

# **Ancient Tongue Diagnosis For The Modern Hygienist**

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Traditional Chinese Medicine is well accepted in the mainstream of medical care throughout East Asia, but it is still considered an alternative medical system in much of the Western world.<sup>1</sup> As biological dental professionals, we are concerned with the whole health of our patients, and learning about the ancient art and science of tongue examination and diagnosis from traditional Chinese medicine can expand our knowledge and ability to help our patients achieve optimal health.

Central to the philosophy of Chinese medicine is that health is more than just the absence of disease. The balance of mind, body, and spirit are the foundations of a good life. Traditional Chinese medicine is based on the theory that all of the body's organs support one another synergistically, and that in order to achieve optimal health, all of the organs must be in balance.<sup>2</sup> The premise of traditional Chinese medicine is that health is determined by a balanced flow of three substances: Qi (which is the manifestation of energy), blood, and body fluids.<sup>3</sup> Illness is thought to be a result of stagnation, deficiency, or improper movement of Qi, blood or fluids, which may cause an imbalance and disharmony in the body.<sup>4</sup>

In traditional Chinese medicine, the tongue is believed to be connected to the organs of the body through meridians, which are energy pathways. According to the principles of traditional Chinese medicine, analyzing the appearance of an individual's tongue can provide a deeper understanding of overall health.<sup>5</sup> Tongue examination has been practiced for thousands of years. Ancient writings dating from the Shang Dynasty (1600 BC to 1000 BC) describe disharmonies of the body that could be determined by the

presentation of the tongue.<sup>6</sup> The tongue is a very significant source for diagnosis of disease because it's the only external organ of the body that gives visual indicators of the condition of internal organs.<sup>7</sup> Therefore, practitioners of traditional Chinese medicine treat the tongue as a mirror of one's health.

According to traditional Chinese medicine, the tongue provides a map of the organ systems.<sup>8</sup> By observing the various regions of the tongue, one can determine where the disease is located within the body. There are five organ networks on which traditional Chinese medicine is based:

- Lungs and colon.
- Spleen and stomach.
- Heart and small intestine.
- Kidneys and bladder.
- Liver and gallbladder.

When the organ networks are in a state of imbalance, the patient will demonstrate disharmony manifesting as symptoms.

In traditional Chinese medicine, different areas of the tongue are thought to be related to various meridians and to reflect the health of five organ systems: the heart, lungs, liver, kidney, and spleen.<sup>9</sup> Specifically, the tip of the tongue relates to the heart, the next portion behind the tip is related to the lungs, and the center is connected to the stomach and spleen. The back of the tongue is connected to the large and small intestines, the kidneys, and the urinary tract. The lateral borders of the tongue are related to the liver and the gallbladder.<sup>10</sup>

One of the foundational principles of traditional Chinese medicine is that the tongue has a special relationship with the heart, in that the heart opens to the tongue. The tongue is said to be an "offshoot of" or "flowers into" the heart.<sup>11</sup> The tongue is also said to be a reflection of a person's overall harmony or disharmony, so healers observe the tongue in relation to emotional as well as physical health.<sup>12</sup> Examination of the tongue can reveal a multitude of ailments from gut issues to sleep deprivation to hormonal imbalance.<sup>13</sup>

## Basic Tongue Anatomy

The tongue is a skeletal muscle that is very metabolically active. It is innervated by a rich supply of blood vessels and nerves, lymphatics and secretory glands. The covering of this muscle is squamous epithelium with a rapid rate of turnover. It's this heightened metabolic activity that makes it an optimal tool for diagnosis.<sup>14</sup> The tongue has many functions, including facial development, maintaining the airway, assisting with chewing, swallowing, digestion, and speech.<sup>15</sup>

A normal, healthy tongue should be pink, and the dorsal (top) surface, evenly covered with small filiform papillae. The filiform papillae give the tongue its texture and are responsible for the sense of touch. Unlike other types of papillae, the filiform papillae do not contain taste buds. The filiform papillae are cone shaped and whitish due to the keratinization of their epithelium. The filiform papillae are more elastic and more firm than other types of papillae due to the elastic fibers they contain.<sup>16</sup>

Fungiform papillae are club-shaped and are generally a darker pink or red color. They are found on the tip and lateral borders of the tongue and interspersed among the filiform papillae on the dorsal surface. Taste buds, the receptors of the gustatory sense, that distinguish sweet, sour, salty, bitter, and umami are located on the upper surface of the fungiform papillae.<sup>17</sup>

Folate papillae appear as short, vertical folds on each side of the back of the tongue, just anterior to the lingual tonsils. They have been described as leaf-like folds and due to the fact that they are not covered in keratinized epithelium; they are soft and bear numerous taste buds. They have a tendency to swell and because they are located on the posterior region of the lateral border of the tongue, which is a common site of oral cancer, they are often mistaken for tumors.<sup>18</sup>

On the posterior surface of the dorsum are the slightly bigger circumvallate (or vallate) papillae. These are dome-shaped structures that vary in number from eight to 12 and form two lines across the posterior of the dorsum of the tongue.<sup>19</sup>

The lingual papillae are thought to serve the purpose of increasing the surface area of the tongue, allowing for optimum control of the food bolus and of taste sensations.<sup>20</sup>

## **Tongue Examination & Diagnosis**

The aspects of the tongue considered in diagnosis include the following:<sup>21</sup>

- Tongue spirit or vitality.
- Body color.
- Body shape.
- Tongue coating.
- Tongue moisture.

In addition, various features are also considered, including absence or presence of and the characteristics of movement, bristles, cracks, and teeth marks.

### **Tongue Spirit or Vitality**

Spirit or vitality reflects good energy, moisture, and blood.

- Thriving: The tongue will be soft, flexible, and moist.<sup>22</sup>
- Withered: The tongue will be dry, stiff, and emaciated.<sup>23</sup>
- Quivering: This signals a chronic condition that has drained the body of energy and has resulted in extreme fatigue. Symptoms of stuck energy may include sluggish bowels, weight gain, difficulty losing weight, bloating and feeling heaviness in limbs;<sup>24</sup> a trembling tongue may accompany conditions such as underactive thyroid, polycystic ovarian disease or chronic fatigue syndrome.<sup>25</sup>

### **Tongue Body Color**

The tongue body color indicates the condition of blood, energy, and body fluids in the heart, spleen, lungs, kidneys, and liver. It also shows any long-term pathological disharmonies of chronic diseases.<sup>26</sup> Changes in tongue color are said to indicate chronic illness. In general, a deeper color indicates

more heat, which could be a result of inflammation, infection or hyperactivity in an organ. A very light color would indicate the opposite. It could mean your immune system is low, which may be the result of overwork or excess stress.<sup>27</sup>

## **Normal**

Pink to light red with some visible vasculature on the ventral (under) surface.<sup>28</sup>

## **Red**

- Indicates excess heat (inflammation, infection, or hyperactivity) or deficient heat (hyperthermia, decreased function).<sup>29</sup>
- Symptoms may include feeling hot, perspiration, red face, constipation, pungent dark stool, increased hunger, emotional imbalance, menstrual irregularities, difficulty falling asleep, vivid dreams.<sup>30</sup>
- May be connected to hyperactive thyroid, high blood pressure, menopause, or an allergy to food or drugs.<sup>31</sup>
- Indicates an imbalance in the heart, a possible sign of cardiovascular disease.<sup>32</sup>
- A red tongue with a thick yellow coat or swollen (hypertrophic) papillae indicates excess heat.<sup>33</sup> (Hypertrophic papillae may be a result of mechanical irritation or a reaction to upper respiratory infection.)
- With a bright shiny coat or no coat (depapillation) indicates deficient heat.<sup>34</sup>
- A red, shiny tongue may indicate spleen, stomach, and kidney disease.
- Depapillation, or the loss of lingual papillae, results in a smooth, red, and possibly sore area. It is seen in geographic tongue, median rhomboid glossitis, and atrophic glossitis or glossodynia. Symptoms may be burning or soreness, as well as strong emotion, fatigue or insomnia.
- Nutritional deficiencies in B vitamins, iron, and folic acid can cause depapillation.
- Food allergies and sensitivities will be likely.

- Geographic tongue causes a map-like pattern of reddish areas with a white border to develop on the dorsum of the tongue. The patches may shift and the pattern may change over time. It is usually harmless.<sup>35</sup>
- May also be a sign of Scarlet fever, along with a strawberry-like appearance (red and bumpy) – typically, accompanied by a high fever.<sup>36</sup>
- May also be a sign of Kawasaki disease – it's usually seen in children under the age of 5 and is accompanied by a high fever.<sup>37</sup>

### **Bluish-Purple or Reddish-Purple**

- A reddish-purple tongue indicates heat and blood stagnation (poor circulation).<sup>38</sup>
- A dry, dark reddish-purple tongue may indicate depleted fluids due to excess heat (dehydration).<sup>39</sup>
- A light purple, bluish-purple, or greenish purple tongue may indicate cold (hyperthermia) and blood stagnation (poor circulation).<sup>40</sup>
- Symptoms may include body aches and pains, joint, neck and shoulder stiffness and pain, chest pain, headaches, or menstrual pain with blood clots and brownish bleeding.<sup>41</sup>
- May indicate cardiovascular disease, polycystic ovarian syndrome, endometriosis, migraines, eczema, and arthritis.<sup>42</sup>

### **Pale**

- May indicate an issue with the pancreas or digestive function, reduced energy, and poor blood flow.<sup>43</sup>
- Seen in conditions of excess stress, such as when undergoing chemotherapy.<sup>44</sup>
- Can be caused by eczema.<sup>45</sup>
- Symptoms may be lack of energy, pale skin, low blood pressure, dizziness (especially on standing), excessive perspiration, shortness of breath, fatigue, anemia, bruising, sluggish bowel movements, bloating after eating, scanty menstrual periods, infertility, frequent miscarriage, and little to no milk production after delivery.<sup>46</sup>

## **Yellow**

- Indicates bacterial overgrowth due to poor oral hygiene or dehydration – it can also signal stomach dysfunction.<sup>47</sup>
- May be caused by jaundice.<sup>48</sup>

## **Orange**

- Poor hygiene or dehydration.<sup>49</sup>
- Caused by certain foods high in beta carotene.<sup>50</sup>

## **White**

- May be caused by fungal infection such as oral thrush, which can be painful and cause thick white or red patches to form on the tongue; may make swallowing and eating difficult.<sup>51</sup>
- May result from leukoplakia, which results in white patches or plaques on the tongue. Often this is a result of irritation from smoking or parafunctional habits like tongue chewing.<sup>52</sup>
- Might be due to lichen planus, which appears as a lacy pattern or white patches and are typically benign but can become malignant.<sup>53</sup>

## **Black**

- Caused by keratin build up on the tongue, and elongated papillae can look hairy – may be the result of poor oral hygiene, tobacco use, radiation therapy, or certain medications, such as antibiotics.<sup>54</sup>
- Deposits from certain beverages such as coffee, black tea or red wine.<sup>55</sup>

## **Tongue Shape**

The shape of the tongue reflects the state of the blood, the energy, and the nutrition.

- **Normal:** Neither excessively large or thick, nor too thin, and fits comfortably inside the arches of the teeth and rests softly against the palate.<sup>56</sup>
- **Curled-up Sides:** Indicative of a stagnant liver.<sup>57</sup>
- **Enlarged:** Can indicate heart, kidney, stomach, and spleen heat,<sup>58</sup> or excessive alcohol consumption.<sup>59</sup>
- **Swollen:** Swollen tongue may indicate fluid metabolism is off-balance, which can affect emotions.<sup>60</sup>
- **Partially Swollen or Localized Swelling:** May reflect a deficiency in Qi (energy) or blood stagnation (poor circulation).<sup>61</sup> Relates to a problem with the organ(s) associated with that area – for example, a tongue with swelling of the lateral borders would indicate a problem with the liver or gallbladder or swelling of the tip of the tongue may point to a heart problem.<sup>62</sup>
- **Pointed Tip:** Heart fire.<sup>63</sup>
- **Curled-up Tip:** Heart blood deficiencies.<sup>64</sup>
- **Curled-under Tip:** Heart heat.<sup>65</sup>
- **Notch at Tip:** Heart blood deficiencies.<sup>66</sup>
- **Hammer-shaped:** Result of swelling of the sides of the front half or front third of the tongue.<sup>67</sup> Indicates a serious condition of the spleen, stomach or kidney.<sup>68</sup> May also indicate mental illness.<sup>69</sup>
- **Scalloped:** May be also called macroglossia where the lateral margins of the tongue are scalloped from the indentations of the teeth.<sup>70</sup> Indication of an airway issue. (The tongue is being pushed outward in an attempt to open the airway, and the scalloping occurs as a result of pressure of the tongue against the teeth.)<sup>71, 72</sup> May indicate an acute lack of energy from a spleen deficiency. (Tongue muscle may be overly relaxed with the teeth literally imprinting their shape on the tongue as they hold the tongue in place.)<sup>73</sup> Common finding in a variety of conditions, including food allergies and sensitivities, microbial dysbiosis (SIBO or lower gastrointestinal disorders), poor digestion and micronutrient deficiencies as seen in Celiac disease, and intestinal permeability.<sup>74</sup> Other conditions include high cholesterol, metabolic disorders, chronic fatigue syndrome, fibromyalgia, hypothyroidism, gluten-induced inflammatory arthritis, and Down syndrome.<sup>75</sup>



- **Short:** May be the result of a short frenum attachment (ankyloglossia), and is related to difficulties with breastfeeding, eating, and speech.<sup>76</sup> If it also has a sticky coating, may indicate excess phlegm.<sup>77</sup> If it is also red and dry, may be excessive heat and dehydration.<sup>78</sup>
- **Contracted:** If it is also moist and pale, indicates stagnation in the meridians or spleen deficiency.<sup>79</sup>
- **Long:** Considered long if there is difficulty in retracting it.<sup>80</sup> May reflect heart inflammation or generalized excessive inflammation.<sup>81</sup>
- **Thin:** May indicate inadequate nutrition and dehydration.<sup>82</sup> May reflect low energy.<sup>83</sup>
- **Stiff:** Generally indicates excess and is connected to gas and bloating.<sup>84</sup> Difficult to move (protrude, retract, lateral excursions), which may result in speech abnormalities.<sup>85</sup> If accompanied by a bluish-purple tongue body, may indicate an impending stroke.<sup>86</sup> If accompanied by a thick sticky tongue coating, usually indicates diseases and symptoms related to heart arteries such as dizziness, coma, stroke, emotional outbursts as seen in manic-depressive disorder, convulsions, sudden sensory loss (blurred vision, deafness, loss of taste and smell and ability to speak), and dementia.<sup>87</sup>
- **Flaccid:** Weak and lacks strength.<sup>88</sup> If also pale, usually indicates energy and blood deficiency, often a result of poor nutrition or hormone imbalance.<sup>89</sup> If also dark red, dry, and has cracks, usually indicates extreme inflammation or infection in the body.<sup>90</sup> If also scarlet, usually indicates imbalance in the intestines and may result in exhaustion of Yin, or calming energy.<sup>91</sup>
- **Fissured:** Also described as a cracked tongue. Often presents with geographic tongue in those with psoriasis and Sjogren's syndrome.<sup>92</sup> Associated with digestive issues involving the stomach or intestines.<sup>93</sup> Can indicate problems with the spleen or with nutritional deficiencies, including B12, B6, Folate, iron, niacin, and vitamin A.<sup>94</sup> Deep fissure down the center to the tip may indicate heart pathology.<sup>95</sup>

## Tongue Coating

The tongue is coated with a microbial biofilm of various causes. It can be a result of dehydration, which gives the coating a dry, parched appearance, or consumption of foods and beverages such as coffee, that leave a colored

coating. It can also be caused by bacterial or yeast dysbiosis from the gut or oral microbiome. When observing the coating, which is sometimes referred to as “moss,” consider the thickness, the color, and the consistency.<sup>96</sup> The tongue coating is an indicator of the condition of the small intestine, large intestine, stomach, gallbladder, and urinary bladder. The tongue coating can point to acute conditions. Its thickness indicates excess or deficient states.<sup>97</sup>

## **White**

- Thin, white, slightly moist coating – normal.<sup>98</sup>
- Thick white coating – may be caused by a yeast overgrowth called oral thrush and appear as white patches that may be the consistency of cottage cheese; commonly seen in infants and the elderly, especially denture wearers or those with weakened immune systems; also seen in people with diabetes and those taking inhaled steroids for lung disease and asthma; is likely to occur after taking systemic antibiotics that cause dysbiosis in the gut microflora.<sup>99</sup>
- White patches on the tongue and other mucosal surfaces of the mouth can develop as a result of irritation; can be caused by tobacco products or by parafunctional habits such as tongue chewing.<sup>100</sup>
- May appear as raised white lines on the tongue (oral lichen planus) or other mucosal surfaces of the mouth; is an inflammatory process that may cause pain, burning and other discomfort and, in rare cases, may become cancerous.<sup>101</sup>

## **Yellow**

- Caused by excessive heat, which results in internal damage and is related to stomach and intestinal conditions; the deeper the color, the stronger the pathogen.<sup>102</sup>
- A thick yellow coating right in the center of the tongue indicates dehydration and an inability to properly digest food.<sup>103</sup>
- Symptoms that may appear are body heat, perspiration, odor, halitosis (bad breath), yellow urine, constipation, dark or pungent stool, gas, bloating, red face, nightmares, insomnia, or vivid dreams.<sup>104</sup>

- May be seen in patients with diabetes, high cholesterol, high blood pressure, liver disease, or gallbladder disease.105

### **Grey or Black Coat**

- With excessive moisture, indicates extreme cold.106
- With excessive dryness, indicates extreme heat.107
- Black hairy tongue occurs with extreme dysbiosis in oral microbiome. The papilla become excessively long and hair-like, and harbor bacteria that can become dark or black; can be a result of poor oral hygiene, diabetes, those taking antibiotics or those receiving chemotherapy.108

### **Thick, Greasy Coat**

- Indicates excessive dehydration, poor diet, and inflammation; the thicker the coating, the stronger the pathogen.109
- Indicates the presence of toxins due to deficient or defective digestive enzymes.110
- Symptoms may be a lack of energy, bloating, weight gain, stiff joints, and sluggish bowels.111
- Thin coat that becomes thick indicates the disease is progressing, becoming more severe.112
- Thick coat that becomes thin indicates that the disease is waning, the patient is healing.113

### **Uneven Coat**

- Can be caused by dehydration, = stomach and liver disorders, and gastric ulcers.114
- Symptoms may include heartburn, stomach pain, dry skin, pain on one side of the body, interrupted sleep, and vivid dreams.114

## **Tongue Moisture**

- Tongue moisture indicates the state of hydration or body fluids. Depletion of water volume can lead to peripheral circulatory failure characterized by a dry, parched tongue, increased thirst, weakness, restlessness, anorexia, nausea, and vomiting.115
- Normal is slightly moist.116
- Dry tongue body is seen in diarrhea, advanced uremia, acute intestinal obstruction, and heat exhaustion.117
- In dehydration, the tongue feels and looks dry; symptoms may include dry skin, hot flashes, constipation, heartburn, hunger, vivid dreams, and insomnia.118
- May have hyperactive thyroid, menopause, high blood pressure, depression, anxiety, or gastric ulcers.119
- Excess wet tongue body may indicate the spleen is not functioning properly.120

This is a very simplified guide to tongue diagnosis. Each of these characteristics can be considered in much more specific detail. For example, a patient may present with a stiff tongue with a general purple body color, with deeper reddish purple on the tip, and a sticky, white, rootless coating. This patient may be diagnosed with cardiovascular disease, poor circulation, and stomach deficiencies. In order to be able to fully interpret all of the varied and detailed characteristics that can be identified on the tongue, further study into traditional Chinese medicine tongue diagnosis is required.

## **Methods and Cautions**

- Sunlight will give the most accurate color reading of the tongue body and coating.122
- The tongue should be extended in a relaxed manner and not held out stiffly or for an extended period. Usually the tongue is examined for 15 seconds at a time. Extending the tongue for longer periods may cause changes in tongue shape and color.123

- Food and beverages, including coffee, tea, beets, food made with artificial colorings, and vitamin C may alter the color of the tongue coating.<sup>124</sup>
- Tongue brushing or scraping may affect diagnosis. Ask patients to refrain at least on the day of their examination, but a full 24 hours prior is ideal.<sup>125</sup>
- The time of year may affect the condition of the tongue coating. In summer, there may be more dampness, which will result in a thicker, light yellow coating. In autumn, the coating may be drier and thinner. In winter, there may also be excessive moistness in the tongue, which will result in a thick, light yellow coat. In spring, the tongue should be normal.
- Time of day may also affect the tongue. The coating generally becomes thicker as the day progresses, while the color becomes redder and shinier. Ideally, the tongue should be examined first thing in the morning, before eating.<sup>126</sup>
- Age affects the tongue in different ways. The elderly may present with more dryness and cracks on the surface of the tongue due to deficiencies in energy and nutrition. Infants tend to have a thick white coating on their tongues.<sup>127</sup>
- Overweight patients usually have more phlegm and their tongues may be larger and lighter in color as a result. Thin people tend to have redder tongues.<sup>128</sup>
- Some disorders are not revealed by a tongue diagnosis. Traditional Chinese medicine practitioners use tongue diagnosis as one part of a comprehensive examination, so it's important not to rely on tongue diagnosis alone in evaluating a patient's health.<sup>129</sup>

Although it's been used in traditional Chinese medicine for thousands of years, tongue diagnosis and its validity as a medical assessment tool haven't been thoroughly explored in scientific studies.<sup>130</sup> Practitioners of the art believe that the tongue nearly always shows the true condition of the patient.<sup>131</sup> Preliminary research suggests that tongue diagnosis shows promise as a means of evaluating certain measures of health in patients with conditions like rheumatoid arthritis<sup>132</sup> and breast cancer.<sup>133</sup> There is growing interest in tongue diagnosis, as well as traditional Chinese medicine. Tongue diagnosis is a noninvasive tool that bridges the gap between Eastern medicine and Western medicine. More Western

healthcare practitioners are utilizing knowledge of tongue diagnosis for early detection and to supplement their traditional Western practices.<sup>134</sup>

Holistic dental professionals and their patients can benefit from the knowledge and understanding of tongue diagnosis.

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