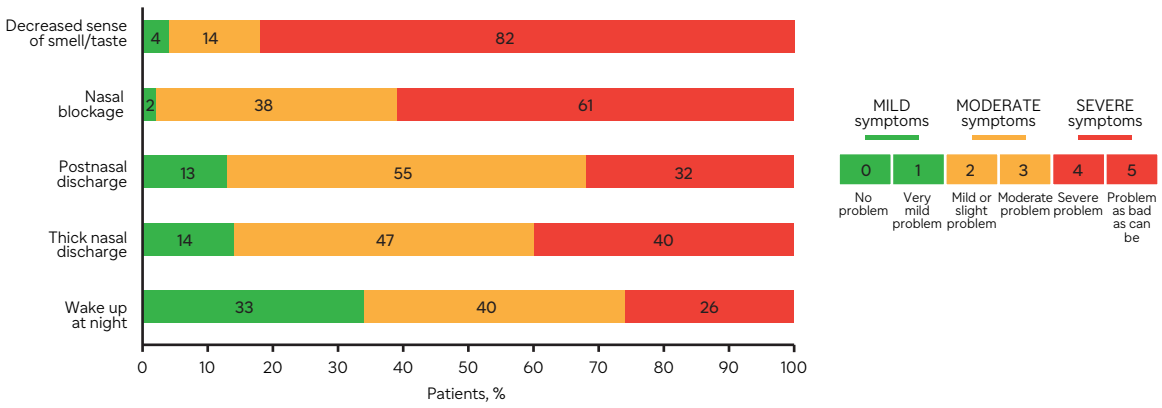
Mechanisms of *Olfactory Dysfunction* in CRSwNP

Loss of smell

- Main complaint in CRSwNP[1]
- Reported by 9 out of 10 patients with uncontrolled disease[1,2]

SYMPTOMS

Symptom severity of top 5 SNOT-22 items ranked by CRSwNP patients (pooled analysis; n=712)[1]



TYPE 2 INFLAMMATION

In a study of CRS patients with different inflammatory endotypes (n=230), loss of smell was associated with the type 2 endotype[3]

DISEASE MECHANISMS

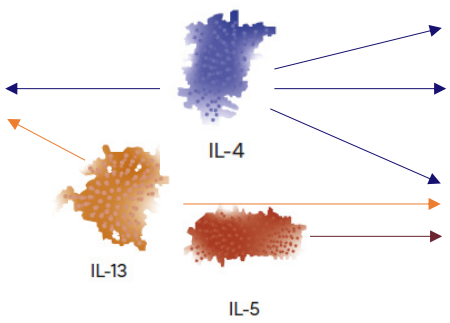
OD in patients with CRSwNP arises from multiple mechanisms that involve structural and neural disruptions[4,5]

Conductive dysfunction[4]
- Blocked transmission of odorants to olfactory epithelium

Sensorineural dysfunction[5]
- Impaired olfactory receptor signalling to the brain

Key inflammatory cytokines and their roles in OD[6]

- Goblet cell hyperplasia
- Mucociliary dysfunction
- Mucosal edema
- Polyp formation
- Tissue remodelling



- Anosmia
- Impaired sensory neuron renewal
- Olfactory receptor dysfunction

Key messages

- **Persistent type 2 inflammation** in CRSwNP leads to tissue changes, swelling, and impaired smell[7,8]
- Prolonged inflammation damages the epithelial barrier, increases mucus secretion, and impairs sensory neurons, **disrupting the sense of smell**[8]

CRS(wNP), chronic rhinosinusitis (with nasal polyps); IL, interleukin; OD, olfactory dysfunction; SNOT-22, 22-item Sino-Nasal Outcome Test

References:
1. Hopkins C, et al. Otolaryngol–Head and Neck Surg. 2024;170:1173–82; 2. Chen S, et al. Curr Med Res Opin. 2020;36:1897–911; 3. Stevens WW, et al. J Allergy Clin Immunol Pract. 2019;7: 2812–20; 4. Dekeyser A, et al. Int J Mol Sci. 2024;25:4460; 5. Czerwaty K, et al. Diagnostics (Basel). 2022;12:2361; 6. Kim B, et al. J Allergy Clin Immunol. 2024;153:879-93; 7. Whitcroft KL, et al. Rhinology. 2023; Suppl 33:1–108; 8. Sanofi Smell Booklet 2024. Available from: https://www.campus.sanofi/dam/jcr:bc04684d-ccc3-407b-a9e3-2ad32513ed4b/Sanofi%20smell%20booklet.pdf. Accessed Jan 2025.

MAT-BE-2500153-1.0-01/2025