

MATHEMATICS OF SNORING - REPRESENTATION OF THE ACOUSTIC PROCESS EXPRESSED BY A MATHEMATICAL MODEL.

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The inconvenience related to acoustic phenomenon which accompanies snoring process not only disturbs the environment of the patient but may also be a symptom of other sleep pathologies e.g. periodic respiratory inhibition thus it becomes a serious medical concern. Our proposed approach is to analyze the phenomenon of snoring using the methodology of mathematical modeling. Troublesome audible sound is the result of palate vibration which is in this context a form of mechanical system resembling a musical instrument. The fact of occurrence and the characteristic of the system vibration depends on its specific mechanical characteristics which are reflected in the mathematical model of the process. By application of time-frequency analysis even a short sample of the recorded sound of snoring can reveal these characteristics. Based on the response of a particular system (particular patient) we choose the overall structure of the system which ultimately through the examination of a wider population of patients and by applying correlative studies of anatomical features enables the development of a universal model. The proposed model can be used for the diagnostic purposes of the snoring process as it shows the impact of various medical parameters on its intensity and thus selection of appropriate