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A WORLD LEADER
IN SUPPORT AND ADVICE

Information for musicians: reducing the risk of tinnitus

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This information has been written to help you understand more about the effect of loud music on your hearing, and how you can protect yourself, reducing the risk of hearing damage and tinnitus.

Foreword

by Eddy Temple-Morris, BTA Ambassador, DJ, Producer and Presenter

Music and tinnitus have been unhappy bedfellows ever since the first time music was amplified, and the number of people suffering will increase and keep on increasing, whilst our ears get battered more and more by mp3 players, mobile phones, and speakers in our daily lives.

Never has there been a need for more research, so we can better understand the condition and therefore get closer to finding a cure. We will continue to work on some amazing ideas to raise awareness and funds for the BTA as we consider that continually communicating, and offering useful information, is vital if we are to improve understanding and help those with tinnitus to live with the condition, if it can't be made better.

There are some useful links at the end of the leaflet, and it's worth adding that I can personally vouch for the advice given regarding musician's earplugs. My tinnitus has improved since I started wearing them, so I'd recommend them to anyone who's exposed to loud music as a way of life.

With very best wishes,

Eddy

Introduction

Because of loud sound levels and frequent exposure to noise, musicians can develop hearing problems such as tinnitus and hearing loss. The advice which is given is sometimes along the following lines: "Give up your career or interest and find something quieter to do" or "Just keep playing and don't let the tinnitus affect your life", neither of which are particularly helpful.

However, it is usually possible to strike a balance between these two views. You can continue with your music by using the right kind of hearing protection, which reduces the sound levels to which you are exposed without unduly affecting your listening sound quality. Many musicians have taken this option, and it seems to be a sensible, practical way of dealing with the

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problem.

Musicians should protect their hearing whilst playing. There are various reasons for this – for example, the risk of hearing damage, post-exposure tinnitus and loudness discomfort.

Noise legislation

If you are an employed musician, the *Control of Noise at Work Regulations (2005)*, which implemented the *EU Physical Agents Directive (Noise)* in the UK, made employers responsible for the assessment, management and reduction of noise in the workplace, including the provision, where appropriate, of suitable hearing protection. The music and entertainment industry was allowed a three-year period before the Regulations became effective in 2008.

So any employed musician should now have access to advice, suitable hearing protection and/or other forms of noise reduction. But self-employed and amateur musicians also need help and advice!

Risk to hearing and noise reduction

The risk to hearing from noise at work is dependent on the sound intensity (acoustic power). The safe exposure limit is calculated from a combination of exposure time and sound intensity. Reducing the noise level by only three decibels would allow a doubling of the exposure time, but this is not feasible for performances as controlling playing time is not really a very effective way of managing a musician's noise exposure.

Most international regulations for exposure at work state that the loudest noise someone should be exposed to for an eight hour working day is 85 decibels (dB) - see Table 1

Our leaflet *Noise and the ear* discusses noise dosage, identifying loud noise and the consequences of noise exposure in more detail - please contact us for a copy or visit our website www.tinnitus.org.uk

Reducing the level of sound reaching the musician's ear, whilst still providing a realistic listening environment, is the best way forward for most people. A suitably chosen and correctly fitted **flat attenuation** earplug can be

Table 1 - a table of maximum exposure time for a range of noise intensities.

Noise intensity (dB)	Maximum unprotected exposure*	Typical example
85	8 hours	blender, milling machine
88	4 hours	forklift truck
91	2 hours	Tube train passing
94	1 hour	lawnmower
97	30 minutes	industrial fire alarm
100	15 minutes	bulldozer, handheld drill
103	7½ minutes	CD player at full volume
106	3¾ minutes	motorbike
109	112 seconds	crying baby, jackhammer
112	66 seconds	full symphony orchestra
115	33 seconds	emergency vehicle siren

* before damage may occur

an effective solution, maintaining musical fidelity. In some cases, screens and sound absorbing surfaces can also play a part in managing noise exposure.

Some people will develop permanent **noise-induced hearing loss** (NIHL) at moderate noise levels whilst others will not. Susceptibility to NIHL is predictable, so it is not possible to say whether an individual is at risk just by taking a hearing test. Saying "I have tough ears" is not a sensible approach to protecting your long-term hearing! And if you have NIHL, don't say, "It's too late for me", it's all the more important to protect your ears from even more damage and to try to avoid the onset of tinnitus.

Musicians' hearing protectors

A wide range of technical ear protection products are available. Effective earplugs will reduce the overall level of sound whilst maintaining an even balance across the sound spectrum. This means that you can still hear everything clearly, although the overall sound level is reduced. The greater the number of decibels (dBs) of attenuation by the ear plugs, the better overall protection they offer.

Whilst there are a number of generic earplugs available

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Table 2 A comparison of some sounds (based on S.Everton 2006)

		dB	
		160	
		150	INTOLERABLE
		140	140dB Peak Exposure Limit Value
Live rock band		130	PAIN
High hat symbol strike		120	
Full symphony orchestra		110	
Bar in nightclub	<i>fff</i>	100	VERY NOISY
Chamber music in small auditorium	<i>ff</i>	90	LOUD
Loud radio	<i>f</i>	80	85dB Upper Exposure Action Value
Normal piano practice	<i>mf</i>	80	80dB Lower Exposure Action Value
		70	
Soft radio in home	<i>p</i>	60	MODERATE
Background TV studio	<i>pp</i>	50	QUIET
Quiet office		40	
		30	FAINT
		20	
Rustle of leaves	<i>ppp</i>	10	VERY FAINT
		0	

Threshold of hearing

are aimed at musicians (and stocked by the BTA), customised earplugs may provide a higher level of protection as well as better fidelity of sound. They tend to be more expensive but should be looked upon as an investment.

A number of companies manufacture specialist hearing protectors and in-the-ear monitors for musicians. Essentially, musicians' earplugs are either based upon an earplug incorporating a "tuned" mechanical filter set to provide a flat frequency response and some reduction in intensity, or a fusion of hearing protection and digital hearing aid technology. In the latter devices, the sound level at the ear may be controlled by a level-dependent amplifier and the frequency response of the system can be tailored to suit the wearer's audiogram. These earplugs may also be used by anyone who wishes to reduce the sound levels to which they are exposed without having muffled or distorted hearing.

A decent amplifier or instrument can cost a considerable amount, so spending a smaller sum protecting your hearing, without impeding your playing too much, seems a reasonable outlay.

If you wish to find out more about musicians' earplugs

the best option is to discuss your requirements with a qualified audiologist.

Other sources of noise

As the impact of noise or loud levels of sound on the ear is accumulative, do not forget that there are a variety of other sources of noise or loud sounds that may need to be taken into account when considering the level of noise to which you are exposed. Those who use firearms, motor cycles, power tools or other devices that produce loud levels of sound should protect their ears when doing so. These different types of sound exposure all require different types of protection. For example, musicians' earplugs are not suitable for someone who wishes to use a shotgun. Again, if you have any doubts, please consult an audiologist.

Further resources

A good source of information for musicians is the US charity HEAR (Hearing Education and Awareness for Rockers). Their advice is helpful for all musicians, not only rockers: www.hear.net

More information and a comprehensive guide are available from the Health and Safety Executive (HSE) website: www.hse.gov.uk/noise/musicound.htm

The HSE also have a number of leaflets and more comprehensive guides to download:

- Mythbuster: Noise in music and entertainment sectors www.hse.gov.uk/noise/mythaug07.pdf
- Sound advice: Control of noise at work in music and entertainment www.hse.gov.uk/pubns/books/hsg260.htm
- The Sound Advice website from the HSE is well presented with many practical tips for musicians of all kinds, and for venues too: www.soundadvice.info/

References

A list of the references consulted in preparing this leaflet is available on request.

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Alternative formats

This publication is available in large print on request.

For further information

Our helpline staff can answer your questions on this and other tinnitus related topics on 0800 018 0527.

BTA publications

Our information leaflets are written by leading tinnitus professionals and provide accurate, reliable and authoritative information which is updated regularly.

Please contact us if you would like to receive a copy of any of our information leaflets listed below, or they can be downloaded from our website.

- All about tinnitus
- Balance and tinnitus
- Complementary therapies for tinnitus: an opinion
- Drugs and tinnitus
- Ear wax removal and tinnitus
- Flying and the ear
- Food, drink and tinnitus
- Hearing aids and tinnitus
- Hyperacusis
- Information for musicians
- Musical hallucination (musical tinnitus)
- Noise and the ear
- Otosclerosis

- Pulsatile tinnitus
- Relaxation
- Self help for tinnitus
- Sound therapy
- Sources of mutual support for tinnitus
- Supporting someone with tinnitus
- Taming tinnitus
- Tinnitus and disorders of the temporomandibular joint (TMJ) and neck
- Tinnitus and sleep disturbance
- Tinnitus and stress
- Tinnitus services

Leaflets for children:

- Ellie, Leila and Jack have tinnitus (for under 8s)
- Tinnitus (for 8-11 year olds)
- Tinnitus (for 11-16 year olds)

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British Tinnitus Association

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Email: info@tinnitus.org.uk

Helpline: **0800 018 0527**

www.tinnitus.org.uk

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