

MECHANISMS FOR THE CONTROL OF VOCAL FREQUENCY

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It is well known that control of vocal frequency is determined primarily by variation in the mass and stiffness of the vocal folds and by subglottic pressure. In turn, variation of vocal fold mass and stiffness results (in part) from changes in vocal fold length. But how is vocal fold lengthening accomplished? There is no question but that the major control results from contraction of the cricothyroid muscle which reduces the CT space and, hence, stretches the vocal folds. However, this poster presentation challenges the notion that this, the CT, action is the only major factor in that regard.

In order to investigate these relationships, the following steps were taken. 1) Mean and maximum variations in vocal fold length were calculated from appropriate research reports. 2) Estimates of laryngeal cartilage size were obtained from the literature. 3) A variety of potential laryngeal cartilage dimensions were calculated. 4) Based on these values, a computer program was run that tested the effect of the CT mechanism on vocal fold length. It was found that the CT activity could not account for all of the lengthening observed. A complementary mechanism then was sought.

From examination of lateral radiographs, it has been observed that the shadows of the arytenoids appear to move posteriorly as a function of increases in F_0 . This apparent movement was measured on the X-rays of a number of subjects. The values obtained appear to account for the balance of vocal fold elongation. The results of some EMG studies support this explanation, the results of others do not.