

# An Olfaction Experience

*in Napa*



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ENT in Napa - April 30, 2026

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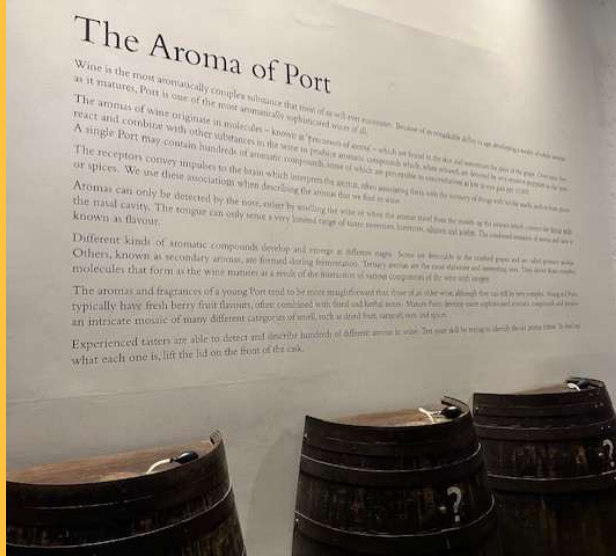
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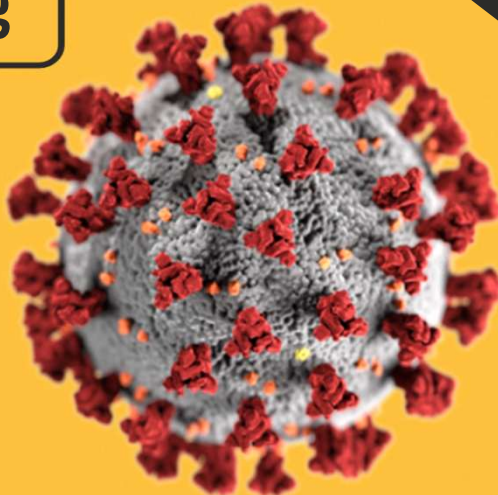
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**Nobody cared  
about smell loss  
until I came along**



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Americans over age 40 with measurable olfactory dysfunction...



Men  
Ethnic minorities  
Lower SES

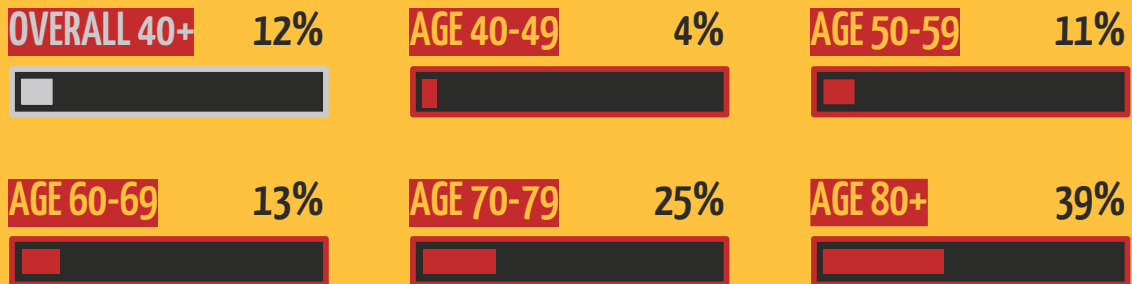
**13.3 MILLION = 12.4% POPULATION**

# EPIDEMIOLOGY

NIDCD 2019  
Hoffman et al, 2016

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## PREVALENCE BY AGE



NIDCD 2019  
Hoffman et al, 2016

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# MORE SMELL STATISTICS

66%

## LIFETIME PREVALENCE

Individuals who are aware of a period of decreased smell acuity in lifetime

23%

## SELF-REPORT

Individuals over 40 who report alteration in sense of smell

7%

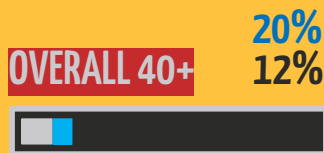
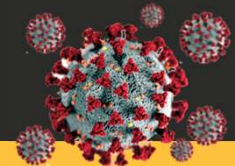
## PHANTOM ODORS

Individuals over 40 who report sometimes experiencing phantom odors

Bainbridge et al, 2018  
Rawal et al, 2016

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# PREVALENCE IMPACT BY COVID-19



700,000 – 1,600,000

additional cases due to COVID-19

5% -12%

Khan et al, 2021

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## SPECIALIZED NEURAL SYSTEMS FOR OLFACTION

### CRANIAL NERVE I

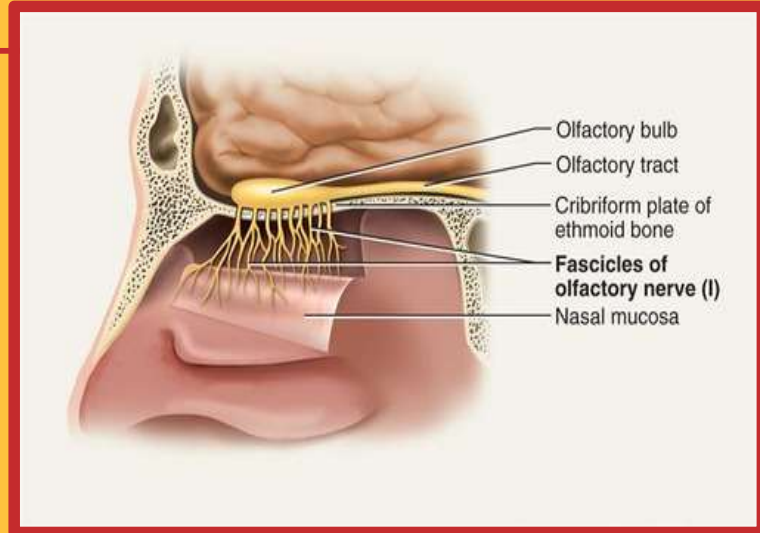
Olfactory nerve - main olfactory system

### CRANIAL NERVE V

Trigeminal nerve - trigeminal somatosensory system

### CRANIAL NERVE O

Nervus terminalis or terminal nerve; function unknown



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## TRIGEMINAL CHEMOSENSATION

AMMONIA



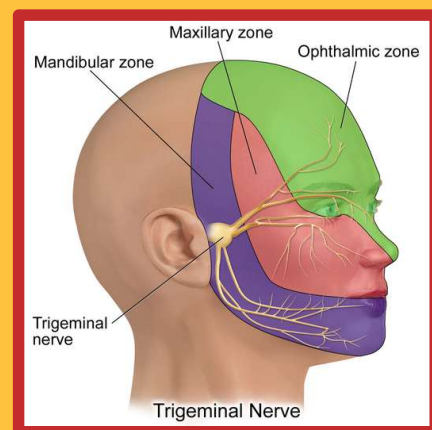
PEPPERMINT



MUSTARD



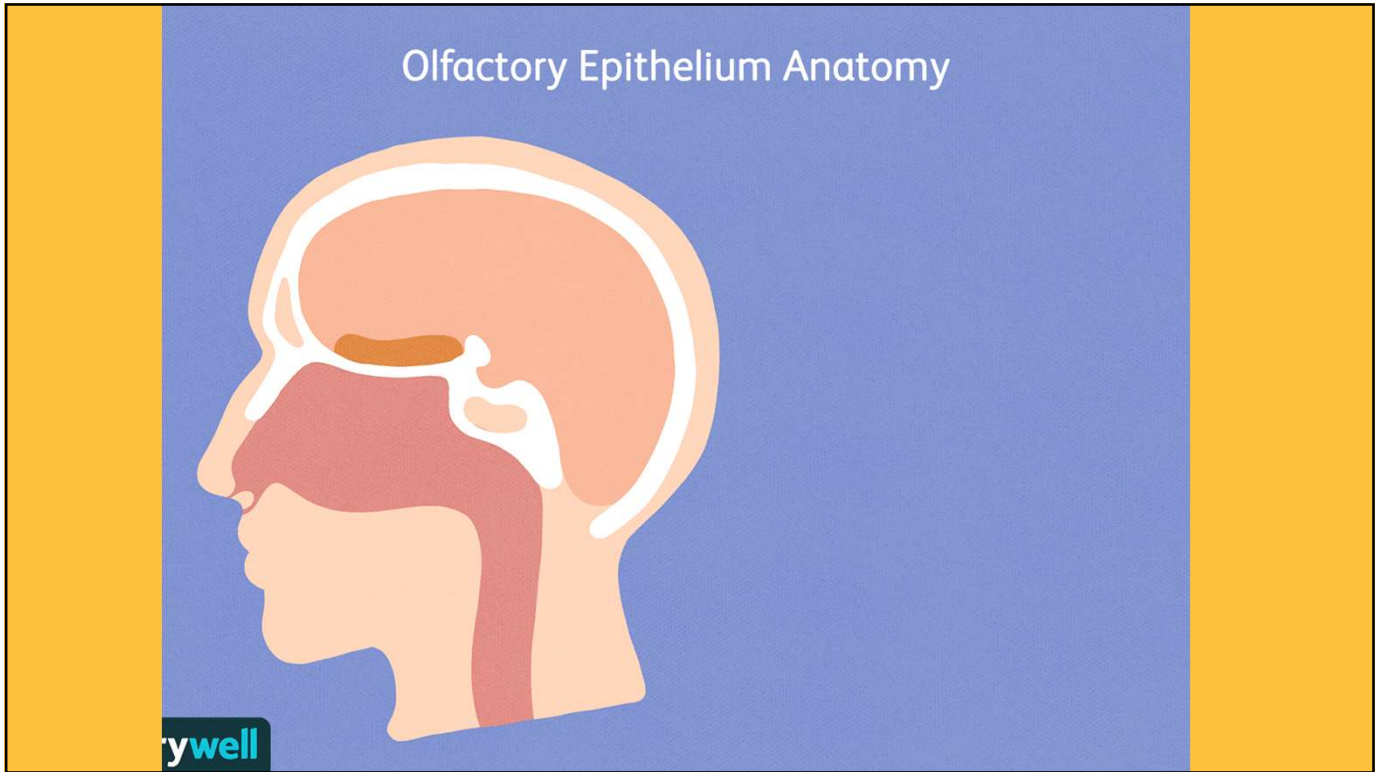
CAPSAICIN



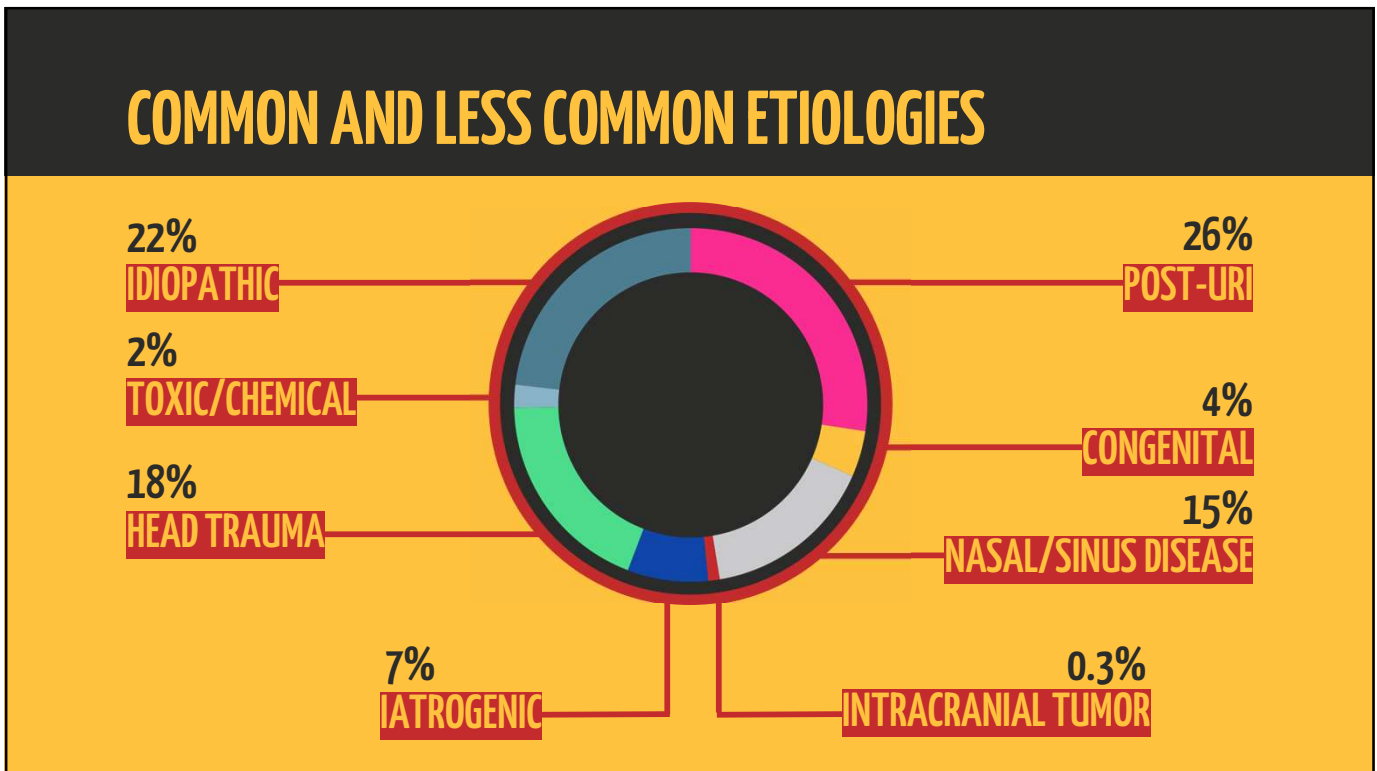
CN V<sub>2</sub>: Accessory nasal sensory nerve

Most odorants at high concentrations activate the trigeminal system

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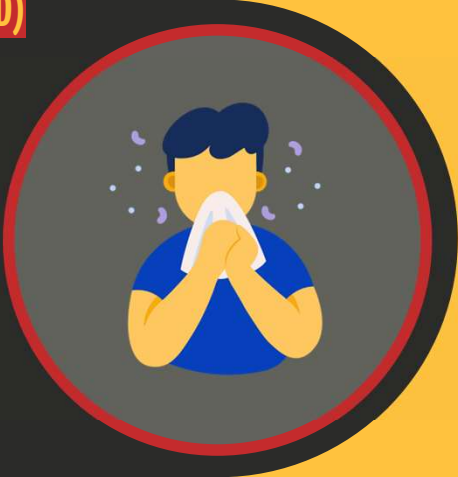


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## UPPER RESPIRATORY INFECTION

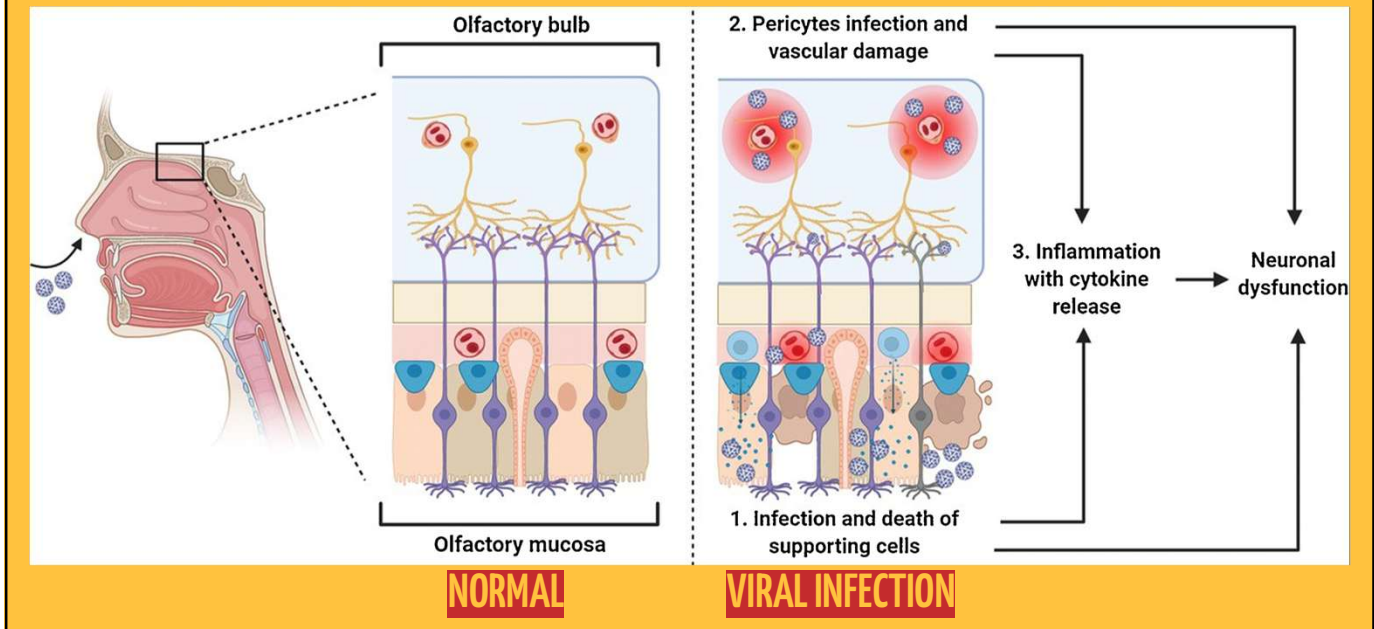
### POST-VIRAL OLFACTORY DYSFUNCTION (PVOD)

- Most common cause of chronic olfactory dysfunction
- More common in women and elderly (> 65 yr)
- Often a diagnosis of exclusion
- Hyposmia > Anosmia
- Dysosmias are more common
- Prognosis
  - ✓ 1/3 will improve by 6 mo
  - ✓ The longer the dysfunction, the poorer the prognosis
  - ✓ Olfactory training most effective therapy



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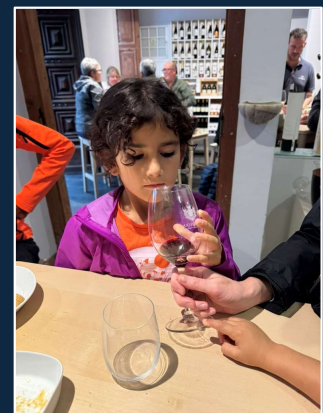
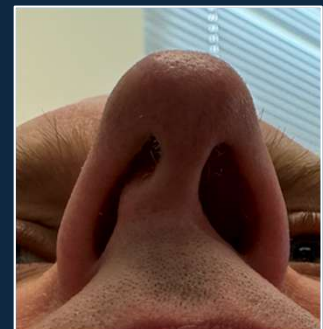
## PATHOPHYSIOLOGY OF URI-ASSOCIATED SMELL LOSS



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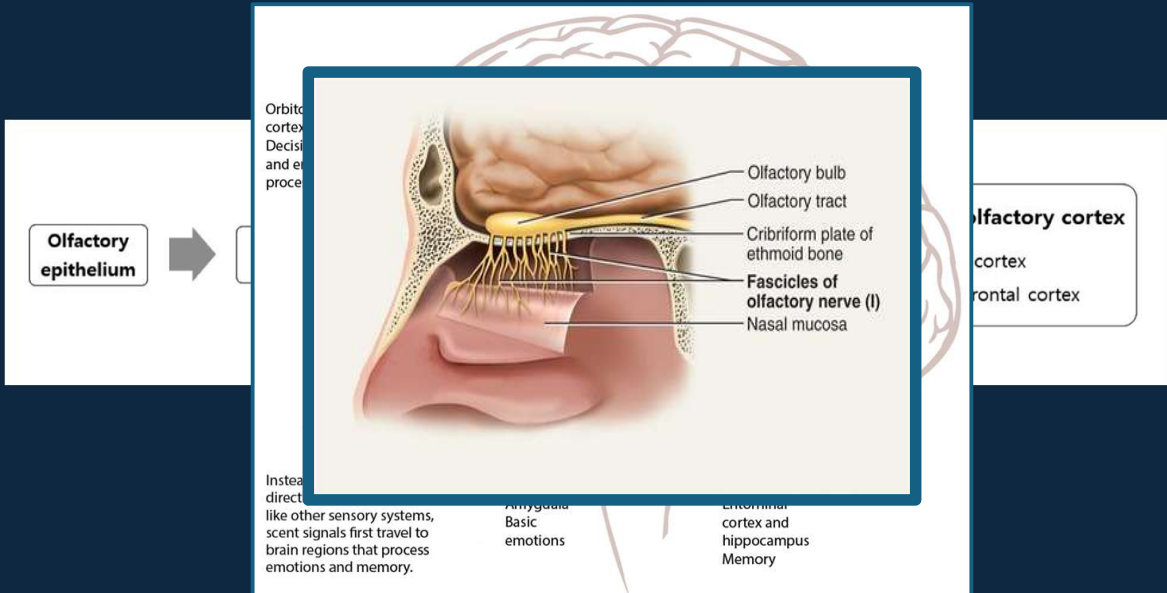
## Variations in Smell Sensitivity

- Genetic factors
- Influences:
  - Age (declines after 50)
  - Health (e.g., COVID-19 impacts)
  - Environment (smoking, pollution)
  - Training (sommeliers improve via practice).
- Measurement: Tests like University of Pennsylvania Smell Identification Test (UPSIT) quantify sensitivity.
- Specifics:
  - “Super-smellers:” About 1-2% are detecting odors at lower thresholds
  - 15-20% have some impairment.



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# What happens when we smell (simplified)?

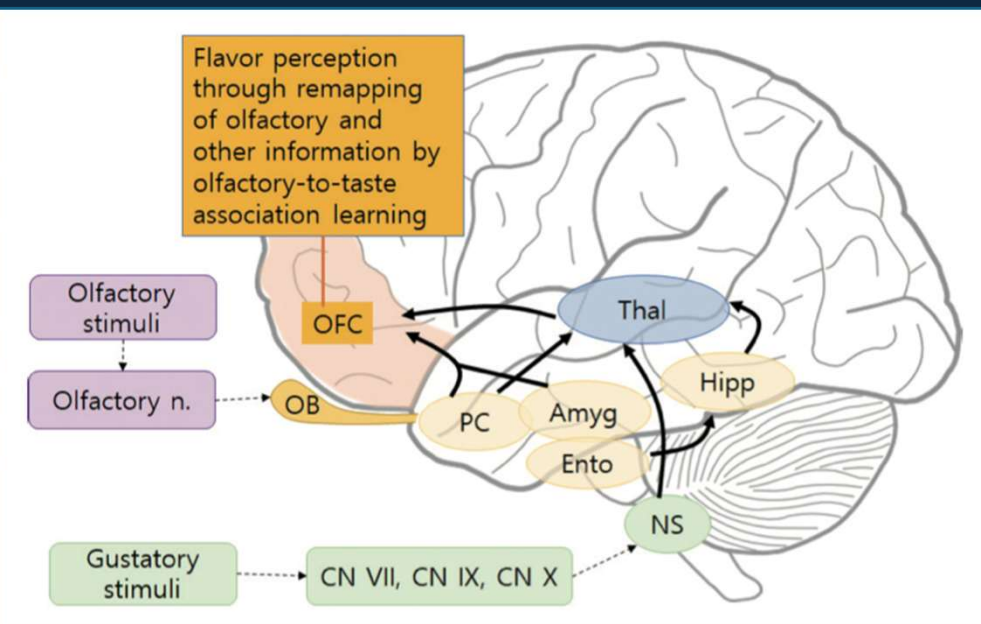


Han SA, Kim JK, Cho DY, Patel ZM, Rhee CS. The Olfactory System: Basic Anatomy and Physiology for General Otorhinolaryngologists. *Clin Exp Otorhinolaryngol.* 2023;16(4):308-316. doi:10.21053/ceo.2023.00185

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# So what is flavor?

- Orbitofrontal cortex; re-mapping form flavor
- Wine Tasting perceives
- Flavor of
  - the brain
  - the rest of the body
  - Individual

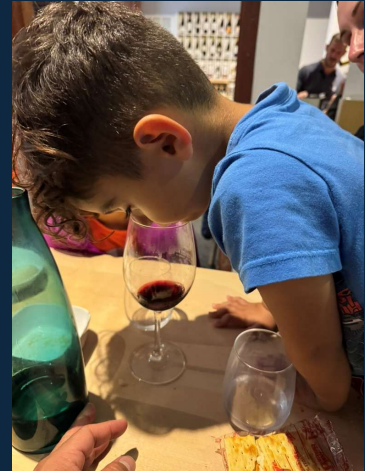


Han SA, Kim JK, Cho DY, Patel ZM, Rhee CS. The Olfactory System: Basic Anatomy and Physiology for General Otorhinolaryngologists. *Clin Exp Otorhinolaryngol.* 2023;16(4):308-316. doi:10.21053/ceo.2023.00185

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## Smell vs. Taste in Wine Perception

- Taste basics: Tongue detects only sweet, sour, salty, bitter, umami
- Smell's role: Identifies complex aromas like fruit, floral, earthy notes
- Experiment: Pinch your nose while tasting wine; it becomes bland, proving smell's dominance.



Campo R, Reinoso-Carvalho F, Rosato P. Wine Experiences: A Review from a Multisensory Perspective. *Applied Sciences*. 2021; 11(10):4488. <https://doi.org/10.3390/app11104488>

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## Mouthfeel

- Mouthfeel: refers to the tactile sensations generated inside the mouth during consumption.
- Regarding wine: mouthfeel usually has an active role on sensations associated to the experience of a wine's temperature, astringency, body/viscosity, prickling, sparkling, and even burning sensations
  - Tannin activity = dry on the palate, and Tannin concentration is associated with overall dry and dry on the palate.
- Industrial interest in how various properties of wine impact perception and consumption.

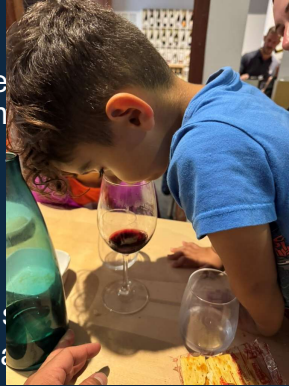
Sáenz-Navajas MP, Ferrero-Del-Teso S, Jeffery DW, Ferreira V, Fernández-Zurbano P. Effect of aroma perception on taste and mouthfeel dimensions of red wines: Correlation of sensory and chemical measurements. *Food Res Int*. 2020;131:108945. doi:10.1016/j.foodres.2019.108945

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# Impact of smell on Preferences and Abilities

- Preferences:
  - **High sensitivity** often leads to appreciate aged wines (e.g., Barolo with truffle notes).
  - **Low sensitivity** favors fruit-forward, young Zinfandel).
- Abilities:
  - Trained sensitive individuals excel in identifying varietals, regions, vintages.
  - Less sensitive may rely more on visual cues.
- Gender/age trends: Women generally have better smell sensitivity; preferences evolve with experience.
- Practical: Anosmia eliminates nuanced enjoyment, reducing wine to texture and basic taste.

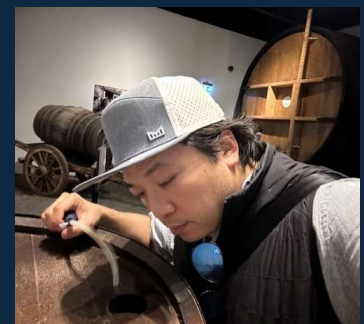


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<https://www.wineenthusiast.com/culture/wine/how-a-super-taster-tastes-wine/?srsltid=AfmBOoqhNblD8Dof-an8XBhRuZEetgd5QB16gkLcXu1S7nFvUefunCG>

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## Conclusion

- Recap: Smell is the cornerstone of wine tasting, modulated by sensitivity affecting distinction and preferences.
- Call to action: Explore your own olfactory profile and experiment with wines to deepen appreciation.
- Q&A: Open for questions on rhinology, neurophysiology, or specific wine queries.
- Highly recommend anecdotal experience and subjective assessment that is forthcoming!!!



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