

# Olfactory Disorders

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- olfactory dysfunction can affect patient's *safety, nutritional status, quality of life*;
  - anosmics increase use of sugar and seasonings (detrimental in diabetes, salt-sensitive hypertension).
  - considerable risk for food poisoning, gas poisoning.
  - Veterans Administration awards 10% whole body disability for total anosmia (American Medical Association – only 3%).

Whole-mouth **taste function** is much more resilient to alterations than is **olfactory function**, in large part because taste buds have redundant innervation (i.e. CN VII, IX, X).

Complaint of taste loss usually reflects olfactory disorder!

- *problem duration* is important - spontaneous recovery is unlikely after 6 months if damage to olfactory epithelium has occurred.

## CLASSIFICATION

Olfactory dysfunction can be **BILATERAL** or **UNILATERAL** (sometimes termed **BINASAL** or **UNINASAL**).

Etiologically:

- Transport** disorders (e.g. nasal obstruction)
- Sensorineural** disorders

## DEFINITIONS

**HYPOSMIA (MICROSMIA)** - diminished ability to smell.

N.B. *olfactory acuity* varies enormously *from person to person* (sometimes 1000-fold); olfactory sensitivity normally *declines with age*  $\approx 1\%$  / year.

- ability to smell decreases with cumulative *smoking* dose (smoking cessation can improve olfactory function over time).

**ANOSMIA** - loss of ability to smell:

**GENERAL (TOTAL) ANOSMIA** - all odorants on both sides.

**PARTIAL ANOSMIA** – alternative meanings:

- Specific anosmia* - anosmia to specific odorants with otherwise normal sense of smell.
- General hyposmia* - decreased sensitivity to all odorants.

**DYSOSMIA** - perverted smell perception:

**PAROSMIA (CACOSMIA)** – “rose smells more like garbage” (e.g. in “uncal fits”).

**PHANTOSMIA (OLFACTORY HALLUCINATION)** - medicine-like smell in absence of odor stimulation.

- frequent during olfactory epithelial *degeneration* / *regeneration*.  
N.B. differentiate from foul odors produced within nasal cavity (e.g. infections) or within body proper (e.g. altered metabolism).

**HYPEROSMIA** - abnormally acute smell function (e.g. in some epileptics prior to onset of ictal activity); most commonly idiopathic.

## ETIOLOGY

1. Alterations in ability to smell - first signs of *Alzheimer's disease, idiopathic Parkinson's disease* (but patients are unaware!)
  2. **Head trauma** (anosmia / hyposmia is frequently the only residual neurological impairment)
  3. **CNS tumors**  
e.g. tumors in olfactory groove or sphenoid ridge (e.g. meningiomas) can cause *Foster Kennedy syndrome* (ipsilateral anosmia, ipsilateral optic atrophy, contralateral papilledema).
  4. **Infections**, esp. nasal, paranasal.
  5. **Smoking, chemical exposure**
  6. **Metabolic disease** (esp. dysosmia) – diabetes, hepatic / renal diseases, hypothyroidism, etc.
  7. **Epilepsy** - uncal or temporal lobe foci that induce dysosmic / hyperosmic auras.
  8. **Psychiatric disorders** (esp. dysosmia)
  9. **Allergy**
  10. **Kallmann syndrome** (anosmia)
- because of *bilateral cortical & subcortical representation* of olfactory function, **unilateral lesions** at this level generally do not cause clinically meaningful olfactory dysfunction!

## DIAGNOSIS

**University of Pennsylvania Smell Identification Test (UPSIT)** see p. D1 >>

**Olfactory evoked potentials** can be measured accurately, but is very expensive (> \$100,000).

- trains of well-defined odorant pulses, with steep-onset gradients, are imbedded in humidified continuous airstream that is flowed through nose in manner that does not evoke somatosensory afferents.
- recording is from Cz referred to A1.
- N1 wave is obtained at 306-484 ms and P1 wave at 349-455 ms.
- useful in detecting malingering.

**Biopsy** of olfactory epithelium.

## TREATMENT

- rarely successful (very depends on etiology).
- *unilateral dysosmia* – **olfactory epithelium ablation**.
- *sensorineural hyposmia / anosmia* – **zinc & vitamin therapies** (evidence of efficacy is lacking); reassurance & education are very useful.

BIBLIOGRAPHY for ch. "Cranial Neuropathies" → follow this [LINK >>](#)

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**Viktor's Notes<sup>SM</sup> for the Neurosurgery Resident**  
Please visit website at [www.NeurosurgeryResident.net](http://www.NeurosurgeryResident.net)