

Do humans have a unique breath 'fingerprint'?

Australian Breath Clinic's patented 'Halicheck' test helps put an end to bad breath concerns

By Dr Geoffrey Speiser, Director, Australian Breath Clinic

Every dentist knows when a patient has periodontal disease simply by the scent of the patient's breath when he or she is speaking. However, until recently, there has been no practical scientific method available to both patients and dentists to assist them in measuring the different breath odours and what the presence of a specific odour may indicate. For example, research has shown that patients with periodontal disease often present with a volatile sulphur compound called Methyl Mercaptan in their breath. This is a waste product of periodontal bacteria and the smell of this gas closely resembles human faeces. In particular we are talking about the bacteria *P. gingivalis*, *T. denticola*, *T. forsythensis*, *Fusobacterium periodonticum*, producing this smell.

However, a new device – which would not look out of place on the set of popular TV crime investigation dramas such as "CSI" – can actually measure the various mouth gases, including those related to periodontal disease, in as little as 10 minutes. The HALICHECK is based on gas chromatography – the same technology being used to detect the presence of cancer



compounds in people's breath – and can break down a sample of mouth air into as many as 50 individual gases.

The HALICHECK provides a snapshot of each person's breath and the findings are so distinctive that the question has been posed whether a mouth gas reading could be as unique as a fingerprint. This thought came to fruition following the case of the 'bad breath' bandit – a masked bank robber terrorising the city of Detroit who was identified by his odorous breath.

So what role can a machine such as the HALICHECK play in practical dentistry? In the same way that taking routine x-rays at annual check-up appointments is now considered the standard of care, I believe that taking a yearly mouth gas sample should also be included in the periodic check-up practice. A simple non-invasive air sample can give a digital printout that will allow dentists to evaluate how effectively the patient is cleaning there:

- ◆ Mouth – based on Hydrogen Sulphide (HS) levels
- ◆ Teeth and gums – based on Methyl Mercaptan (CH₃SH) levels
- ◆ Tongue and throat – based on Dimethyl Sulphide [(CH₃)₂S] levels

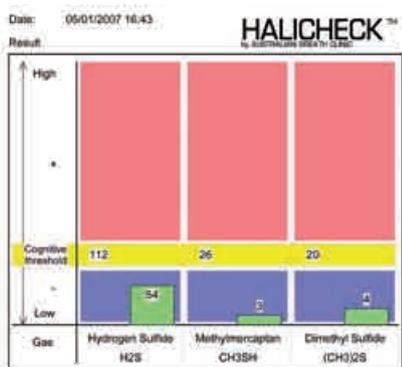
Not only does it give the dentist vital information, but the HALICHECK provides a



digital printout that allows you to discuss your findings with your patient. This allows for direct motivation of the patient rather than scolding them like a 'naughty' child. The printout also enables dentists to conduct follow-up checks to see if their cleaning protocol is being implemented. Working together, dentists and patients can take a collaborative approach to treating the patient's problem and overcoming their apathy or issues.

I have included below some examples of how the HALICHECK can assist in a typical dental setting.

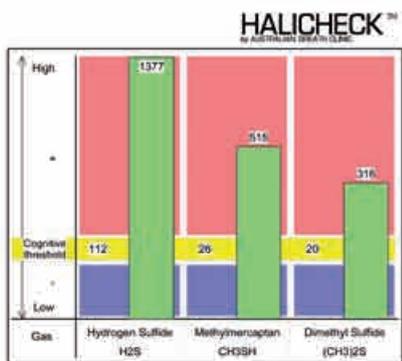
A Healthy Halicheck Mouth Gas Reading



Every person, regardless of their oral hygiene, will have some level of volatile sulphur compounds in their mouth and in a healthy and bacterially balanced mouth the readings would be H₂S below 80, CH₃SH below 7, and (CH₃)₂S below 4. These readings are below the yellow 'smell' line and, if mapped linearly, the slope from left to right indicates good bacterial balance and a healthy mouth.

Now review the reading below from an individual with poor oral hygiene.

CASE 1: Poor Oral Hygiene

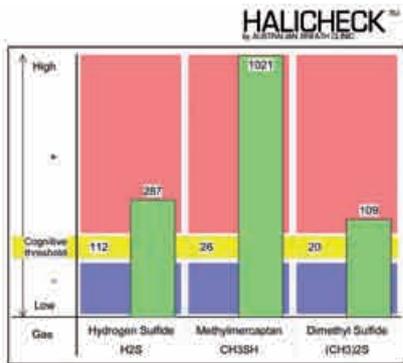


All three gas levels are above the average 'smell' line even though they have maintained the left to right slope. The high level of H₂S can be directly attrib-

uted to the dorsum of the tongue¹ and general poor hygiene²

In this instance, if the patient is given simple oral hygiene instructions their mouth would show a marked improvement in both taste and scent.

CASE 2: Periodontal Disease or possibly just gingivitis



Patients with periodontitis and gingivitis will present with higher levels of Methyl Mercaptan in their reading. In fact if the ratio of H₂S to CH₃SH is greater than 3:1 or if the level of CH₃SH is greater than 200ppb, then these have been scientifically shown to be strong indicators of periodontal disease^{3,4}. Otherwise we can consider the readings to indicate gingivitis.

In the instance of this graph, the patient would require periodontal scaling to reduce their breath odour. Going back to the clinic setting, this reading is reflective of a typical periodontal patient; had this individual walked into a surgery, most dentists would have been able to detect the patient's periodontal gases when speaking with them. However, the majority of dentists may have found it difficult to broach the subject of the smell left on the patient's breath from the periodontal disease. Now, with the help of the HALICHECK device, and gaining a breath reading, the dentist is now able to show these graphs to the patient, explain their meaning, and together work with the patient to achieve a healthy mouth balance to minimise gas levels.

Of course it goes without saying that HALICHECK is an effective way of treating bad breath (Halitosis) in a non-embarrassing and non-threatening manner. Of significance, bad breath continues to be a taboo subject amongst Australians. Whereas most people can freely discuss their private lives, their political and religious views, even diseases and ailments, bad breath continues to be off-limits. For those who suffer from it, research

has shown that the majority of these people cannot even rely on friends, colleagues or partners to let them know of their condition due to the socially stigmatising nature of the subject. So not only is the patient unaware their breath has an odour, but it can be equally difficult for a dentist to alert them to this fact.

For patients who do suffer from bad breath, added to the embarrassment most will feel with discussing their condition, many are also hampered by the fact that are not specific 'terms' or words to allow them to articulate this properly. They simply know their breath has an odour and this is of great concern to them.

What the HALICHECK enables the dentist to do is to provide a framework for discussing what can be an embarrassing subject for the patient. It also allows both dentist and patient to identify the cause of the problem, address this, and monitor the progress of any recommended oral health regime or program. The process of analysing a person's breath also removes some of the emotional subjectivity associated with this issue, making it easier to discuss and perhaps also manage. In fact, contrary to what many patients believe, a breath reading using the Halicheck takes as little as 10 minutes and is as easy as blowing air into a tube.

Due to the prevalence of bad breath amongst Australians, estimated at roughly 30 per cent of the population, HALICHECK should be considered an essential part of every dentist's hygiene department. ♦

The Australian Breath Clinic is now offering dental practitioners the opportunity to utilise its patented Halicheck device to provide breath reading and analysis to their patients. To learn more about this exciting technology, call:

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