

**Clinical Note**

# Hypnosis for Postradiation Xerostomia in Head and Neck Cancer Patients: A Pilot Study

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**Abstract**

Xerostomia, the sensation of dry mouth, affects almost all patients who undergo radiotherapy for cancer in the head and neck area. Current therapies for xerostomia are inadequate, and the condition negatively impacts the quality of life. This prospective observational pilot study aimed to evaluate whether hypnosis could improve salivation and decrease xerostomia. Twelve patients with xerostomia after radiotherapy for head and neck cancer were assessed for severity of xerostomia symptoms and sialometry. They then received a single hypnosis session with specific suggestions to increase salivation. The session was recorded on a compact disk (CD), and the participants were instructed to listen to it twice a day for one month. Sialometry was repeated immediately after hypnosis. Validated xerostomia questionnaires were completed at one, four, and 12 weeks after hypnosis. A substantial overall improvement was reported by eight patients at 12 weeks (66%). The saliva flow rate increased on sialometry in nine patients following hypnosis (75%). There was no correlation between the magnitude of changes in the measured saliva flow rate and changes in subjective measures (Spearman's correlation coefficient  $r = 0.134$ ). Symptomatic improvement significantly correlated with the number of times the patients listened to the hypnosis CD ( $r = 0.714$ ,  $P = 0.009$ ). No adverse events were reported. The data from this small observational trial suggest that hypnosis may be an effective treatment for xerostomia. Confirmation in a larger randomized and controlled investigation is warranted. *J Pain Symptom Manage* 2009;37:1086–1092. © 2009 U.S. Cancer Pain Relief Committee. Published by Elsevier Inc. All rights reserved.

**Keywords**

Xerostomia, dry mouth, radiation, salivation, hypnosis

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## Introduction

Each year, approximately 43,000 people are diagnosed with head and neck cancer in the United States.<sup>1</sup> Many patients receive radiation therapy delivered to the head and neck area, which results in injury to salivary glands, eventually leading to little or no saliva production. The amount of salivary flow reduction depends on the radiation dose and fractional size, as well as the volume of salivary glands irradiated.<sup>2</sup> Up to 100% of patients receiving radical radiotherapy develop some degree of xerostomia, the subjective sensation of dryness of the mouth. They also may have oral discomfort and pain, greatly increased susceptibility to dental caries, frequent oral infections, and difficulty in speaking, chewing, and swallowing. These outcomes can lead to severe oral disease, nutritional deficiencies, and an overall decline in quality of life.<sup>3</sup>

There are few treatment options for alleviating xerostomia in these patients. Salivary substitutes and sialogogues, such as pilocarpine,<sup>4</sup> are often tried. Submandibular gland transfer,<sup>5</sup> acupuncture,<sup>6</sup> and acupuncture-like transcutaneous nerve stimulation<sup>7</sup> have been suggested. These treatment modalities have shown various degrees of effectiveness and diverse side effects. Xerostomia continues to have a substantial negative impact on the quality of life of survivors of head and neck cancer.<sup>8</sup>

Medical hypnosis is the clinical application of hypnosis to medical disorders and procedures. As defined by the American Psychological Association, a hypnotic procedure is used to encourage and evaluate responses to suggestions.<sup>9</sup> Kihlstrom described hypnosis as "a set of procedures in which a person designated as the hypnoterapist suggests that another person (the patient or subject) experience various changes in sensation, perception, cognition, or control over behavior."<sup>10</sup> Others, such as Kirsch and Lynn,<sup>11</sup> described hypnosis as simply "a heightened state of relaxation or a state of focused attention." More recently, hypnosis has been conceptualized as a set of behavioral techniques.<sup>12</sup>

A hypnotic session usually has an induction phase and an application phase. During the induction phase, the individual begins to enter a hypnotic state, during which there are few competing cognitive demands and less self-

reflective thought.<sup>13</sup> This allows suggestibility, which is defined as "communication that is accepted uncritically."<sup>14</sup> During the application phase, specific suggestions are provided according to the treatment goals. Logistically, hypnosis is done in live sessions with a hypnoterapist facilitating the process. Another commonly used technique is teaching self-hypnosis at a formal session with a hypnoterapist, during which individuals learn how to enter the hypnotic state on their own. To achieve the latter goal, sessions are often recorded for regular practice at the client's home.<sup>15</sup> Whether facilitated by a hypnoterapist or carried out by the subjects themselves, it is generally agreed that all hypnosis is, in fact, self-hypnosis.

Several mechanisms have been suggested to explain how hypnosis exerts its effects. Electroencephalographic studies of hypnotic states show very slow high-range theta waves (5–7 Hz), which are typically associated with loss of executive control and reflect massive cortical inhibition.<sup>16</sup> On the other hand, when the hypnotic state involves specific stimulatory sensory or motor suggestions, the relevant sensory and motor areas of the brain may be activated even more than they are during nonhypnotic conditions.<sup>17</sup>

Salivation can be conditioned, as described in the classic studies by Pavlov.<sup>18</sup> Seeing certain foods or just thinking about food can trigger salivation in an expectant manner.<sup>19</sup> The anticipation of food, which constitutes the cephalic phase of alimentary secretions, has an effect on the magnitude of salivation. Subjects will demonstrate more salivation when they actually view a meal they expect to consume.<sup>20</sup> In addition, the cephalic salivation response is differential to specific foods. In one study, the greatest salivary increases occurred at the sight of lemon slices and pizza: both of them contain chemical irritants in the form of acids or pungent spices, which are powerful salivary stimulants.<sup>21</sup> Emotional input has also been shown to have an effect on the physiology of salivation:<sup>22</sup> specifically, emotional stress reduces salivation, whereas relaxation enhances it.<sup>23</sup>

Theoretically, using specific suggestions for relaxation combined with imagining food and/or environments which are known to encourage salivation may have a beneficial

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