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 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!

Whilst the BTA makes every attempt to ensure the accuracy and reliability of this information, it is not a substitute for medical advice. You should always see your GP/medical professional.
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.

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

<table>
<thead>
<tr>
<th>Noise intensity (dB)</th>
<th>Maximum unprotected exposure*</th>
<th>Typical example</th>
</tr>
</thead>
<tbody>
<tr>
<td>85</td>
<td>8 hours</td>
<td>blender, milling machine</td>
</tr>
<tr>
<td>88</td>
<td>4 hours</td>
<td>forklift truck</td>
</tr>
<tr>
<td>91</td>
<td>2 hours</td>
<td>Tube train passing</td>
</tr>
<tr>
<td>94</td>
<td>1 hour</td>
<td>lawnmower</td>
</tr>
<tr>
<td>97</td>
<td>30 minutes</td>
<td>industrial fire alarm</td>
</tr>
<tr>
<td>100</td>
<td>15 minutes</td>
<td>bulldozer, handheld drill</td>
</tr>
<tr>
<td>103</td>
<td>7½ minutes</td>
<td>CD player at full volume</td>
</tr>
<tr>
<td>106</td>
<td>3½ minutes</td>
<td>motorbike</td>
</tr>
<tr>
<td>109</td>
<td>112 seconds</td>
<td>crying baby, jackhammer</td>
</tr>
<tr>
<td>112</td>
<td>66 seconds</td>
<td>full symphony orchestra</td>
</tr>
<tr>
<td>115</td>
<td>33 seconds</td>
<td>emergency vehicle siren</td>
</tr>
</tbody>
</table>

* before damage may occur

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 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 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 ear plugs may also be used by anyone who wishes to reduce the sound levels to which they are exposed without having muffled or distorted hearing.

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

<table>
<thead>
<tr>
<th>dB</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>160</td>
<td>INTOLERABLE</td>
</tr>
<tr>
<td>150</td>
<td>140dB Peak Exposure Limit Value</td>
</tr>
<tr>
<td>140</td>
<td>PAIN</td>
</tr>
<tr>
<td>130</td>
<td></td>
</tr>
<tr>
<td>120</td>
<td></td>
</tr>
<tr>
<td>110</td>
<td></td>
</tr>
<tr>
<td>100</td>
<td>85dB Upper Exposure Action Value</td>
</tr>
<tr>
<td>90</td>
<td>LOUD</td>
</tr>
<tr>
<td>80</td>
<td>80dB Lower Exposure Action Value</td>
</tr>
<tr>
<td>70</td>
<td>VERY NOISY</td>
</tr>
<tr>
<td>60</td>
<td>MODERATE</td>
</tr>
<tr>
<td>50</td>
<td>QUIET</td>
</tr>
<tr>
<td>40</td>
<td></td>
</tr>
<tr>
<td>30</td>
<td>FAINT</td>
</tr>
<tr>
<td>20</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>VERY FAINT</td>
</tr>
<tr>
<td>0</td>
<td>Threshold of hearing</td>
</tr>
</tbody>
</table>

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**

The BTA’s Plug’em campaign has a website with further information about noise and hearing protection: www.plugem.co.uk

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.hearnet.com

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

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


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/

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References

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

Alternative formats

This publication is available in large print on request.

For further information

Our helpline staff can answer your questions on any tinnitus related topics on 0800 018 0527. You may also find our website takeontinnitus.co.uk helpful.

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.

*available in Easy Read

All about tinnitus*

Complementary therapy 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

Ideas for relaxation without sound

Information for musicians

Mindfulness for tinnitus

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 temporo-mandibular joint (TMJ) and neck

Tinnitus: a parent’s guide

Tinnitus: a teacher’s guide

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)

Ellie, Leila and Jack have tinnitus activity book

Tinnitus activity book (for 8-11 year olds)

Tinnitus activity book (for 11-16 year olds)

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Website: tinnitus.org.uk

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