

# Noise Exposure of Music Teachers: Teaching Strategies to Reduce Noise Exposure

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## About this document

- **This is a 2023 pdf version of an older web page**, part of a series.
- Neither content nor links have been updated. Links may not work.
- Please visit [malcolmtattersall.com.au/music/noise-exposure-of-music-teachers/](http://malcolmtattersall.com.au/music/noise-exposure-of-music-teachers/) for an introduction to the whole series.

## Associated documents

- *Noise Exposure of Music Teachers: Introduction*
- *Defining the Problem*
- *Teaching Strategies to reduce noise exposure*
- *Approximating Noise Exposure in small-group woodwind teaching*
- *Hearing Loss, Noise Exposure and the Law*
- *Hearing Protection for music teachers*
- *Links*

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## Introduction

In case you have not come here from there, the introductory page sets out the scope of this site. *Defining the Problem* then introduces basic concepts of sound levels and noise exposure and develops a rough estimate of the levels music teachers are likely to be exposed to in their work. Those levels are high enough to raise concerns about hearing loss. So what should we do to reduce them?

## Teaching strategies

### 1. *Stand back.*

Sound intensity diminishes quite quickly with distance. If your ears are twice as far from the source, they will receive about one quarter as much direct sound. Reflected sound reduces the benefit but further away is still better than close up.

### 2. *Arrange your teaching set-up with the instruments' sound-projection patterns in mind.*

Each instrument has a typical pattern of sound radiation, some more directional than others. For instance, most of the sound from a brass instrument comes straight out of the bell, so putting yourself at the centre of a semicircle of trumpet players is a very poor career choice. Standing at one end of the semicircle will be easier on your ears, and will still allow good communication. It's even better if the students are sitting, so that you are above the sound as well as out of its direct horizontal line. Woodwinds are less directional, but the same strategy applies.<sup>1</sup>

### 3. *Choose or modify, if you can, your working space to reduce reflected sound and/or your*

*exposure to it.*

Sound waves are like any other waves: if they don't hit anything, they travel onwards and outwards, but if they hit an obstacle they are reflected and/or absorbed by it. Hard surfaces reflect sound, soft surfaces absorb it, smooth surfaces reflect it all in one direction and rough surfaces scatter it in all directions.

If you stand with your back to a smooth hard surface (e.g. a whiteboard), sound headed in your general direction will bounce back at you (and the students in front of you) from that surface. If you stand with your back to an open window, sound will just keep on going. If you stand with your back to a carpeted wall, some of the sound will be reflected at you and some will be absorbed. Fairly simple acoustic treatment of a room (acoustic tiles, carpet, curtains) can reduce noise levels by as much as 3dB.<sup>2</sup> Room size makes a difference, too: doubling the volume of the room can reduce exposure by 2 dB.<sup>3</sup>

This kind of change can be beneficial to the teaching as well: too much reflected sound is irritating and tiring for teacher/conductor and players alike.

#### *4. Play less yourself. The instrument closest to your ears is your own!*

Playing along with students has many benefits: modelling tone, intonation, articulation, and posture; role-modelling; and leading an ensemble or section. However, too much playing can have creeping negative effects on teaching outcomes. The teacher's attention is divided between his own playing and the students; the students' sound can be masked by the teacher's sound, leading to unrealistic faith (on the part of teacher and/or students) in the students' sound quality; and the teacher's leadership can mask students' lack of rhythmic security and independence.

Look at your teaching habits. You may decide that less playing with your students is better for their learning as well as for your ears.

#### *5. Take fewer students at a time.*

This is often not an option, since schools usually dictate numbers per lesson according to their budget and/or the fee levels paid by the students, but is effective: halving the number of students in a lesson will reduce exposure by about 2 dB.

Eaton<sup>4</sup> makes the point that reducing the number of brass players, the loudest players, in a concert band is particularly effective. Again, that is not always an option but it might be an extra reason for the conductor to try to maintain musically optimum balance: your keen young trombonist might have to wait until there is a genuine vacancy in the band before he joins, but that won't do him any harm in the long run.

#### *6. Get the students to play fewer wrong notes and fewer unnecessary notes.*

Approaches like these, used appropriately, can improve learning as well as reduce our noise exposure:

- a. More individual and sectional playing, less whole-group playing.
- b. More rhythm-clapping, note-name singing, etc, when the point at issue is rhythm, note reading, etc.
- c. More verbal discussion of notational and technical issues.

For instance, having the whole group just play through a piece repeatedly because some players have the rhythm wrong will not necessarily fix the problem quickest; and because the wrong

players correct their mistakes only by imitation, the experience will not help them read rhythm more accurately next time - they will have memorised 'how the piece goes', not learnt rhythmic relationships between different note values. Again, having the whole band play a passage again in the hope that your saxophone players will magically remember to play that G# tends to be less efficient than stopping and pointing it out to them.

Certainly, our students have to play to learn, and we want them to play for pleasure. However, encouraging repetition of errors is very poor teaching technique. What is best for them is to play as many *right* notes as possible; minimising the *wrong* notes is good for their learning as well as our hearing.

A combination of these strategies could reduce our average daily exposure by 6 dB or more with no negative effects (and perhaps even some positive effects) on teaching outcomes, depending on our current teaching style and circumstances. If, as I believe, our typical annual exposure hovers around the acceptable (and legal) limit of 85 dB, that kind of reduction is enough to bring us back into a much safer zone.

## What else should I do?

If you think your total exposure may be over the safe limit, talk to the Workplace Health and Safety officer at your school/s to see what changes are possible. Don't be surprised if you encounter initial incomprehension from WHS officers - it's unlikely that they have ever had to consider music-related noise exposure before (perhaps they should have, when one of those dreadfully loud school discos was planned, but that is another story). I'm sorry to have to say it, but you shouldn't be surprised if your employer also displays incomprehension or if that is followed by hostility. It is his responsibility (see *Defining the Problem*) but it is likely to be a nuisance to him and may be an expense to the school.

Get your hearing tested - immediately. Hearing assessments are cheap. If your hearing is good, that's great and you have a reference to base any later tests against. If not, you will know how urgent it might be to take action to reduce excessive exposure. See *Early Signs of Hearing Loss* for more on this.

Consider using musician's earplugs. They can be problematical in the teaching situation but may be valuable elsewhere. See *Hearing Protection for Music Teachers* for more.

## Notes

See *Links* page for details of all references. Click [here](#) to open it in a new window.

**1** Flute sound projects mainly forward and to the player's right, clarinet and oboe straight ahead. See Meyer for similar information on strings and brass and for more on woodwind.

**2** Eaton, *Determining ...*

**3** Eaton, *op. cit.*

**4** Eaton, *op. cit.*