SOUND ASLEEP
NEWSLETTER
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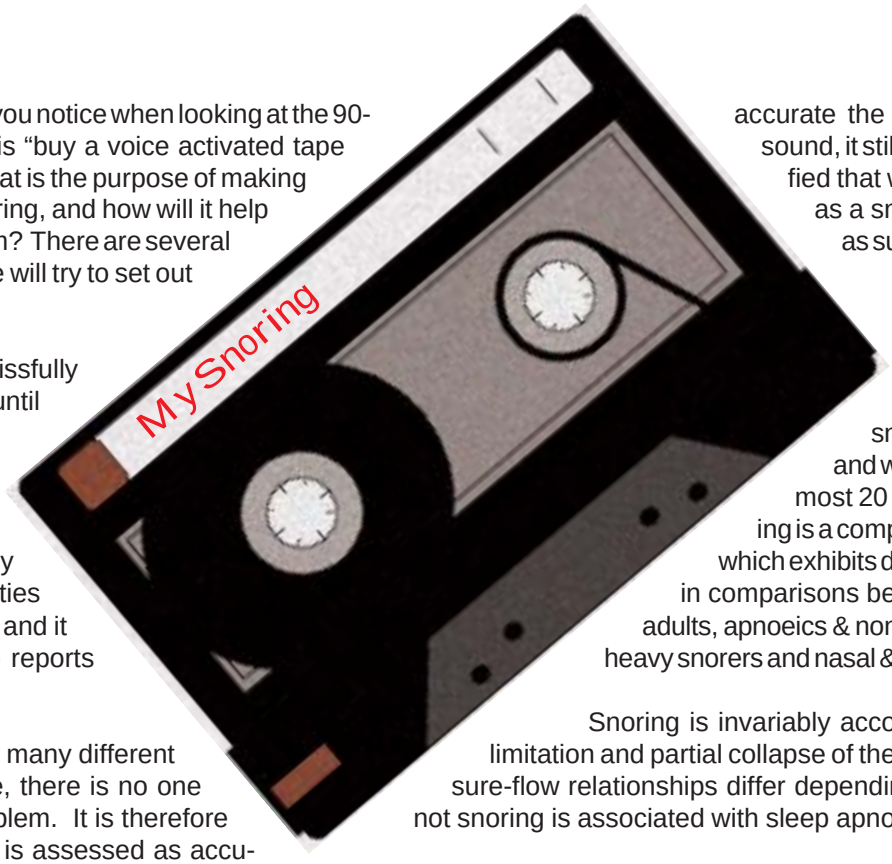
Newsletter from The British Snoring & Sleep Apnoea Association

WHAT ARE THE BENEFITS OF TAPE-RECORDING MY SNORING?

Editorial

One of the first things you notice when looking at the 90-day, Snore-No-More plan is "buy a voice activated tape recorder & C90 tapes". What is the purpose of making a tape recording of my snoring, and how will it help me to overcome my problem? There are several very goods reasons and we will try to set out some of the benefits.



Some snorers are blissfully unaware of their snoring, until their bed partner tells them. Others find that their snoring disturbs both their own and their partner's sleep. Just how badly the snoring affects both parties is a very subjective matter, and it is usually the partner who reports the severity.

Because there are so many different reasons why people snore, there is no one method of treating the problem. It is therefore essential that the problem is assessed as accurately as possible so that a suitable method of treatment can be utilized.

One purpose of recording the snores is to identify the components that are causing the annoyance, and the taped sound can be evaluated accordingly. Hoffstein et al. (1996) studied sound intensity of snoring quite extensively and concluded that snoring noise is highly dependent on the perception of the listener. No matter how precise and accurate the measurement of sound, it still needs to be verified that what is measured as a snore, is perceived as such by the listener.

Sound measurements during sleep to identify snoring are not new, and were performed almost 20 years ago. Snoring is a complex phenomenon which exhibits distinct differences in comparisons between children & adults, apnoeics & non-apnoeics, light & heavy snorers and nasal & mouth breathers.

Snoring is invariably accompanied by flow limitation and partial collapse of the throat, and pressure-flow relationships differ depending on whether or not snoring is associated with sleep apnoea.

A snoring noise can be defined as a noise level in excess of 40 decibels.

The sound of snoring depends on the route of breathing. Snores generated during nasal breathing resemble 'pure' sounds, whereas snores generated during oronasal breathing have a diffuse background of noise. Snoring can occur during inspiration and expiration, and the noise level may change drastically within a single breath. It is

appropriate to assume that a normal airway would not generate noise levels in excess of 40 decibels. Therefore, snoring is said to exist when the characteristic noise is greater than 40 decibels on inspiration, or 50 decibels on expiration.

Sleeping position

It is thought that the snoring sound frequency measured in Hz, differs according to sleep position and whether the snoring originates in the soft palate or at the base of the tongue. Additionally, loudness may also be relative to posture. Smithson et al. (1995) suggested that 'the bed partner is most disturbed by the loudest peaks of sound level which appeared to occur more in the supine position'.

It is not surprising that because snoring sounds are so transient, listeners' perceptions of the sounds differ greatly. What is a loud snore for one bed partner may not be so much of a nuisance to another.

Another valuable item of information that can be obtained from a tape recording is the temporal frequency of snoring, i.e., how often it happens. From a recording it is possible to discover whether the snoring is of a continuous nature or whether it is intermittent. If the sounds are intermittent then it may be possible to determine if these sounds are caused by apnoeic episodes and whether further investigations are necessary.

LAUP before and after

Walker et al. (1996) investigated the effect on snoring sounds before and after LAUP (Laser Assisted Uvulo Palatoplasty). Their study comprised both subjective and objective data. They objectively measured sound frequency, pattern and volume, and were keen to discover what part of the snoring noise was the most annoying to the human ear. The subjective data was collected by an independent interviewer. A sophisticated DAT tape machine was used to obtain pre- and post-operative recordings for analysis. It was found that LAUP alters the snoring sound with loudness being reduced in maximum and average values. All measured criteria were reduced significantly, with the greatest improvement being in the low frequency snores. Subjectively the improvements were comparable with the objective data, and it is suggested that the low frequency sounds are the most intrusive and disturbing.

LAUP was found to significantly alter the snoring noise in a favourable manner by both objective and subjective standards.

Other researchers (Quinn et al. 1996) studied snorers by using both sound analysis and a nasendoscopic examination during or immediately after the cessation of the sound recording. These researchers found that by analysing the frequency level of the snoring noise they were able to ascertain whether the snoring was tongue based, palatal based or both.

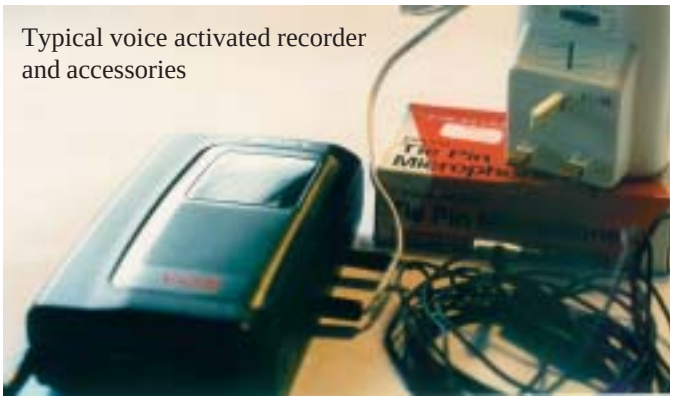
They also found that the sound waveform for palatal snoring was characterised by a series of impulses. The waveform pattern of tongue base snoring was made up of higher frequency oscillations of an apparently chaotic nature, compared to those of the palatal snorers. Palatal snoring is characterised by rapid repetitive cycles of opening and closing of the nasopharyngeal airway. Tongue base snoring appears to be associated with airflow turbulence in a rapid, continuous airflow through a severely narrowed airway. Turbulence-induced sound has a higher frequency and broader spectral range than that produced by the floppy soft palate intermittently obstructing the nasopharyngeal airway. Some snorers of course can produce both palatal and tongue base snoring.

So how can all this help me to stop snoring?

Well quite simply, by recognising what kind of snorer you are, you are in a better position to decide how to combat this problem. The difference between tongue base snoring and palatal snoring is audible and it is very likely that a tutored ear could differentiate between these two types of snoring. If you are contemplating palatal surgery for snoring, then recording your snoring sounds may spare you a painful operation which has little or no hope of improving your condition if your snoring is tongue based.

How do I setup my recording equipment?

Most High Street electrical stores such as Dixons and Currys have portable Walkman-style voice activated cassette tape recorders. The tape starts to run as soon as a noise is detected which is louder that the recorder's sensitivity setting. Once the noise stops, so too does the recorder. Some recorders have a counter which increases in relation to the recording time. If you buy one of this type you will be able to calibrate it to measure how long in total you have been snoring that night. For example, if the counter went from 0 to 180 when a C90 (90 minute) tape was played all through, a reading of 60 would equate to 30 minutes of snoring.



Typical voice activated recorder and accessories

If you want to know more precisely at what part of the night your snoring occurs, you can invest in a talking clock with an hour report. These clocks use a voice synthesizer to "speak" the time on the hour each hour. If placed near the microphone, the clock will start the tape. When you review the recording you will be able to assess the duration of snoring in hourly intervals.

From a practical point of view, we recommend that you equip yourself with an external microphone (a tie pin type is very useful). This should be positioned immediately above you on the headboard of the bed so it picks up snores whether you are lying on your back or on either side. To ensure consistency from night to night, it is wise to note the precise position and orientation of the microphone. Additionally, a power supply is a good idea so you don't have to rely on batteries which could run out in the middle of an important recording.

Once you have your recording, you can do a layman's assessment yourself, although your consultant's trained ear is likely to be more accurate. Listen for the "pure" sound of the tongue based snore or for the "white noise" with low frequencies and a narrow sound range typical of the palate based snore. As you probably already appreciate, the treatment methods for the two types of snoring can be different.

If you get a good recording of your snoring, and you can measure the total snoring time (provided it does not exceed 90 minutes!), you will be in a position to evaluate your chosen treatment. You will be able to establish what will probably work for you and what won't.

What do I do now?

Now that you have a better idea of what kind of snorer you are you can go back to your 90-day Snore-No-More plan and follow the appropriate steps. Meanwhile, don't dispense with your tape recording as it may come in handy some time in the future. If after the 90 days you have been unable to find a suitable remedy for your snoring, it might be appropriate for you to think about asking your GP for a sleep study to ascertain if there is any indication of sleep apnoea. Your tape will be invaluable now as the technicians in the sleep unit may be able to analyse your recording to help the consultant give you a more accurate diagnosis.