

## The relationship between the pelvis and stomatognathic system: A position statement.

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An emerging theme within the evidence base of dental and structural healthcare professions is the presence of a relationship between the stomatognathic system and posture<sup>1-4</sup>. Symptoms of temporomandibular/cranio-mandibular disorders (TMD/CMDs) within the stomatognathic system vary but often involve pain in the jaw musculature, pain or difficulty when opening the mouth and chewing, headaches, and ear pain. While the pelvis and TMJ might seem to be distal and unrelated aspects of our patient's presenting symptoms, research is suggesting otherwise<sup>5-7</sup>.

The research does indicate there is a chain of kinematic factors functionally linking the structural components of the axial skeleton. Orthopedic studies have linked leg length to various physical problems, including sacroiliac misalignment<sup>8</sup>. Other studies (N=100) have found relationships between unilateral hip rotation range of motion asymmetry in patients with sacroiliac joint regional pain<sup>9</sup>. However, while patients with asymmetry of the sacroiliac joint can be relieved by various therapies<sup>10</sup> it is essential that the ascending to, or descending contribution from TMJ related occlusion and condylar position is considered. For instance in one study [N=157] a significant relationship was found between stomatognathic system in ankylosing spondylitis, which started in the sacroiliac region. "It was concluded that the ankylosing spondylitis group differed significantly from the control group with respect to mandibular mobility, tenderness to palpation of the temporomandibular joint and relation between the retruded and intercuspal position of the mandible<sup>11</sup>." They concluded that "occlusal factors may also be of importance for the development of clinical symptoms in the stomatognathic system in this group<sup>11</sup>."

Therefore it is not surprising with a subset of patients body distortions ascend from the feet, pelvis, spine, and neck to affect TMJ dynamics affected by dental occlusion<sup>12-13</sup>, condylar position<sup>14-15</sup>, and airway space<sup>16-17</sup>. With another subset of patients patterns of body distortions descend from TMJ dynamics affecting dental occlusion, condylar position, and airway space. It is postulated that most patients exhibit both ascending and descending characteristics and to make lasting improvement with TMD or pelvic function, co-treatment will be necessary.

The emerging evidence is indeed finding that relationships exist between ascending and descending contributions to CMD/TMD and postural dysfunctions. In one study (N=22) a correlation was found between foot motion, position of the innominate, and vertical facial dimensions<sup>18</sup>. In another study Tecco et al determined that an anterior cruciate ligament (ACL) injury may have an affect on muscle activity of head, neck and trunk muscles<sup>19</sup>. Apparently the spine's position can affect occlusion<sup>20-21</sup> and occlusion can affect the neck, spine and pelvis<sup>5,22</sup>.

Gregory notes "there are strong indications that the temporomandibular factors associated with malocclusion can result in sacroiliac dysfunction<sup>7</sup>." He concluded that "There appears to be a cause-effect relationship between external derangement-type TMD and sacroiliac sprain<sup>7</sup>." For instance in one case with craniofacial and TMD symptoms, low back pain, and sacral unleveling with a resulting ipsilateral shortened leg length, - resolution of all the symptoms and of the sacral base unleveling followed occlusal equilibration<sup>23</sup>.

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Interrelationships between dental occlusion, cranosacral, and sacroiliac joint function indicate that with imbalance to any of the structures some caution should be exercised before an irreversible procedure to any joint is performed<sup>23-24</sup>.

Chinappi and Getzoff point out that “the position of the jaw, head and vertebral column, including the lumbar region, are intricately linked<sup>25-26</sup>.” “Various rationales for the relationship between the spine or pelvis and TMJ have been found. These theories include fascial, myological interrelationships, referred pain patterns and facilitating tonic neck reflexes involving intersegmental spinal pathways<sup>27</sup>.” A contributing mechanism could be the “relationship between how TMJ occlusion, head position and body posture relate to the body’s natural neurological visual/vestibular righting mechanism<sup>28-29</sup>.”

Gordon discussed the functional and anatomical relationship between the jaw, head, cervical spine and pelvic complex in one study<sup>30</sup>. Fink et al, had twenty subjects undergo a procedure to create an artificial dental occlusal interference. They found a statistically significant occurrence of hypomobile functional abnormalities following the dental modification, specifically to the upper cervical spine and sacroiliac joint<sup>5</sup>.

Evaluating 45 asymptomatic subjects Sakaguchi et al concluded that:

1. Body posture was more stable when subjects bit down in centric occlusion.
2. Changes in body posture affected occlusal force distribution.
3. Altering body posture by changing leg length shifted the occlusal force distribution to the same side that had a heel lift<sup>15</sup>.”

In a clinical setting, when dental occlusion is developed and finished, body posture should be taken into account. "If a patient has a length discrepancy, hip rotation or any other problem altering body posture, occlusal contacts may differ

as the patient stands up and starts walking<sup>15</sup>.” “It was concluded that changing mandibular position affected body posture. Conversely, changing body posture affected mandibular position<sup>15</sup>.” While changing body posture appears to affect mandibular position<sup>15</sup>, a disequilibrated TMJ would be expected to have a significant affect on posture and the ability of the pelvis to respond to the effects of gravity.

In conclusion, it is important to assess the need for sacroiliac joint evaluation prior to treatment of dental occlusion or condylar position relating to TMD as well as assessing dental occlusion or condylar positioning prior to treatment of the sacroiliac joint<sup>31</sup>. Since the body is linked kinematically, specific regions shown to have intimate, yet distal, involvement such as the TMJ and pelvis, warrant close clinical attention. With a specific group of patients evaluation and treatment of the TMJ may be essential for a successful clinical outcome in treatment of the sacroiliac joint. Conversely with a subset of some patients, evaluation and treatment of the sacroiliac joint may be essential for a successful clinical outcome in treatment of the stomatognathic dysfunction.

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