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:

A. **Transport** disorders (e.g. nasal obstruction)

B. **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* ≈ 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:

1. *Specific anosmia* - anosmia to specific odorants with otherwise normal sense of smell.
2. *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).

1. ***Infections***, esp. nasal, paranasal.
2. ***Smoking***, ***chemical exposure***
3. ***Metabolic disease*** (esp. dysosmia) – diabetes, hepatic / renal diseases, hypothyroidism, etc.
4. ***Epilepsy*** - uncal or temporal lobe foci that induce dysosmic / hyperosmic auras.
5. ***Psychiatric disorders*** (esp. dysosmia)
6. ***Allergy***
7. ***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 >>](http://www.neurosurgeryresident.net/D.%20Diagnostics\D1-5.%20Neurologic%20Examination\D1.%20Neurologic%20Examination.pdf)

**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 Al.
* Nl 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 >>](http://www.neurosurgeryresident.net/CN.%20Cranial%20Neuropathies\CN.%20Bibliography.pdf)

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