

# Introduction

Tinnitus is a symptom recognized for thousands of years. However, most definitions presently in use are neither sufficiently specific nor physiological in basis. Many definitions include objective sounds originating in the head and neck areas (*somatosounds*) and auditory hallucinations. This has frequently misdirected research clinical approaches. A definition of tinnitus as an auditory phantom perception was proposed in the early 1990s (Jastreboff, 1990, 1995); it is discussed here and used throughout this book. Decreased sound tolerance and its components hyperacusis and misophonia are defined and discussed. They frequently accompany tinnitus, similarly to hearing loss, but they do not have significant recognition in the literature.

## 1.1 Definitions of tinnitus

### 1.1.1 Commonly used definitions of tinnitus

Tinnitus is defined by the American National Standards Institute (ANSI, 1969) as “the sensation of sound without external stimulation.” Another common description was proposed in the Committee on Hearing, Bioacoustics and Biomechanics (CHABA) report *Tinnitus Facts, Theories, and Treatments*, which defines tinnitus as “the conscious experience of sound that originates in the head” (McFadden, 1982). Both definitions include the auditory hallucinations of schizophrenia, a variety of somatosounds such as palatal myoclonus, abnormal opening or patency of the eustachian tube, temporomandibular joint disease, spontaneous otoacoustic emissions and sounds (bruits) of vascular origin (see Ch. 6; Champlin, Muller & Mitchell, 1990; Harris, Brismar & Cronqvist, 1979; Hazell, 1990b; Hentzer, 1968; Jastreboff, Gray & Mattox, 1998; McFadden, 1982) as well as sensation resulting from a malfunction of the cochlea or auditory nerve (Jastreboff, 1990; Moller, 1984). Obviously, this broad definition invites a discussion of many different phenomena unrelated to tinnitus problems. Traditional definition of tinnitus as any sound generated within the head, without regard for underlying mechanism(s) or possible origin, invites discussion of phenomena unrelated to tinnitus problems and promotes categorization of tinnitus by symptoms alone.

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In the past tinnitus has been classified by various divisions, such as subjective/objective and peripheral/central tinnitus (McFadden, 1982). However, these categories were not clearly defined, and they involved significant overlap. Let us look at the most common division into *subjective* and *objective* tinnitus. Objective tinnitus (or some component of it) could be heard by an observer, and subjective tinnitus was heard by the sufferer alone. With better knowledge of the auditory system and better measurement techniques, some cases of tinnitus previously considered to be subjective can now be measured in an objective manner and heard after appropriate processing and amplification, for example patients with spontaneous otoacoustic emissions. These cases therefore become objective or at least have an objective component.

Another problem is that, while so-called objective tinnitus may be strongly associated with an audible generator, nevertheless, the perception resulting from such a source may be quite different, and in some cases not even detected by the owner. Certain spontaneous otoacoustic emissions can be detected by an external observer but are not perceived by the person generating them. It is impossible to predict if a given spontaneous otoacoustic emission is perceived or not, and a complex psychoacoustical approach is needed to associate spontaneous otoacoustic emission with perception of a sound (Penner, 1992; Penner & Burns, 1987). Classification into objective/subjective tinnitus is completely dependent on the sensitivity of the methods used to detect the somatosounds.

The definition proposed in the CHABA report results in a paradox. If it is understood as referring to sound originating in the head, then the majority of tinnitus cases would be excluded since there is no sound that can be detected. If the definition is understood as referring to the perception originating in the head, then all external and internal sounds would be included since all perception occurs in the head. While this definition attempts to restrict the origin of the sound to the head of the owner, it includes both real sounds, which can be detected by an external observer (somatosounds), and hallucinations related to schizophrenia, in addition to tinnitus. The sound perception generated by cochlear implants would also need to be included.

Other definitions were equally broad and not very precise. For example, the definition proposed during the CIBA symposium on tinnitus in 1981 stated, "The sensation of sound not brought about by simultaneously applied mechano-acoustic or electrical signals" (anon., 1981a) and, therefore, includes somatosounds generated anywhere in the whole body.