Welcome

Welcome to this week’s edition of BC Disease News.

In the last week, an interim report from Lord Justice Briggs has been published coinciding with a programme for reform of the courts by Her Majesty’s Courts and Tribunals Service (HMCTS) and looking at civil court structures and judicial processes more generally. Elsewhere, Ikea has been ordered to pay £3,500 to a grandmother after failing to convince the court she was fundamentally dishonest.

This week we present the first of a two part feature discussing the new CLB Guidelines and the proposed method therein for the quantification of NIHL, with worked examples. The second part of the feature will be an analysis of over 10,000 audiograms to see how the new guidelines would affect NIHL disability assessment, quantum and, if used for diagnosis, the percentage of claims which would satisfy a finding of NIHL.

Any comments or feedback can be sent to Boris Cetnik or Charlotte Owen.

As always, warmest regards to all.

SUBJECTS

Prediction of Future Mesothelioma Rates In Those Born Since 1965

A new study published in Occupational and Environmental Medicine has the objective of developing a model to allow future mesothelioma rates to be predicted, particularly in those born since 1965, whose working lives would mostly have commenced after widespread installation of asbestos ceased in the UK. ¹

In order to make predictions of the likelihood that a member of a particular occupational group will develop mesothelioma due to asbestos exposure, the individual’s amount of exposure must be known, and must be compared to a historical group with known exposures. However, estimation of the lifetime exposure for those working in occupations such as shipbuilding and construction prior to the 1980s, when asbestos was widely used, is not possible. In addition to being dependent on the participants’ memories, a number of contributory factors would be unknown for each of the many exposure situations (for example, type of asbestos, weight percentage in of asbestos in materials, amount of ventilation). The present study used a measure of asbestos exposure that is directly measureable.

The researchers used transmission electron microscopy (TEM) to determine the number of asbestos fibres in lung tissue samples from 133 mesothelioma patients and 262 lung cancer patients. This is known as the asbestos lung burden, and is the only indicator of lifetime asbestos exposure that can be measured reliably. Lung cancer patients were used as controls, because they are a group from which lung tissue samples are available. Only a small proportion of lung cancers are caused by asbestos, so the asbestos exposures of the lung cancer patients are representative of the general population, except at very high exposure. All participants were interviewed about their occupational history, along with 1420 population controls. The participants were born around 1945, so asbestos would have been widely used throughout their working lives, and those in jobs with the potential for exposure may have been exposed for 20 years. The researchers found that the mean lung burden increases with increasing expected exposure based on occupation.

A linear dose-response model was used, and mesothelioma death rates were found to be proportional to mean lung burden. The model implied a lifetime risk of mesothelioma of 0.020 % per 1000 asbestos fibres per gram of lung tissue. The effects of using lung cancer patients as controls were accounted for by the model - lung cancers due to asbestos were found in patients with the highest 1 % of lung burdens. The majority of the counted asbestos fibres were amosite (75 %) or crocidolite (18 %), despite these only comprising 9 % and 2 % of asbestos imported to the UK since 1954 respectively (the majority of imported asbestos was chrysotile, but these fibres disappear from the lungs over a number of months, so few remained in the study participants). The model suggests that the mesothelioma risk per fibre is approximately 1.3 times higher for crocidolite than for amosite.

Statistical analysis of the cases and the controls suggested that 14 % of male and 62 % of female mesotheliomas were not attributable to occupational or domestic asbestos exposure. It was also predicted that 25 % of mesotheliomas in patients with occupations classed as low-risk may be due to work-related exposures such as occasionally handling sealed asbestos waste, use of asbestos ironing boards and office work in companies that handle building materials. However, the sample size for this prediction was small, as there were only 12 mesothelioma cases in the low-risk occupational group, 3 of which may be work-related.

The primary findings from the study are the major contribution of amosite to mesothelioma incidence in the UK and the substantial contribution of non-occupational asbestos exposure, particularly in women. It is also reported that, “Our results confirm that most mesotheliomas are caused by asbestos even in those who never worked in asbestos-related occupations”. The notion that mesothelioma is most likely caused by asbestos but that exposure may not be occupational may help to defend claims.

The risks of mesothelioma in those born since 1965 are not yet well known; due to the long period of time between exposure and disease onset, such cases are yet to be reported. In principle, the rates in this age group, whose working lives would have commenced since widespread use of crocidolite and amosite ended in 1970 and 1980 respectively, should be lower than in those born earlier. However, asbestos is still present in many buildings and the risks to this age group are not known, but could, according to the report, be substantial. The model developed in this study may allow mesothelioma rates to be predicted for this age group. When samples of lung tissue become available, for example, in lung cancer patients, the asbestos lung burden may be measured and compared with the linear model to estimate the chance of mesothelioma development in the patient’s occupational group.

Though this study appears to achieve its goal of developing a model to allow future mesothelioma rates to be predicted, there is still some way to go before numbers of future mesothelioma cases may be estimated even approximately. The modelling did not take into account the elimination of crocidolite and amosite from the lungs, because all of the participants were of similar age and had been exposed to asbestos during broadly the same period of time. The half-life (time taken for half of the fibres to be eliminated) of crocidolite has been estimated as 6-10 years, and the half-life of amosite has been estimated as 20 years. In other words, only 50 % of the original amount of fibres will remain in the lungs of a patient whose exposure to amosite ended 20 years ago. Thus, the model formulated in this study is suitable for patients with exposure history similar to the participants of this study, those whose exposure ended at least 20 years prior to lung samples being taken. Indeed, other studies of lung burden and mesothelioma risk reported higher lung burdens in participants, which may be due to more recent exposure. This means that when a future patient’s lung burden is found to correspond with a calculated lifetime risk of mesothelioma using the model in the present study, the risk may be overestimated, because if the patient has been exposed within the last 20 years, their lung burden will be higher than that of a
similarly-exposed participant in this study whose exposure ended 20 years ago.

Though this is the first study to obtain occupational histories by interview and measure asbestos lung burden by TEM in a large population-based group of mesothelioma patients, it is not the first to attempt to predict future mesothelioma rates in Britain. A study published in 2010 predicted that mortality among males will peak in 2016 with 2040 deaths, and decline rapidly thereafter. Though the 2010 study did not measure exposure from lung samples, and used data based on deaths of males ages 20-89 years between 1968 and 2006, the model included an allowance for ‘background’ cases, or mesothelioma cases that would have occurred in an entirely unexposed population, which the current study did not. The 2010 study improved upon a model that was first published in 2005, which is based on a model developed by the Health Effects Institute in 1991. The current study predicts a slightly higher lifetime risk of mesothelioma due to asbestos, 0.86%, than the 2010 study, which predicted 0.72%. The authors of the new study note that if the 2010 study lifetime risk prediction is more accurate, the mesothelioma risk per 1000 fibres per gram of lung tissue should be reduced from 0.020% to 0.017%.

To summarise, this recent study proposes a linear relationship between the amount of amosite and crocidolite fibres in lung tissue and the likelihood of mesothelioma development. This might allow estimations to be made of the likelihood of mesothelioma incidence in groups of people whose working lives span the period since asbestos ceased to be installed. However, consideration should also be given to earlier, similar studies if quantitative estimates of mesothelioma rates are to be attempted.

**First Case to Report Failure of Fundamental Dishonesty Defence**

Ikea has been ordered to pay £3,500 to the grandmother after failing to convince the court she was a fraud.³

The defendant had tried to invoke the defence of fundamental dishonesty following an incident in its Warrington store last year, where Carol Ravenscroft suffered arm injuries while stopping a wardrobe from falling on her two-year-old grandson.

The defence has been available to parties since early 2015 and allows for dismissal of a claim if the claimant has been fundamentally dishonest. Defendants have used the strategy in their favour since April but this is one of the first reported cases of the fundamental dishonesty defence failing. Ravenscroft, contested Ikea’s attempt to have the case struck out and secured damages during a hearing at Manchester County Court last week. The legal representative for Ravenscroft said his client was ‘horrified’ at ‘groundless accusations’ that she had exaggerated the nature the incident and her injuries. He went on to claim that ‘We believe Ikea were trying to use these tactics to put her off in the hope she would drop her claim’.

Ikea accepted the ruling of the Manchester County Court on this matter.

**Case Comment:**

**Ghising v Secretary of State for the Home Department**

A law firm was justified in charging a retrospective success fee as the claimant did not face different risks when he signed a conditional fee agreement (CFA) as when he had applied for legal aid five months earlier, the High Court has ruled. Mrs Justice Patterson in **Ghising v Secretary of State for the Home Department** [2015] EWHC 3706 (QB), overturned the ruling of Master Simons, who had found that there had been a change in risk in that period. The court heard that Roshan Ghising was a dependant adult child of a veteran of the Gurkha Brigade who had settled in the UK. Mr Ghising was denied entry clearance but he was successful at the Court of Appeal in his part of a test case on the lawfulness of this decision brought against the Home Office in 2012.⁴

Patterson J said the case was remitted to the Upper Tribunal, where the home secretary was ordered to pay costs in 2013. However, the parties failed to agree on quantum and the matter came before Master Simons in May 2015.

Howe & Co applied to the Legal Services Commission in July 2012 for legal aid to cover his appeal but the application was initially refused. A resubmission was made, but no decision was forthcoming from the Commission by the end of November.

With the hearing imminent, in December, Mr Ghising entered into a CFA with Howe & Co, which covered ‘all the work undertaken’ by the solicitor involved, Christopher Jacobs, including all ‘interlocutory matters’ from August. The law firm argued that when it applied for legal aid, it ticked a box indicating the chance of success at between 60% and 80%, and when Mr Jacobs took over the case in late summer, he estimated the chances of success at 65% and the CFA put the success fee at 100%.

Master Simons ruled: ‘It is not for this court to make its own assessment of the risks in July and December, especially in a case such as this where it seems to me that the risks were so different, and this supports the view that the proper time to assess the risk is at the time of the entering into the CFA when one cannot use the benefit of hindsight and my judgment is that, in this particular case, these success fees should not be retrospective’.

Relying on Lord Neuberger’s ruling in **Motto v Trafalga**, Patterson J said the issue was ‘whether the costs judge went wrong on a point of law or principle, reached a conclusion which was plainly wrong, or took into account irrelevant evidence or misunderstood relevant evidence’. Sitting with Master O’Hare as assessor, Patterson J said that although parts of Master Simons’ ruling were not ‘as pellucid as they might be’, he had correctly approached the issue of risk assessment.
He stated further: ‘He said clearly that it was a fundamental aspect of a success fee claimed in the CFA that it was to be assessed at the time that the CFA was entered into without the benefit of hindsight. So far so good’.

However, Patterson J said she did not ‘understand what evidential basis the master had for saying that there was a different risk in July 2012 to that which there was in December 2012’. She noted that the 65% estimated in December was ‘self-evidently within the bracket of success originally estimated by Howe & Co’.

She added that the wording of the CFA was not ambiguous and was ‘clearly capable of covering a retrospective position’. Patterson J allowed the appeal and said the parties had agreed that a further detailed costs assessment could be done on the papers.

Civil Courts Structure Review Interim Report Published

An interim report from Lord Justice Briggs has been published this week following formal consultation. It was commissioned by the Lord Chief Justice and the Master of the Rolls in July 2015 to coincide with a programme for reform of the courts by Her Majesty’s Courts and Tribunals Service (HMCTS) and looking at civil court structures and judicial processes more generally.

A larger, more formal process of consultation will be completed by the end of May 2016. Written responses are invited not later than the end of February 2016, and Lord Justice Briggs will hold a programme of meetings from March to May. He will complete this review by the end of July 2016.

Some of the main proposals within the report were that:

- There was a clear and pressing need to create an Online Court for claims up to £25,000 designed for the first time to give litigants ‘effective access to justice without having to incur the disproportionate cost of using lawyers’. Three stages were proposed: Stage 1- a largely automated, inter-active online process for the identification of the issues and the provision of documentary evidence; Stage 2 – conciliation and case management, by case officers; Stage 3 resolution by judges. The court will use documents on screen, telephone, video or face to face meetings to meet the needs of each case.
- Transfer some of judges’ more routine and non-contentious work to Case Officers supervised by judges. Parties should have the right to have a Case Officer’s decision reconsidered by a judge.
- There should be a stronger concentration of civil expertise among the Circuit Judges and District Judges.
- All civil work with a regional connection should be tried in the regions, regardless of value, subject to very limited specialist exceptions such as Patents.

The most controversial of these proposals is clearly relating to online dispute resolution (ODR). Briggs LJ acknowledges that the online court would be the first court ever to be designed in England and Wales for use by litigants without lawyers, stating: ‘The online court will mark a radical departure from the traditional courts (outside the small claims track) by being less adversarial, more investigative, and by making the judge his or her own lawyer.’

The Law Society have previously identified the following problems with online dispute resolution which were:

- Online filing of evidence could be problematic for litigants in person that might not have the technological capacity or resources to digitally file a large number of documents.
- There could be important issues of data security and protection raised which will need to be addressed if prospective litigants in person are to have confidence in the system.
- In terms of access to justice, an online dispute system could be considered a ‘double edged sword’, for example, it could improve access for people with mobility problems or who struggle with the costs associated with attending court.

The full report can be found here.

Lord Chief Justice Declares Civil Justice Unaffordable for the Majority

In his annual report to parliament, Lord Thomas of Cwmgiedd welcomed the government’s commitment to spending £780m on modernisation and new technology,5 but went on to say:

‘Our system of justice has become unaffordable to most. In consequence there has been a considerable increase of litigants in person for whom our current court system is not really designed. Although in common with many other European states the number of court buildings has been reduced through closure, the failure to invest has meant that many of the courtrooms have not been modernised and lack modern means of communication to provide for better access to justice’.

Lord Thomas also expressed concern that the steep increases in court fees which judges formally opposed, have had a worrying effect on access to justice. Although, he did suggest that investment in modernising the courts and the development of online justice would improve the system’s ability to respond to the public’s need and the increase in litigants in person.

He also suggested that the government should introduce fixed fees across the fast-track and ‘lower end’ of the multi-track. He stated: ‘The judiciary strongly supports the application of fixed recoverable costs across the range of fast-track cases, and in the lower reaches of the multi-track. This
would help to ensure that litigation costs are reasonable, proportionate and that all parties can proceed with greater certainty. The judiciary hopes that the government will give this proposal favourable consideration’.

Thomas, the head of the judiciary in England and Wales, said that judges, in common with many other people, felt their burden of work had increased. ‘For example, they are having to handle an ever-increasing quantity of challenging and emotionally charged cases in family and crime, as well as an increase in litigants in person’, he said.

He said a recent survey had found that 77% of judges with leadership responsibilities felt their work had increased significantly in the past three years, and that they were having to deal with an increasing number of complex matters in addition to their daily court sittings.

More effort needs to be made in explaining 'the importance of the judicial system in maintaining a just and fair society, accountable and democratic government and a strong economy', he said. Further to this, he stated that ‘no satisfactory means of funding the provision of our system of justice has yet been achieved’.

The Ministry of Justice responded to this by stating ‘As the justice secretary has said, our courts and tribunals need urgent reform. That is why we are investing over £700m to transform and modernise the courts and tribunal service. We are determined to deliver the swift and certain justice that the public rightly expects’.

The full report can be accessed [here](#).

**New Format Bill of Costs Is Delayed**

It has been said that it is too soon to press ahead with the plan to make the new electronic bill of costs mandatory because of the ‘major implications’ it would have for the profession.6

The Civil Procedure Rule Committee (CPRC) decided last month that ‘the matter needed to be given careful further consideration by the Ministry of Justice and by the committee and that it was too soon for any decision to be taken’, according to newly published draft minutes of its meeting.

The decision came on the back of a consultation on the proposed new format bill of costs undertaken by the Hutton committee, which was set up to make recommendations on a new bill as called for in the Jackson report, and the voluntary pilot that started in October 2015 in the Senior Court Costs Office.

This began with a view to becoming mandatory in April 2016, but just two weeks later, the CPRC decided that this would not happen before October 2016 ‘at the earliest’ while the views of the Ministry of Justice and HM Courts and Tribunal Service were sought.

The Hutton committee had recommended to last month's meeting that the new bill become compulsory from October, but there is now no timeframe for the new bill to be introduced, if it is to be at all. The Law Society is going to survey its members and the Ministry of Justice will then consider the issue.

It aims to be a self-calculating, self-summarising spreadsheet document based on the J-Codes, which are electronic time recording codes to be used by fee-earners.

It has been said that the move from paper to electronic assessment is a huge change that will required substantial investment in new infrastructure from practitioners and many have not made this to date because they have been uncertain about the implementation of the bill of costs. The committee recommend that the new bill be introduced without a pilot for all work undertaken after a given date on cases which were or could be subject to costs management orders.

Claire Green, policy officer at the Association of Costs Lawyers and member of the Hutton Committee, said: ‘In light of the majority of responses from our members to the suggested new format bill, the complex nature of the bill and associated practical implication that swift implementation would have caused, we are pleased that further consideration will be given to such an important issue affecting the entire legal profession’.

**Feature**

**New CLB Guidelines For The Diagnosis & Quantification of NIHL**

**Introduction**

The CLB 2000 Guidelines⁷ are routinely used in the diagnosis of noise induced hearing loss (NIHL). However these guidelines do not present a method for quantification of NIHL.

The same authors have now produced new guidelines on the quantification of NIHL⁸ thereby overcoming the shortcoming of the original guidelines. These new guidelines are proposed as an extension to the original guidelines but also provide 3 modifications to the method of diagnosis under the original guidelines. This feature will focus on these 3 modifications and will look at the new guideline’s method of quantifying NIHL, with worked examples. This is the first in a two part feature, next week we will provide an analysis of over 10,000 audiograms to see how the new guidelines would affect NIHL disability assessment, quantum and, if they were also extended into diagnosis, the percentage of claims which would satisfy a finding of NIHL.

**The Rationale to the Guidelines**

The new CLB guidelines assume that the ‘anchor point’ threshold values—typically at 1 and 8 kHz—will to some extent be affected by NIHL. To assume that the thresholds at the anchor points are purely down to AAHIL will under-estimate the NIHL component. The new guidelines offer a method for estimating the NIHL at the anchor points and obtaining AAHIL data against which to better compare the claimant’s hearing thresholds and most accurately quantify the NIHL.
The current methods of quantifying NIHL were considered in our feature article in BC Disease News edition 112 and can be assessed here. For the sake of brevity the contents of the feature are not repeated but the reader may well find this useful background reading.

The Methods Under the New Guidelines

The new guidelines propose a ‘simple method’ and a ‘full method’ to quantify NIHL. The simple method can be used in the vast majority of cases and is as follows:

The simple method

1. Carry out the row f bulge calculation as per the original CLB guidelines but with certain modifications - see worked example in appendix below;
2. At the frequencies 1, 2 & 3 kHz correct any negative row g bulge values to zero;
3. Having corrected any negative values calculate the average thresholds at 1, 2 & 3 kHz for each ear;
4. Uplift the averages in each ear by 1/3 rd;
5. Apply the results in 4 above to determine the average binaural loss using the ‘DSS formula’ i.e. [4 x average in better ear]+[average in worse ear] / 5.

The authors state that the simple method should not be used where:
(a) the maximum NIHL is at 3 kHz;
(b) there is a deep notch (undefined within the guidelines) at 4 kHz.

In these cases the full method below should be used.

The full method

1. Carry out the row f bulge calculation as per the original CLB guidelines but with certain modifications - see worked example in appendix below;
2. Estimate the NIHL damage at the anchor points:
   - At 1 kHz the NIHL damage=the row g bulge calculation at 4 kHz x 0.15
   - At 8 kHz the NIHL damage=the row g bulge calculation at 4 kHz x 0.40
   [Correct any negative values to zero]
3. Subtract the NIHL damage, as calculated above, from the anchor point thresholds to work out your modified anchor point values i.e. the true AAHL values at the anchor points;
4. Repeat a CLB analysis but now using the modified anchor point values [Note: modification of the anchor points may mean that different AAHL data best fit and are appropriate from that used in the initial CLB analysis-but the best fit is still at the claimant’s age and just looks at the range of hearing for that age at the 25th, 50th and 75th percentiles];
5. Apply the new bulge calculations at 1, 2 and 3 kHz in each ear to work out the binaural average using the ‘DSS formula’ i.e. [4 x average in better ear]+[average in worse ear] / 5.

Full worked examples for the short and full methods are shown within the appendix.

Where the New Guidelines Cannot Be Used

The authors state that the new guidelines cannot be used where ‘exposure has involved very high noise levels (daily personal noise exposure levels greater than 105 dB(A))’.

Modifications To The Existing Diagnostic Guidelines

The authors also make 3 important modifications to the existing diagnostic guidelines:

Interpolation
A ‘logarithmic interpolation’ (and not linear interpolation) should be used to calculate the ‘line e’ interpolated misfit values within the CLB calculation.

Selection of AAHL values
Within the original guidelines it was recommended that AAHL data up to 10 years above or below the claimant’s actual age could be consulted in determining the best fit with the thresholds at the anchor points.

Now it is recommended ‘that the range of selected AAHL statistics should be restricted. The selected AAHL statistic should be for the claimant’s age at the time of examination or the nearest age on the chosen database, which may be in intervals of 5 years, as in the original Guidelines’.

Note that the new guidelines now reference AAHL data from ISO 7029 (2000) rather than the 1984 version in the original guidelines.

A comparison of the 2 versions is shown in the table within the appendix. It can be seen that generally there is little difference between the datasets.

Use of 6 kHz as an upper anchor point

Within the original guidelines 6 kHz could be used as the upper anchor point where there was a ‘precipitous fall-off’ in hearing at 8 kHz.

Use of 6 kHz as an alternative anchor point is no longer recommended. Instead the threshold at 8 kHz is now estimated by the user by extrapolating out from thresholds at lower frequencies. So you plot the audiogram results up to 6 kHz against a best fit percentile curve for AAHL and then best predict what the 8 kHz threshold should be.

Other points

Over-diagnosis where constitutional losses

The new guidelines state at the top of page 4: ‘…there may be additional hearing loss over and above AAHL that is not attributable to NIHL and needs to be allowed for. For example, not infrequently there is a component of sensorineural hearing loss at low and mid frequencies that is greater than AAHL (which is minimal at low and mid frequencies); it cannot be attributable to NIHL as the frequencies are too low to be affected by noise when there is only mild or moderate NIHL. Such additional low-mid-frequency hearing loss appears to occur commonly in older people. Using standardised AAHL curves would fail to allow for such additional hearing loss; if standardised AAHL values were simply subtracted from the measured hearing...’
thresholds to estimate NIHL, the magnitude of NIHL would be inflated in the low-mid-frequency region.”

Are the new guidelines accepting a failing within the original diagnostic guidelines that resulted in over-diagnosis of NIHL where the audiometric pattern was more likely one of constitutional losses rather than NIHL? It is not uncommon that the ‘row g’ CLB calculation shows a diagnostic bulge somewhere between 3-6 kHz but that bulge also extends below 3 kHz into the lower frequencies which are less affected by noise as shown in the example below. Arguably such losses are not due to NIHL but a common pattern of constitutional loss.

Conclusion

We should remember that these new guidelines represent nothing more than the viewpoint of the 3 authors. The guidelines have not been reviewed and critiqued by the medico-legal community. They have not been judicially considered.

It is not immediately apparent that the rationale behind the new guidelines is correct - namely noise damage at the anchor points. ISO 1999: 2013 Acoustics - Estimation of noise-induced hearing loss (referenced within the new guidelines) suggests that at daily noise exposures of 85 and 90 dB(A) Lep,d there is no noise damage at 1 kHz - even after 40 years of exposure. Noise damage at 1 kHz only arises with noise exposures of 95 dB(A) Lep,d after 10 years and above. If that is correct than these new guidelines would appear to have no application in the vast majority of NIHL claims we see today which involve minimal and modest noise exposures.

We should not automatically move towards acceptance and application of the new guidelines.

Our second feature in this series will provide an analysis of over 10,000 audiograms to see what effect these new guidelines would have on NIHL disability assessment, quantum and, if used for diagnosis, the percentage of claims which would satisfy a finding of NIHL.
Let us assume a hypothetical male claimant aged 65 with 20 years exposure to daily noise of 90 dB(A) Lep,d without hearing protection. The claimant’s measured hearing thresholds in the right and left ears are as follows:

<table>
<thead>
<tr>
<th>Ear</th>
<th>Hearing thresholds (dB) at frequencies (kHz)</th>
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<tbody>
<tr>
<td></td>
<td>0.5</td>
</tr>
<tr>
<td>Right</td>
<td>10</td>
</tr>
<tr>
<td>Left</td>
<td>10</td>
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</table>

In this example the AAHL data at the 50th percentile for the claimant’s age is also the best fitting AAHL data but note under the new guidelines it is no longer acceptable to ‘best fit’ the AAHL data by going up or down 10 years from the claimant’s age. It is now necessary to use the data at the C’s age or the nearest age group.

Simple method

1. Carry out the CLB analysis with modifications-see below
2. Correct any negative values at 1, 2 or 3 kHz in your row g bulge calculation to zero (none in this example);
3. The right ear is the ‘better ear’ with average row g thresholds over 1, 2 and 3 kHz of 3.33 dB;
4. The left ear is the ‘worse ear’ with average row g thresholds over 1, 2 and 3 kHz of 5 dB;
5. Uplift each of the averages by a 1/3rd-so the average in the right ear is now 4.44 dB and the average in the left is 6.66 dB;
6. Input the uplifted averages into the ‘DHSS formula’ to work out the average binaural NIHL-

\[
\text{Average} = \frac{4 \times 4.44 \text{ dB} + 1 \times 6.66 \text{ dB}}{5} = 4.88 \text{ dB}
\]

Full method

1. Carry out the CLB analysis with modifications as above;
2. Estimate the NIHL damage at the anchor points in each ear (in this example the calculation is the same for both ears):
   - At 1 kHz the NIHL damage = the row g bulge calculation at 4 kHz x 0.15 = 12 dB x 0.15 = 1.8 dB
   - At 8 kHz the NIHL damage = the row g bulge calculation at 4 kHz x 0.40 = 12 dB x 0.40 = 4.8 dB
   [Correct any negative values to zero-none within this example].
3. Subtract the NIHL damage, as calculated above, from the anchor point thresholds to work out your modified anchor point values-i.e. the true AAHL values at the anchor points:
   - At 1 kHz the modified anchor point = 10 - 1.8 dB = 8.2 dB
   - At 8 kHz the modified anchor point = 60 - 4.8 dB = 55.2 dB
4. Repeat a CLB analysis but now using the above modified anchor point values [Note: modification of the anchor points may mean that different AAHL data best fit and are appropriate from that used in the initial CLB analysis-albeit looking only at the different percentiles for same age bracket];

<table>
<thead>
<tr>
<th>Frequencies (kHz)</th>
<th>0.25</th>
<th>0.5</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>6</th>
<th>8</th>
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<td>Modified HTL</td>
<td>10</td>
<td>8</td>
<td>25</td>
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<td>Modified HTL Anchor</td>
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<td>55</td>
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<tr>
<td>AAHL</td>
<td>14</td>
<td>13</td>
<td>11</td>
<td>19</td>
<td>28</td>
<td>41</td>
<td>47</td>
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<tr>
<td>Misfit values at anchor points</td>
<td>-3</td>
<td>-1</td>
<td></td>
<td></td>
<td></td>
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<td></td>
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<tr>
<td>Interpolated misfit values</td>
<td>-2</td>
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<td>-2</td>
<td>-1</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Modified AAHL</td>
<td>8</td>
<td>17</td>
<td>26</td>
<td>39</td>
<td>46</td>
<td>55</td>
<td></td>
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<tr>
<td>Modified bulge (dB)=NIHL component</td>
<td>2</td>
<td>8</td>
<td>9</td>
<td>16</td>
<td>19</td>
<td>5</td>
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<td>Frequencies (kHz)</td>
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5. Deduct the modified AAHL calculation from the original hearing threshold levels. This modified bulge calculation=the NIHL component

6. Apply the modified bulge calculations at 1, 2 and 3 kHz to work out the average binaural NIHL using the ‘DHSS formula’-i.e. 
   \[4 \times \text{average in better ear} + \text{average in worse ear}] / 5. 
   - Average in right ear over 1,2 & 3 kHz=2+8+9/3=6.33dB 
   - Average in left ear over 1,2 & 3 kHz=2,8,14/3=8dB 
   \[4 \times 6.33]+[8]/5=6.66 dB

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References


3 Ravenscroft v IKEA (unreported, 17 December 2015 (CC(Manchester)).


9 The 1984 data is replicated from the original CLB guidelines. This AAHL uses ISO 7029 (1984) which has had its baseline values at 1,2,3,4,6 & 8 kHz adjusted by 2.0, 3.0, 4.0,6.0,7.0 and 7.5 dB respectively. The same baseline adjustments have been made in the table values above for ISO 7029 (2000).
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