Assessing the sense of smell

Assessment of the sense of smell is a frequently overlooked part of the clinical examination. The assessment is sometimes more complex than the examination of a 'single' cranial nerve and therefore not infrequently requires more than the simple question: 'Do you have any problems with your sense of smell?'. There is almost always a degree of uncertainty among exam candidates about how to proceed when the patient replies 'Yes' to this question, both in terms of immediate examination and further investigations.

This short article outlines a basic schema for examining the sense of smell and answering questions about further investigations which may be required. Owing to the subjective nature of smell perception the assessment involves a combination of both targeted history and clinical examination.

Initial targeted questions

'Do you have any problems with your sense of smell?'

If the answer to this question is 'Yes' the next step is to ask a series of questions to establish the nature of smell loss, e.g. diminished or absent sense of smell (hyposmia or anosmia), or distortion, e.g. perception of a smell that isn't present as an external stimulus (phantosmia) or distorted perception of an external stimulus (parosmia) (*Table 1*). Occasionally it is possible that a perceived phantosmia is actually caused by the presence of an internal malodour such as a fungal ball.

Timing of the smell disturbance

Was this a gradual or rapid loss of smell? Is the smell disturbance intermittent or persistent?

Associated loss of taste

Many patients complain of a concomitant loss of taste and do not recognize that it is caused by diminished olfaction until this is explored in more detail.

Any associated events or medical conditions

In particular ask specifically about head injury, history of a viral upper respiratory tract infection or chronic sinonasal conditions. Any prior history of surgical procedures to the nose and/or sinuses is also relevant. Are there any endocrine disturbances, e.g. diabetes mellitus, hypothyroidism, hypogonadism?

Medication history

There are numerous medications that are associated with disturbance of smell and/or taste. Importantly the effect on smell may occur over a period of time and there may also be a delay in recovery of smell after cessation of medication.

Exposure to chemicals

Does the patient smoke? Is there any exposure to industrial chemicals or environmental toxins?

Associated neurological and/or psychiatric symptoms

There is an association between smell disturbance and neurodegenerative diseases, e.g. Alzheimer's disease and Parkinson's disease. Particularly in older patients it is worth asking specifically about memory problems and motor symptoms. Temporal lobe epilepsy may be associated with olfactory hallucinations. Olfactory disturbance is also recognized in schizophrenia.

Examination

Nasal examination should include anterior rhinoscopy and rigid or flexible fibreoptic endoscopic examination to visualize the nasal cavity and nasopharynx. This should identify any obvious inflammation, mucopurulent discharge, polyps or masses. In particular the olfactory cleft should be examined for any signs of oedema or purulent discharge. Significant rhinitis may give the mucosa a pale appearance.

A dental examination may be appropriate if there is a history of persistent foul odour and especially if any symptoms of dysgeusia are present.

A full examination of the cranial nerves and examination of signs of raised intracranial pressure, e.g. papilloedema, may be appropriate.

In particular, remember that the trigeminal system (cranial nerve V) is involved in the detection of noxious stimuli through sensory innervation of the nose and sinuses. This is distinct from detection of olfactory stimuli via the olfactory nerve (cranial nerve I).

Do you know any particular tests for assessing the sense of smell?

Ideally an olfactory test should be validated – there are a number of commercially

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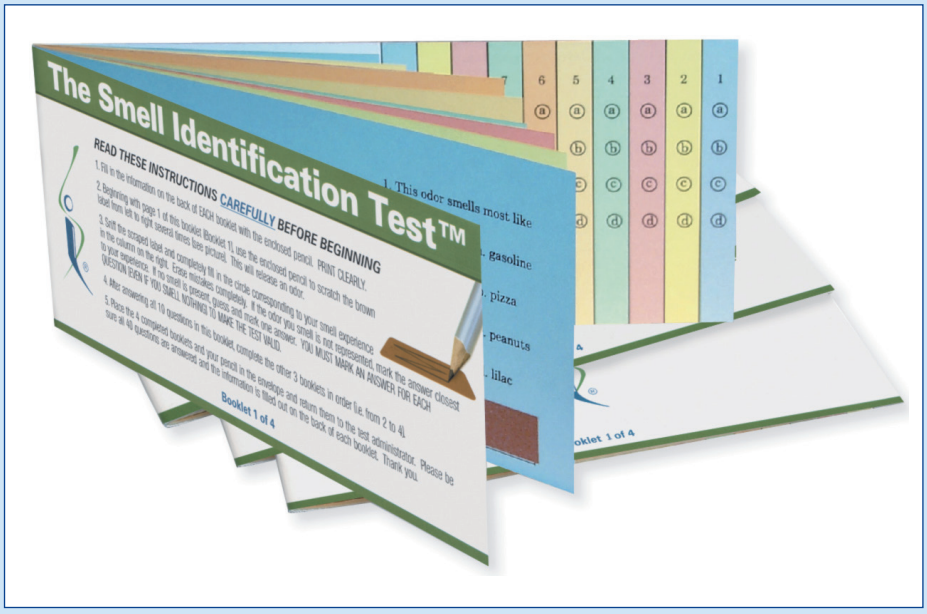
Table 1. Terminology for disturbance of smell

Anosmia	Total loss of smell
Hyposmia	Diminished sense of smell
Parosmia	Perception of smell different to that previously remembered
Troposmia	Form of parosmia where the distortion is unpleasant
Euosmia	Form of parosmia where the distortion is pleasant
Phantosmia	Perception of smell in absence of a stimulus
Cacosmia	Form of phantosmia with a bad smell

available validated kits in existence. The modalities of smell assessed may vary; most will assess identification and others will also address threshold and discrimination. Common odourants for threshold testing include n-butyl alcohol and phenethyl alcohol; the former has a neutral odour, availability, low toxicity and solubility. For example, the 'Sniffin Sticks' system can be supplied with either n-butanol or phenethyl alcohol felt tip pens that contain different sequential dilutions of the test odour (Hummel et al, 1997). 'Sniffin Sticks' have the advantage of being able to assess odour threshold, discrimination and identification.

Other test kits include the University of Pennsylvania Smell Identification Test (Doty et al, 1995) (*Figure 1*). This involves 40 microencapsulated odours in four envelope-sized booklets with 10 scratch and sniff odourants in each booklet. Above each odourant strip there are four possible choices for the correct odour. The anosmic patient will score around 10/40 and patients with hyposmia may be categorized as mild, moderate or severe depending on the score. The test may also identify patients who are feigning symptoms if they score less than 5. The limitation of identification tests in isolation is that they require verbalization of the odours as well as cultural exposure. The use of objective olfactory testing is not yet widespread although it is available in some subspecialist clinics, especially those with an interest in olfactory disorders and the research setting.

Figure 1. The booklets for the University of Pennsylvania Smell Identification Test.



Conclusions

Taking a thorough history is key to the assessment of the sense of smell, particularly as in the absence of chronic rhinosinusitis the clinical examination is often normal for many of the other possible causes. After general questioning about the nature of smell disturbance and associated symptoms, the use of targeted questions is useful in the diagnostic process. Other investigations and management of the patient with hyposmia is discussed in more detail in the accompanying article (Syed and Philpott, 2015). BJHM

Figure 1 *is reproduced courtesy of Sensonics, Inc.,Haddon Hts., NJ 08035 USA*

Conflict of interest: Mr I Syed: none; Mr C Philpott is a trustee of the Fifth Sense charity.

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KEY POINTS

- The history is the key component of the assessment of smell.
- Clinical examination should include assessment of the trigeminal nerve which is involved in the detection of noxious stimuli.
- The use of a validated olfactory test is important to allow assessment of threshold and discrimination of smell.