

# Unconventional Dentistry: Part IV.

## Unconventional Dental Practices and Products

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### A b s t r a c t

*This is the fourth in a series of 5 articles providing a contemporary overview and introduction to unconventional dentistry (UD) and its correlation to unconventional medicine (UM). Several common UD and UM practices are described to familiarize practitioners with a variety of theories, practices, products and treatments that specifically apply to dentistry. This brief review is not intended as an in-depth resource.*

**MeSH Key Words:** *alternative medicine; dentistry; science*

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### Herbal Medicine

**H**erbal medicines are drugs of plant origin used to treat diseases or to attain or maintain a condition of improved health. They account for sales of over \$3 billion annually in the United States.<sup>1</sup> Many potent and effective conventional drugs originate from plants (e.g., digoxin, quinine, morphine), but there is concern about the risks and safety of the many untested herbal products that are widely available and marketed as supplements.<sup>2</sup> Relatively few herbs have been studied in prospective, double-blind, randomized, placebo-controlled clinical trials.<sup>3</sup> Although some herbal medicines have been proven useful in specific medical disorders,<sup>4</sup> there is a lack of evidence of effectiveness for any dental condition. For example, a clinical trial of an herbal mouthwash showed that its effectiveness was equivalent to placebo in preventing oral mucositis from chemotherapy.<sup>5</sup> Nonetheless, some dentists sell, dispense and recommend herbal medicines.

In Canada, all prescription and non-prescription drugs are regulated by Health Canada under the Therapeutic Products Programme.<sup>6</sup> "Natural health products" such as vitamin and mineral supplements and herbal products *for which therapeutic claims are made* (authors' emphasis) are regulated as drugs.<sup>6</sup> Promoters of herbal medicines sold as "health food" or supplements are careful not to make therapeutic claims and therefore are not required to pass any regulatory analysis.<sup>3</sup> In the United States, under the Dietary Supplement Health and Education Act, promotion and marketing of herbal medicines as "dietary supplements" and carefully worded disclaimers that the Food

and Drug Administration has not approved health claims also evade the regulation of these "medicines" as drugs.<sup>2</sup>

Consumer acceptance of herbal medicines is partly based on the incorrect assumption that "natural" equals safe.<sup>7</sup> Unregulated herbal medicines generally remain a concern by failing to provide adequate label information, properly identify plant sources, standardize dosages, identify all constituents, identify and track batches during production and track harm.<sup>2</sup> Additional unknowns include bioavailability, drug interactions, appropriate dosing and side effects.

### Jaw Cavitations (NICO)

The controversial proposal of a low-grade, non-suppurative, radiographically "invisible" osteomyelitis presenting as a jawbone cavity associated with facial pain and trigeminal neuralgia was first described more than 20 years ago.<sup>8</sup> The current version of this concept, so-called neuralgia-inducing cavitation osteonecrosis (NICO),<sup>9</sup> has evolved into an even more controversial issue that remains unproven and associated with iatrogenic harm.

Papers supporting "scientific" aspects of NICO have been published in peer-reviewed mainstream journals. The publications offer changing explanations with only anecdotal case reports and no definitive etiology, biochemistry, histopathology, neuropathology or diagnosable clinical features meeting scientific standards of proof, while advocating repeated surgical procedures for diagnosis and therapy,<sup>10</sup> also without proof of effectiveness. At present, the existence of

NICO as a clinical entity remains unproven and unaccepted by the majority of science-based practitioners.<sup>11,12</sup> NICO must be evaluated by well-designed studies; until then, unproven concepts should not be the basis for invasive dental surgical procedures.

The dubious theory of NICO surgery has been promoted beyond reason by some practitioners as a cure for arthritis, heart disease, immune disorders and many pain conditions, again without supporting evidence. The concept of surgically detecting and removing jawbone “cavitations” has been further expanded to advocate removal of all root canal-treated teeth and even vital teeth close to the “cavitation” or “toxic areas.”<sup>13</sup> A dentist was issued a Letter of Censure by a provincial regulatory authority for proposing to extract 6 teeth restored with root canal fillings based on the diagnosis of pathological jawbone cavities — cavities that a panel of dentists could not detect clinically or radiographically.<sup>14</sup> Tragically, the death of an avid believer in unconventional medicine (UM) who died of recurrent disseminated breast cancer was attributed to jawbone “cavitations” by UM supporters.<sup>15</sup> NICO is an example of unconventional dentistry (UD) that is less conservative, more invasive, riskier, less effective and more expensive than conventional dentistry.

### Craniosacral Therapy

A common body-based manipulative therapy promoted for oral facial conditions and many systemic disorders,<sup>16</sup> craniosacral therapy (CS) or cranial osteopathy was reportedly invented in the 1930s by an osteopathic physician who published his article under a false name.<sup>17</sup> CS theorizes that the brain makes rhythmic movements that can be felt as cranial pulsations by trained practitioners, and that cranial sutures restrict these periodic pulsations causing a variety of diseases, deformities and dysfunctions. Hands-on techniques such as tapping or gently massaging the skull are said to “free up” the cranial sutures and allow the body to return to normal. Variants of CS are promoted by osteopaths, physical therapists, chiropractors (e.g., craniopathy, neural organizational technique) and dentists.<sup>18</sup>

There is no scientific basis or documentation for the existence of a craniosacral rhythm, and the theory that manipulating the skull can cause the bony cranial sutures to move and to cause healing or repair deformity is unsubstantiated and illogical. A narrative review of CS resulted in the conclusion that the literature on cranial bone motion was “scant and inconclusive.”<sup>19</sup> Attempts to detect a craniosacral rhythm showed no relationship to heart or respiratory rates and inconsistent results by trained CS practitioners.<sup>20,21</sup> In conclusion, the literature noted the possibility that the “perception of craniosacral rhythm is illusory.”<sup>21</sup> A scientific advisory committee of the Insurance Corporation of British Columbia found no empirical evidence of effectiveness of CS.<sup>22</sup> CS has been described as “more a belief system than a science.”<sup>18</sup>

Dental claims and uses of CS defy science and logic. CS is promoted for correction of malocclusion, temporomandibular disorders (TMJ dysfunction) and “revitalization” of tooth pulp

to eliminate the need for root canal treatments or extractions.<sup>23</sup> Pseudoscientific Internet sites promoting CS in dentistry are examples of the language of quackery.<sup>24</sup> CS in dentistry is described as faith healing.<sup>18</sup> CS may be perceived as helpful because of placebo effects and the relaxing CS environment. Because of the lack of any substantial research and the lack of any evidence of effectiveness, there is no basis for the use of CS in dentistry.

### Acupuncture

Acupuncture describes a range of procedures (manual needling, electric, moxibustion, pressure, heat, laser) that stimulate certain points on or near the skin, based on the ancient Chinese medical philosophy that the disruption of a normal pattern of energy flow (*Qi*) is responsible for disease; acupuncture corrects imbalances of *Qi*. There are over 2,000 acupuncture points arranged on “meridians” representing channels of energy flow. Traditional Chinese medicine does not correlate with scientific medicine, and acupuncture is widely used, popular and controversial in North America. A consensus conference on acupuncture, as reported by the U.S. National Institutes of Health in 1997,<sup>25,26</sup> concluded that although there is a considerable body of international acupuncture literature, there is a paucity of well-designed research meeting contemporary scientific standards.

Acupuncture analgesia has been demonstrated in controlled laboratory studies to produce greater analgesia than appropriate placebos.<sup>27</sup> The mechanism of acupuncture has been hypothesized as counter-irritation analgesia. “Hyperstimulation analgesia”<sup>27</sup> is a brainstem mechanism in which a brief, intense stimulation of afferent nerve fibres to brainstem inhibitory control structures modulates pain transmission in a feedback loop mechanism,<sup>27</sup> activating both opioid and non-opioid systems.<sup>28</sup>

Dental applications of acupuncture are promoted primarily for pain relief (surgical, acute and chronic), as well as for a range of human disease. Well-designed studies of acupuncture in dentistry are lacking and effectiveness is unproven.<sup>29,30</sup> Significant problems in the reporting of traditional Chinese medicine and acupuncture have been identified.<sup>31</sup> A controlled study found that electroacupuncture of the ear was no more effective than placebo touching against chronic pain.<sup>32</sup> The efficacy of acupuncture against chronic pain has been assessed as “doubtful.”<sup>33</sup>

Risks from acupuncture have been reported, including rare fatalities, serious infection (HIV, hepatitis, subacute bacterial endocarditis), anatomical trauma (pneumothorax, cardiac tamponade) and electroacupuncture suppression of a demand cardiac pacemaker.<sup>34</sup> Acupuncture remains an unproven modality of treatment and there is no scientific evidence of effectiveness against any disease.<sup>35</sup> The only evidence-based effectiveness of acupuncture is against nausea.<sup>25,36</sup> Dentists should be cautious, should be well trained and should use appropriate technique if providing dental acupuncture for anesthesia or analgesia. Standards of care will evolve because

acupuncture is a regulated profession in at least 32 American states,<sup>35</sup> Britain and British Columbia.

## Homeopathy

Homeopathy is an unconventional system of medical practice based on principles developed in the 18th century. The principles of homeopathy include the belief that disease represents a disturbance in the body's ability to heal itself. "Remedies" are determined by noting the symptoms produced by large doses of a substance in a healthy individual and applying these substances in highly diluted doses to relieve the same symptoms (the "law of similars" — "like cures like" — and the "law of infinitesimals" — the smaller the dose the more powerful the effect).<sup>37</sup> Neither of these "laws" has been proven, leaving no basis for homeopathy. Homeopathic remedies are made from various sources (mineral, botanical, etc.) in the form of liquids, spherical pellets or tablets according to the Homeopathic Pharmacopoeia of the United States. The substances are diluted with alcohol or distilled water and vigorously shaken, or ground and combined with lactose. These substances are then further diluted to concentrations ranging from 1/10<sup>5</sup> to 1/10<sup>30</sup>,<sup>37</sup> violating a basic law of chemistry that limits the dilution that can be made without losing the original substance altogether (Avogadro's number, 6.023 x 10<sup>23</sup>).

Although the principles of homeopathy have been refuted by basic science and medicine, homeopathic remedies are promoted by physicians, dentists, pharmacists, naturopaths, health food stores and a variety of unregulated sources. Reviews of controlled studies of homeopathic remedies found insufficient evidence that homeopathy is efficacious for any clinical condition;<sup>38-40</sup> however, the clinical effects of homeopathy were reportedly not completely due to placebo.<sup>40</sup> At present, although well-designed research on homeopathy may be warranted, funding is difficult to justify for a treatment lacking a rational basis.

Dental promotions for homeopathy range from treatment of fear and anxiety, TMD, facial paralysis, aphthous ulcers, toothache, infections, bad breath and periodontal disease to counteracting the effects of mercury amalgam fillings and x-ray exposure,<sup>41</sup> yet there is no evidence that homeopathy is effective for any dental use. Homeopathic remedies appear relatively benign and probably pose no significant risk for a basically healthy patient;<sup>42</sup> however, irrational health care is not harmless.

## Holistic/Biological Dentistry

The concept of holistic health care is widely accepted. Traditional dental education teaches a multidisciplinary approach to total patient well-being in the diagnosis, management, prevention and treatment of a wide range of oral and dental disorders. Adopting a humanistic philosophy and considering the whole patient, including both physiologic and behavioural disorders, is traditionally taught as ethical, moral and consistent with and dependent upon scientific standards of dentistry.

Holistic dentistry" (HD, sometimes called "biological dentistry"), however, has become a concept remote from scientific practice, advocating the use of unscientific and unconventional methods to diagnose, treat, prevent or cure a wide range of disorders, many of which are not dental and are not related to dentistry.<sup>43</sup> Many of these methods are used to "treat" chronic conditions that scientific medicine cannot yet cure. HD is a collection of attitudes, beliefs and a wide range of practices, not a defined system of treatment. Holism is a legitimate concept that has become a marketing term for quackery.<sup>44</sup>

Among the major promotions of HD are NICO, "amalgam toxicity," focal infections from root canal therapy and "oral galvanism" causing systemic medical disorders. These unproven theories are somehow related to electrodiagnostic and other unproven "biocompatibility" tests that identify dental treatment needs and show appropriate materials to be used in dentistry. The controversies about the unproven "amalgam mercury toxicity" scare and the HD protocols for amalgam removal and "mercury detoxification" are best summarized by the World Health Organization report<sup>45</sup> indicating that the overall toxic risk of amalgam fillings is very low, allergic response is rare, and removal of amalgam fillings on the grounds that health may improve as a result is unethical. The techniques and procedures of HD include many fringe practices promoted by pseudoscientific jargon.<sup>46,13</sup> Details are beyond the scope of this paper.

HD is neither recognized nor approved as a dental specialty. Because of the concern for HD practices having no documented evidence of effectiveness, being so remote from scientific dentistry and having harmful consequences, dentists should be cautioned that some HD practices may go beyond the definition of the practice of dentistry.

## Unconventional Oral and Dental Care Products

A variety of products are promoted for oral and dental uses as alternative to standard commercial products.<sup>47</sup> Products are marketed to address the increasing public interest in UD/UM. These products can be classified into 4 groups:

1. *"Natural" standard products* are formulated from "naturally derived" components. This group includes "natural toothpaste," in which the fluoride may be derived from fluorspar, the abrasive may be derived from calcium carbonate (chalk) and the thickening may be a seaweed derivative (kerageenan). Some of these products do not contain fluoride, and beneficial claims have not been substantiated in clinical trials.
2. *Herbal products* feature herbal extracts to yield an "active" ingredient. Few of these compounds have had their effectiveness demonstrated in toothpaste formulations. Some products contain polyphenols found in green tea due to purported antimicrobial effects. Tea tree oil, chamomile, echinacea, myrrh, fennel, ginger, licorice root, witch hazel, nettle leaves, watercress, clove oil and eucalyptus, as well as Chinese herbal products and Ayurvedic herbal preparations, are included in herbal dental products. Herbal products have

also been marketed for the management of bad breath. Sanguinaria extract, a derivative of *Sanguinaria canadensis* (bloodroot) has been incorporated in oral rinse and tooth-paste products with evidence of safety and effectiveness,<sup>48,49</sup> although recent reports of concerns are emerging.<sup>50</sup>

3. *Homeopathic remedies* have also been promoted for oral care. Reports of controlled studies with homeopathic products for oral care have not been identified.
4. *Synthetic "alternative" products* include synthesized compounds often derived from essential oils such as phenolic compounds (thymol, eucalyptol, eugenol, menthol and phenol). These agents are primarily disinfectants and may act to provide topical anesthesia; however, there is no evidence of intraoral disinfection when used in oral preparations.

Some products contain ingredients from more than one of the above groups. Products are frequently marketed on the basis of the individual components in the product and cite laboratory studies of the action of individual agents. These studies are often not based on scientific evidence of the agents in the form that they are used in the oral care product. As an example, a product promoted for the management of halitosis includes a combination of parsley and cottonseed oil. Because this product is marketed as a "dietary supplement," evidence of safety and efficacy against halitosis is not required.

Promoters of unproven oral and dental products should be encouraged to conduct controlled studies with adequate design to prove safety and efficacy. With such studies, dentists can provide information to patients and guide them in the selection of safe and effective products.

## Lessons

Promoters of UD/UM must be held accountable to document acceptable, outcome-based, reproducible studies as proof of safety and effectiveness. Dentists, physicians and patients are all susceptible to promotions; we must understand the need for and demand scientific evidence before advising or accepting any health care promotions. ❖

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