

Breath testing comes of age

Aldehydes are a vital biomarker in understanding a patient's general health from a biochemical perspective

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DIAGNOSING CHIROPRACTIC CONDITIONS IS MOST FREQUENTLY DONE THROUGH PATIENT HISTORY, clinical examination, and medical imaging. Since most chiropractic patients seek care for musculoskeletal issues, lab testing is not as commonly used by chiropractors as other medical disciplines.

With the growing focus on whole-body care and nutritional supplements, however, wellness testing is becoming a larger part of today's chiropractic practice. One of the newer wellness biomarkers is non-invasive and, to the surprise of many patients, can be found in their breath.

The breath contains more than 1,000 individual components within the "exhaled breath condensate," including molecular gases, volatile organic compounds, and aerosolized droplets, which can be identified through mass spectrometry and gas chromatography. Recent advances in capturing and condensing the exhaled breath have allowed scientists to reli-

ably capture breath compounds in the parts-per-billion range. Many of these biomarker compounds have equivalent sensitivity and specificity for breath testing as with blood or urine testing.

For the layperson, this means that breath testing for certain compounds can be as good as blood testing.

Hippocrates was one of the first to incorporate breath analysis as part of his diagnosis. He described *fetor oris* and *fetor hepaticus* and directly related breath aroma to specific diseases.¹ In the mid-1800s, Nebelthau noted the presence of acetone in the breath of diabetic patients.² Even Linus Pauling used gas-based chromatography analysis in the 1970s to identify more than 250 components in the breath.

One of the more researched exhaled breath compounds are aldehydes. These are important biomarkers of oxidative stress, which can be caused by cancer, heart disease, autoimmune and neurological disorders, and chronic infectious diseases, as well as smoking, poor diet, and excessive exercise. For

wellness and nutrition-focused chiropractors who pay particular attention to signs of oxidative stress as indicators of overall health, aldehydes are a vital biomarker in understanding a patient's general health from a biochemical point of view.

In states of dis-ease, patients will have significant free radicals in their system that frequently will damage cell walls. The byproducts of the biochemical cascade from such free-radical damage are aldehydes, thereby making aldehydes a highly correlative biomarker for oxidative stress. As such, testing for aldehydes becomes an important wellness indicator.

The gold standard for aldehyde testing is the TBARS blood test, which tests for a single aldehyde, MDA, with which you may be familiar. However, the advances in breath testing by some companies that use a proprietary reagent based on the Schiff Test for detection of aldehydes, now allow for in-office testing of up to 23 breath aldehydes.

The Schiff reagent is the reaction


product of Fuchsin or Pararosaniline and sodium bisulfate with the aldehyde, resulting in a characteristic magenta color change that can be directly correlated to the concentration of aldehydes in the breath. Simply having patients blow through a specially designed tube containing the reagent can provide the means to test their oxidative stress levels, resulting in a personalized wellness score.

The breath aldehyde score is especially important for chiropractors providing anti-oxidant supplementation to their patients. Every person is unique and will respond differently to a supplementation program.

The key to successful practice is knowing how to treat a specific individual patient, and breath aldehyde testing can measure and track a patient's individual response to a treatment program.

Providing proper care to patients with diseases known to involve oxidative stress pathways has been shown to reduce aldehyde levels.³ Affordable technology now allows for this test to be performed directly in the clinic. Breath aldehyde testing can be conducted once per month for up to six months at a time to chart patient's progress.

Adding services like aldehyde testing, either by using

traditional TBARS or new breath-testing technology, can result in better patient compliance and outcomes. In today's market, having quantitative methods that help patients understand and validate their treatment is an important enhancer of the value of chiropractic. 



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