

# VOICE, AGE AND GENDER

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## Summary:

Voice disorders are common and certain professions pose a higher risk, e.g. teachers for whom the risk is almost double that of the general population. Functional dysphonia occurs more often than organic dysphonia. Epidemiological data and an overview of social and cultural aspects concerning voice disorders are presented.

Voice during life is closely related to the person's physical and mental development, and changes take place in phases. The voice expresses our personality and emotions, and is the front piece of our gender identity. At the same time, the voice is the core of oral communication and is imbedded in a psychosocial and cultural context. Therefore, many aspects and factors play a role in the development of the voice during life. In fact, voice development starts already before birth when the foetus perceives sounds in the intrauterine environment. After the birth cry, the voice grows by the evolution from reflex to controlled voicing. This requires complex coordination of breathing, voicing and articulation. The vocal output adjusts and adapts in the context of communication, with communicative intention and linguistic requirements. Early vocal development prepares for efficient vocal communication with the bio-behavioural shift at about three months as a turning point. Simple sounds are turned into a complex communication structure. The vocal development in childhood is similar in boys and girls. At the onset of puberty, the child voice transforms into the adult voice during the phase of mutation. The phase of mutation is more fiercely in boys than in girls. The male and female voice develop differently and gender identity is realised. In the phase of mutation, the voice is vulnerable due to the need of constant repetitive adaptation to the growing voice apparatus. The adult voice turns into the voice of the elderly after the menopause in women and somewhat later in men. There are great inter-individual differences. The above described changes are a natural course. However, these changes may cause many problems, due to a.o. psychosocial factors. Custom holistic approach is needed to solve these problems in a satisfactory and durable way.

When a biological man chooses to live as a woman, it is obvious that also voice changes will be needed. The male and female voice is quite different. The question that arises is which aspects of the voice need to be changed for a person born as a man to be able to “pass” as a woman. The literature about differences in voice between males and females is substantial and there appear to be differences between the two sexes for almost every aspect of voice: pitch, loudness, resonance and voice quality. In addition, males and females differ in other aspects of communication such as articulation, speech rate, language, and non-verbal communication. Not all of the observed differences are equally important, however. Moreover, some aspects are quite difficult to change. There is no consensus among speech language pathologists serving transgender clients which aspects need to be addressed in therapy. The point of view defended in this presentation is that therapy should focus only on those aspects that are liable to change and really make a difference for listeners.

Phonosurgical operations to male and female transgenders have been offered since the beginning of the 80s with different surgical modalities that aim to raise the fundamental frequency of the voice. Operations available include cricothyroid approximation, Wendler operation to shorten the vocal folds and its modifications in addition to the Orloff laser assisted aiming to increase the tension of the lamina propria. In addition, a newly developed technique aims to rather reduce the vocal fold length as well as the inner diameter of the lower part of vocal tract. In this presentation, Helsinki modified version of the Wendler technique will be introduced. The technique includes modifications of both Wendler technique of shortening the vocal folds as well as Orloff laser cordotomy for increasing the tension of the vocal fold cover. In addition, long-term effects of the operation will be presented giving special attention to satisfaction of the operated patients, correlation between satisfaction and increase in fundamental frequency and voice handicap index. In addition, a remark on the need for revision for patients operated.

Knowledge of testosterone-induced voice changes in female-to-male (FTM) transgenders is rare, because FTM rarely access medical services because of voice problems. Some prospective investigations showed that a deepening of the voice started after a few weeks after beginning the cross-sex hormonal treatment with testosterone and reached a steady-state at the end of the first year of treatment. After one year, a voice deepening of approximately a sixth can be expected. In parallel with deepening of speaking fundamental frequency a decreasing of lowest and highest F0 is detectable. In contrast to the pubertal voice deepening in biological boys, no significant laryngeal growth has been described in FTM. Even though no exact information about the prevalence of voice disorders in FTM are available, voice lowering difficulties could be expected in about 10% of the cases, based on a larger investigation. These difficulties may cause in an insufficient testosterone dose, other organic/constitutional causes like reduced androgen sensitivity, or functional causes comparable with a prolonged mutation or mutational falsetto in biological men. Typical findings of voice changes in FTM in comparison to the literature will be presented.