Ill-health retirement: a survey of decision making by occupational physicians working for local authority fire and police services

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Aims
To investigate the effect of qualifications, experience and service on ill-health retirement decisions made by police force and fire brigade medical advisers.

Methods
Doctors advising UK fire and police authorities attending a conference were given 16 case summaries from experienced fire and police advisers and asked to predict the outcome in terms of return to work or ill-health retirement. The answers were scored by assessing whether the outcome predicted by the participant agreed with the case setter. Correlation coefficients were calculated and a κ coefficient was determined for assessing inter-participant variation.

Results
Forty-seven doctors attended, 44 participated and the responses of 39 (86%) were analysed. Over half the doctors participating had held their post for less than 5 years. The majority (>50%) agreed with the case setter in 11 case summaries and in five cases the agreement was strong (>75%). The majority disagreed in five cases, with ≥80% dissenting in three cases. There was wide variation in the inter-participant variation (κ = –0.333 to +0.5) but the total agreed score correlated significantly (P < 0.05) with experience and service as a fire or police adviser (κ = 0.33) and ill-health retirement agreement correlated significantly with experience (κ = 0.49). There was no correlation between the level of qualification and total correct decisions.

Conclusions
Whilst we found general agreement overall, our results suggest that there is inconsistency in ill-health retirement decision making by police and fire service medical advisers in certain cases. Experience appears to improve the likelihood of agreement in decision making.

Key words
Agreement; concurrence; disagreement; premature or medical retirement; resumption of duty.

Introduction
Irrespective of the nature and purpose of the organizations they serve, occupational physicians spend a higher proportion of their time on fitness for work and sickness absence assessments than in any other activity [1]. Most employees will be able to resume their duties, but some will not and, unless the workplace or job can be modified or alternative employment found, the employee will have to be prematurely retired.
The criteria to be satisfied before ill-health retirement can be granted vary quite widely depending on the organization concerned and the rules of its pension provider. These can vary from inability to carry out the duties of the current post to the much more rigorous criterion of being unable to return to any gainful work at all prior to retirement age. As might be expected, organizations with strict criteria have lower rates of ill-health retirement, although other characteristics, such as principal causes of ill-health retirement and the times at which the greatest numbers of ill-health retirements occur, vary much less [2].

In 1994 Elder et al. [3] published a paper in which they reported the results of a survey of occupational physicians who provided advice to local authorities. The physicians were presented with 10 short case histories of individuals who had applied for ill-health retirement and asked whether they would accept or reject each application. While there was more likelihood of assent being given to the retirement of older job holders with significant respiratory or arterial disease, younger operatives with mental health or orthopaedic problems were less likely to be recommended for retirement. From an overall view, the χ² statistic was calculated as 0.23, indicating widespread disagreement [3].

Over the last two decades ill-health retirement rates have dramatically increased, particularly in the public sector, thereby putting immense pressure on pension funds [4,5]. Interestingly, there is a considerable variation in ill-health retirement rates between organizations, even organizations performing similar functions. For example, in fire brigades in the year 1998/1999 the percentage of full-time firefighters taking ill-health retirement varied between 0.25 and 3.4% of the establishment [6]. This led to concerns amongst employers, employees and pension fund providers that occupational physicians might be working in an inconsistent fashion and had implications for all those involved in the process. While there have been some significant reductions in ill-health retirement rates in recent years [7] concerns remain and the government has made a reduction in work-related sickness absence of 30% by 2010 one of the objectives of its occupational health strategy [8]. One of the methods by which this is to be achieved is the wider use of rehabilitation, which would be available to all, irrespective of the cause of absence. By implication, this would reduce ill-health retirement.

General guidance has been published on the steps that should be taken before ill-health retirement is contemplated [9]. More specific information exists for those providing occupational health advice for teachers [10] and for fire and police service medical advisers, although to date this is principally concerned with whether specific health problems are compatible with recruitment and/or continued service [11,12].

This exercise was undertaken in order to determine the following.

1. Whether there had been any change in the extent to which other occupational physicians agreed or disagreed with decisions regarding ill-health retirement since the 1994 paper.
2. An assessment of the extent to which existing guidance assisted in producing a more uniform outcome.
3. An exploration of the extent to which level of qualification, length of time as an occupational physician in general and length of service as a fire or police adviser in particular correlated with agreement with the decisions made by the occupational physicians who submitted the cases.

**Methods**

Four of the authors (W.W.D., J.R.H., I.S.R. and A.S.-P.) summarized between six and eight cases taken from their occupational health practices since 1 November 1997, when changes occurred in firefighters’ and police officers’ entitlement to sick pay. Half these cases ended in ill-health retirement and the others in return to work. Another of the authors (C.W.I.) then selected four cases from each author in order to produce a mix of cases that resembled routine occupational medicine practice and randomly allocated the 16 cases throughout the document. This was offered to the doctors attending the Association of Local Authority Medical Advisers (ALAMA) conference in November 2000. The 16 cases are listed in the Appendix.

Biographical information was also collected from the participants, including their highest postgraduate qualifications in occupational medicine, length of experience in the speciality and the year that the respondent began providing occupational health advice to fire brigades or police forces. Anonymity was allowed if wished. The delegates were allowed 30 min for studying all the cases and predicting the outcome, either ill-health retirement or return to work, that occurred in each case. They were allowed to confer and were urged to come to a decision one way or the other, but were allowed a third option, ‘something else’, if they felt really strongly that neither return to work or ill-health retirement were appropriate.

Each completed questionnaire was assessed and the answers entered on a Lotus 1-2-3 spreadsheet. Each answer was graded as ‘consistent’ or ‘inconsistent’, i.e. whether it agreed or disagreed with the outcome as determined by the author who submitted the case. Any other answers were placed in the ‘something else’ category. The biographical information was also incorporated on the spreadsheet.

Minitab (version 12) was used for deriving descriptive statistics and Pearson’s correlation coefficient between
the score and experience in the speciality and the score and length of service in the police or fire service. Spearman’s rank correlation coefficient was used for determining the relationship between the score and level of qualification.

A \( \kappa \) coefficient was calculated by Dr R. Knill-Jones for each of the 39 participants.

**Results**

Cases 1, 4, 12–14 and 16 were granted ill-health retirement, while the remainder returned to duty.

The maximum number of doctors attending the conference was 47. Forty-four questionnaires were returned, of which 39 (89%) were eligible for analysis. The five that were excluded were those that belonged to the four authors who submitted cases and one from a consultant who, although working for a local authority, did not have any responsibility for firefighters or police. However, since there were only three in the initial sample with the highest qualification (fellows of the Faculty of Occupational Medicine) the results were additionally reworked by including the responses from the consultant and the case contributors (three fellows and one associate). The two fire service medical advisers were marked only on their responses to the police scenarios and vice versa. Their scores were then doubled. The \( \kappa \) coefficient was calculated using the scores of the initial 39 participants.

**Total scores**

Correct scores for all participants (44) ranged from 6 to 12 with a median of 9 and a mean of 8.7 (SD = 1.53) (Table 1).

From this point onwards analysis was confined to the 39 fire and police participants who were able to attempt all 16 cases. This shows the response to each question, in terms of agreement or disagreement with the outcome, as determined by the case provider. With regards to agreement, over 79% of the respondents agreed with the decisions to allow return to work in five cases (cases 5–7, 10 and 11), while more than 61% concurred with the outcome in an additional three cases (to retire cases 13 and 16 and to allow return to work in case 15). Fifty-one percent of those replying agreed with the action taken in 11 of the 16 vignettes (to allow return to work in cases 2, 8 and 9). The cases that produced the greatest disagreement with the case provider’s decision were numbers 4 and 14, where over 80% disputed the granting of ill-health retirement for personnel suffering from orthopaedic problems.

Table 2 summarizes the respondents’ length of experience in occupational medicine generally and specifically as fire and police force medical advisers and the range of scoring, extent of agreement and \( \kappa \) coefficients expressed for each level of qualification. The small numbers involved in each level of qualification made further statistical analysis very difficult.

Collectively, the mean lengths of occupational health experience and service as fire/police medical advisers and ranges suggested a very skewed distribution. The median figures were 14 and 4.5 years, respectively. There was no statistically significant difference between the mean and median values in this respect whether the group was 39 or 44 strong. The agreement scores for the 39 respondents

<table>
<thead>
<tr>
<th>Case number and result</th>
<th>Agree</th>
<th>Disagree</th>
<th>Other</th>
<th>Consensus</th>
<th>Agree (%)</th>
<th>Disagree (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 (Ill-health retirement)</td>
<td>11</td>
<td>24</td>
<td>4</td>
<td>69</td>
<td>28</td>
<td>62</td>
</tr>
<tr>
<td>2 (Return to work)</td>
<td>21</td>
<td>15</td>
<td>3</td>
<td>58</td>
<td>53</td>
<td>38</td>
</tr>
<tr>
<td>3 (Return to work)</td>
<td>4</td>
<td>30</td>
<td>5</td>
<td>88</td>
<td>10</td>
<td>77</td>
</tr>
<tr>
<td>4 (Ill-health retirement)</td>
<td>3</td>
<td>32</td>
<td>4</td>
<td>91</td>
<td>8</td>
<td>82</td>
</tr>
<tr>
<td>5 (Return to work)</td>
<td>31</td>
<td>7</td>
<td>1</td>
<td>82</td>
<td>79</td>
<td>18</td>
</tr>
<tr>
<td>6 (Return to work)</td>
<td>35</td>
<td>4</td>
<td>0</td>
<td>90</td>
<td>90</td>
<td>10</td>
</tr>
<tr>
<td>7 (Return to work)</td>
<td>32</td>
<td>4</td>
<td>3</td>
<td>88</td>
<td>82</td>
<td>10</td>
</tr>
<tr>
<td>8 (Return to work)</td>
<td>20</td>
<td>19</td>
<td>0</td>
<td>51</td>
<td>51</td>
<td>49</td>
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<td>9 (Return to work)</td>
<td>26</td>
<td>11</td>
<td>2</td>
<td>70</td>
<td>66</td>
<td>28</td>
</tr>
<tr>
<td>10 (Return to work)</td>
<td>31</td>
<td>6</td>
<td>2</td>
<td>84</td>
<td>79</td>
<td>15</td>
</tr>
<tr>
<td>11 (Return to work)</td>
<td>33</td>
<td>5</td>
<td>1</td>
<td>87</td>
<td>85</td>
<td>13</td>
</tr>
<tr>
<td>12 (Ill-health retirement)</td>
<td>19</td>
<td>19</td>
<td>1</td>
<td>49</td>
<td>49</td>
<td>49</td>
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<td>13 (Ill-health retirement)</td>
<td>24</td>
<td>13</td>
<td>2</td>
<td>65</td>
<td>62</td>
<td>33</td>
</tr>
<tr>
<td>14 (Ill-health retirement)</td>
<td>7</td>
<td>32</td>
<td>0</td>
<td>82</td>
<td>18</td>
<td>82</td>
</tr>
<tr>
<td>15 (Return to work)</td>
<td>25</td>
<td>11</td>
<td>3</td>
<td>70</td>
<td>64</td>
<td>28</td>
</tr>
<tr>
<td>16 (Ill-health retirement)</td>
<td>27</td>
<td>10</td>
<td>2</td>
<td>73</td>
<td>69</td>
<td>26</td>
</tr>
<tr>
<td>Totals (t)</td>
<td>349</td>
<td>242</td>
<td>33</td>
<td>1197</td>
<td>893</td>
<td>620</td>
</tr>
<tr>
<td>Maximum possible</td>
<td>624</td>
<td>624</td>
<td>624</td>
<td>1600</td>
<td>1600</td>
<td>1600</td>
</tr>
<tr>
<td>% of the maximum</td>
<td>56</td>
<td>39</td>
<td>5</td>
<td>75</td>
<td>56</td>
<td>39</td>
</tr>
</tbody>
</table>
were in the range 6–12 out of 16. The highest total score (12) was held by an associate. Another associate, two diplomats and two members scored 11 each. The extent of agreement rose with the level of qualification, but was only slightly greater than would be expected purely by chance. This is reflected in the levels of the $\kappa$ coefficient. As might be expected, the $\kappa$ coefficient level was highest in the fellows group (0.22), but surprisingly the next highest was in the group with no formal qualification (0.16). This reflects the greater length of experience of this group, both in occupational health generally and in fire and police work in particular.

The collective performance of the participants showed a correlation coefficient of 0.33 ($P = 0.042$) between the respondents’ total length of occupational health experience and total agreement score, of 0.49 ($P = 0.001$) between the respondents’ ill-health retirement agreement scores and total length of occupational health experience and of 0.33 ($P = 0.045$) between the respondents’ total agreement and length of service with the police/fire service. Spearman’s rank correlation coefficient was 0.053 ($P = 0.75$) between the respondents’ total correct score and level of qualification.

### Discussion

This survey showed that, although there was a general tendency of the participants to agree with the outcomes of the cases as reported by the case setters, the actual level of agreement was only slightly greater than that which would be expected purely by chance. This is partly because there were only five cases with strong levels of agreement, contrasted with two cases with high levels of disagreement. The degrees of correlation were at best moderate; that between the total ill-health retirement score and length of experience being 0.49 and that between the total correct score and length of experience being 0.30. Both these reached statistical significance, i.e. $P < 0.05$.

As far as we are aware this is the first time that this topic (consistency of outcomes) has been revisited since Elder et al.’s [3] publication in 1994. Our study had a slightly larger number of participants (39 versus 35) and more case summaries (16 versus 10). However, our participants were asked to predict the eventual outcome, whereas the 1994 respondents were required to consider whether a request for ill-health retirement was appropriate.

The organization and conduct of this exercise can be legitimately criticized on a number of grounds. First, the participants had no opportunity of meeting and examining the patients and inspecting clinical notes and other documents such as sickness absence records and accident reports.

Secondly, the scenarios depicted often evolved over the course of several months or, in some cases, years and to reduce this time scale to a couple of hundred words at the most might be considered a travesty. It was very difficult to portray more subtle but important aspects that affected the outcome, such as the patient’s desire to resume work, the doctor standing up for the patient’s best interests, pressure from managers or trades unions seeking resolution of a long-standing problem or the extent to which managers were willing to accept a given degree of risk. It is important to ensure that these non-medical factors are prevented from exerting undue influence on occupational physicians. Thirdly, the extent to which the problems were representative of routine occupational health practice. It is possible that the case providers selected some of their cases precisely because they were controversial or they were pleased with the outcome. Although the general nature of the cases chosen reflects the ranking of the main causes of sickness absence and ill-health retirement [2,12], a further source of selection bias was introduced by one of the authors (C.W.I.) when selecting the 16 cases for the exercise in order to produce an interesting case mix. Fourthly, it is difficult to ascertain the extent to which those attending the conference were representative of ALAMA membership in general (~220)
or of the 100 or so in particular who were fire and police advisers. Fifthly, the participants had little opportunity of preparing for the exercise: the conference programme merely contained an enigmatic item entitled ‘Would You or Wouldn’t You?—An Ill-health Retirement Exercise’. Finally, did the case selectors make the correct decision when dealing with the individual cases? The small numbers involved also made statistical analysis difficult.

The wide variation and the generally low level of the $\kappa$ coefficient (reflecting the relatively mediocre correlation between the respondents’ total correct scores, level of qualifications and length of experience as occupational physicians and advisers to fire brigades and police forces) is surprising, particularly as length of service is sometimes a surrogate of level of qualification. However, it is possible that further improvement in consensus might occur as the group gains experience, since almost 54% had held their posts as fire or police advisers for 5 years or less. It might be that those who provided advice to the small number of larger fire brigades or police forces would have a greater throughput of cases, thus acquiring experience more rapidly. Unfortunately, this hypothesis could not be tested since well over half the respondents chose anonymity.

We were surprised to find that the availability of guidance on the criteria for ill-health retirement has had little effect on improving the degree of consensus in a sample of those who offer medical advice to fire brigades and police forces in the UK. Arguably there has been regression, since the median $\kappa$ coefficient of 0.113 was less than that (0.23) reported by Elder et al. [3]. Perhaps the guidance is dated, imprecise or lends itself to subjective interpretation. This problem is not unusual, as shown by a paper in which a number of groups of health care professionals were shown an advance directive and asked how they would react to a simulated vignette. There were a wide variety of differing responses within and between the groups [13]. This wide variation may have implications for perceived fairness in granting ill-health retirement, particularly with the increasing tendency for pension schemes to require independent certification. For future exercises of this type it would be helpful to draw upon the advice of medical educators in order to make the scenarios more realistic, thereby remediing some of the deficiencies admitted by the authors.

Acknowledgements

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References

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Appendix: ALAMA quiz cases

Case 1

A 45-year-old male police officer with 23 years service who 3 years previously had suffered a fracture to the lateral third of his right clavicle from which, at the time, he appeared to make a good recovery. Three years on he developed persistent pain and reduced movement in his right shoulder and saw an orthopaedic surgeon who diagnosed post-traumatic osteoarthritis of the acromioclavicular joint that was subsequently excised. At that time the coraco-clavicular ligament and rotator cuff were intact. He made a good recovery and had a stable pseudoarthrosis. Three months after his surgery he returned to light office-based duties with the encouragement of his orthopaedic surgeon, who felt that it would take a further 6–12 months from the operation for him to regain sufficient fitness to resume more active duties. The officer made it clear that he wished to remain in the police service and was not actively seeking ill-health retirement.

One year after surgery he continued to experience
sensitivity and a burning sensation around the tip of his shoulder. A review examination by his orthopaedic surgeon suggested that he would have difficulties in returning to operational duties for the foreseeable future and would particularly continue to experience difficulty in driving anything other than very short distances. At that time the officer was performing office-based duties in his substantive role and appeared to be having no difficulty with that work. He continued to exhibit tenderness around the right shoulder, had difficulty abducting his shoulder more than 90° and at times had difficulty lifting objects of more than 3 kg in weight.

Case 2
A 52-year-old police officer suffered a nervous breakdown immediately after a severe bout of influenza in January 2000, which was the straw that broke the camel’s back. Although very happily married with three children and no financial or welfare issues, 3 months earlier he had been very upset when his daughter’s fiancé was found to be suffering from terminal cancer and died 3 weeks before the wedding. The officer received counselling through the welfare unit and was recovering well when their son was admitted to the same hospital with acute bacterial endocarditis in June 2000. This then led to a further and more severe breakdown. Prior to this prolonged sickness absence, the officer had an exemplary sickness record. The officer was then referred for private clinical psychology and found to have Beck Inventory scores in the severe range. The response to therapy was reasonable, but because of his length of absence he slipped into half pay as the sickness was not related to an injury on duty. The psychologist’s opinion was that the overall prognosis was poor in the short term, but a recovery within 3 months to consider a light duty role was possible. The officer asked whether consideration could be given to medical retirement. He had 3 years to serve to a full pension.

Case 3
A 45-year-old police officer was diagnosed with mild hypothyroidism and type 2 diabetes 18 months previously, now requiring insulin for control. Nine months ago he was feeling depressed and was admitted to the local accident and emergency unit, having taken a large overdose of insulin with intent to die. He was discharged under psychiatric care, but worried about meeting others in group therapy sessions; they might include criminals and others with whom he had dealings, so he was referred to a private clinical psychologist by his force. His domestic situation was very stable with no evidence of underperformance at work, but he had been very upset by the death of his mother 6 months earlier. Psychological tests showed severe scores on the Beck Anxiety, Depression and Hopelessness Scales. Careful counselling revealed some mild post-traumatic stress disorder, but not sufficient to consider eye movement desensitization reaction therapy. Following a series of counselling sessions the officer returned to work, but reassimilation proved difficult and the anniversary of his mother’s death led to regression and further sickness absence. After 12 months he was managing light work of only up to 6 h per day.

Case 4
A 36-year-old police officer with palpitations and transient headaches was thoroughly investigated by the local cardiology unit and found to have atrial fibrillation. Since he had left atrial thrombus he was heparinized and fitted with an in situ defibrillator with continuous cardiac record plus anti-coagulants and issued with a full defibrillator and analgesics to correct any atrial fibrillation at home. He works as a response officer who drives a police car, but is not an advanced driver so is not required to meet class 2 criteria. He currently has approximately two atrial fibrillation episodes a week, each corrected by the in situ defibrillator and approximately once every 2 weeks requires a full defibrillation at home. When this occurs he requires 30 mg of morphine for analgesia.

Case 5
A 39-year-old female police officer with 3 years service developed facial dermatitis after exposure to CS incapacitant spray. She was noted to suffer two further exacerbations of increasing severity on further exposure to CS incapacitant. She was referred to a consultant dermatologist for assessment who concluded that she had a contact reaction to an irritant substance or substances. Whilst not proven, it was felt likely that further exposure to CS incapacitant could cause exacerbation or recurrence of her dermatitis.

Case 6
A 39-year-old male police officer with just under 2 years service. At his pre-recruitment medical examination he was examined by another doctor who regarded him as fit for police recruitment at that time. His past medical history included some recurrent back pain while serving in the army, but this did not result in any sick leave and he maintained a high level of fitness. After 1 year’s service he was referred to the occupational health unit with a 7 month history of stiffness and pain in his right hip which was progressively deteriorating. His walking ability was restricted to half a mile and he was unable to run. He had been absent from police duties at that time for ~3 months. He had just been assessed by an orthopaedic surgeon who stated the X-ray of his pelvis was ‘rather dramatic’
and showed evidence of coxa vara, a predisposing congenital condition of the hip causing mechanical malalignment of the hip with mechanical disadvantage and secondary and premature osteoarthritis. X-rays confirmed severe degenerative osteoarthritis of the right hip with almost total obliteration of the joint space. He was listed for an uncemented total hip replacement. The officer underwent right-sided total hip replacement which significantly reduced the hip pain and improved his walking ability.

Case 7
A 52-year-old police officer had been admitted to hospital with signs and symptoms of appendicitis 13 months previously. At operation he was found to have a small growth in the small intestine, which was biopsied and found to be a carcinoid tumour. The officer then had a wedge resection of the small bowel. The consensus treatment by the oncologists was that, while there was evidence of spread of the carcinoid, because of the rather indolent nature of the disease no specific chemotherapy was required. The officer has episodic faecal incontinence and is absent from work with depression and anxiety. The condition makes active duties very difficult and there is some difficulty even with other irregular (i.e. non-operational) duties. Regular follow-up at 3-monthly intervals over 1 year show no evidence of tumour recurrence (by ultrasound scan) and his 24 h 5-hydroxy-indole acetic acid levels are normal.

Case 8
A 39-year-old female inspector with 23 years service, most of which had been spent in the criminal investigation department (CID), was promoted to inspector 2 years previously. When first seen she had been absent from work for 4 months suffering from anxiety symptoms and admitted to a considerably increased alcohol consumption. She had two young children and was studying for a degree in her spare time. This produced increasing pressures as her job was balanced against domestic commitments. She had returned to part-time working after the birth of her second child, but felt that she had to cope with a full-time workload. She believed that she had not received adequate training for her new role and felt unsupported by her senior management. She was receiving anxiolytic treatment from her general practitioner (GP) and was seeing a force counsellor. She was physically well.

At the time of her first consultation and in early subsequent consultations she made it clear that she saw early retirement on the grounds of ill-health as being the solution to her problems. With her symptoms continuing over a period of many months she was referred to a consultant psychiatrist who felt that she would be best assisted by a clinical psychologist and this was arranged through the force. The clinical psychologist felt that the officer was suffering from a severe but discrete episode of depression in an otherwise psychologically healthy individual and after 12 sessions of therapy the officer was able to return to CID duties. However, she continued to have difficulties with her short-term memory and instead of taking alcohol admitted to using Night Nurse to help her sleep. Although she felt that she was receiving better support from her new supervisor working in the complaints and discipline department she continued to find it difficult to deal with the deadlines and pressures of work and was frequently tearful whilst at work and during consultations with the force medical officer. She was referred back to the psychologist for further treatment sessions.

The psychologist felt that greater work needed to be done in respect of the officer’s personal rather than professional issues and arranged to see not only the officer but also her husband.

The officer continued to have difficulties in respect of working unsupervised and felt only able to continue to work within an office environment with high levels of supervision. She certainly did not feel fit and the force medical officer agreed at the time that she was unfit to return to general operational duties. She was then informed by her supervisors that her period of tenure in the complaints and discipline department would soon be coming to an end and a decision made about her long-term future.

Case 9
A 32-year-old very fit firefighter had transient minor neurological symptoms which annoyed him because they reduced his athletic performances. He was also concerned that his vision was slightly affected in one eye. He was investigated by the National Health Service. Brain scans showed some small plaques indicative of multiple sclerosis. Without treatment, he rapidly made a full recovery and was very keen to continue his career.

Case 10
A 48-year-old station officer who had spent many years as an instructor complained of fatigue, extreme sensitivity to noise, hearing loss and some psychosomatic features. He had just played a major part in the entry to service of a new type of appliance. He reported that the warning signals were extremely loud and they had to shout to be heard. The equipment was introduced on time, but there were many problems. His audiograms showed bilateral 4 kHz notches of 50 dBA.

Investigations showed that the warning tones were >100 dBA and the noise surveys did not take into account the instructor’s ‘worst case’ exposures.
Looking back at his past history, for the past 10 years there had been little change in his audiograms and, thus, no apparent evidence of a further possible noise-induced hearing loss. Investigations showed good correlations between his cochlear-evoked response audiometry and audiograms. However, a diagnosis of hyperacusis was made. There was also evidence of very high work-related pressures over the past 2 years.

**Case 11**

A 45-year-old firefighter and driver was found to have elevated anterior chamber pressures at a routine vision screen. On full field testing there was a slight left-sided loss in the inferolateral segments. He was treated conventionally.

**Case 12**

A 42-year-old firefighter failed his Chester step test at a routine periodic medical. On closer questioning he admitted to one minimal event of some mild chest pain in the previous year, but very little else. He smoked, his total cholesterol was 6.5 mmol/l, his high-density lipoprotein cholesterol was 1.2 mmol/l and he had a family history of myocardial infarction. Before a submaximal exercise test was performed in order to measure his VO$$\text{2}$$, he was sent for a stress electrocardiogram, which showed ST depression in several leads and further depression on recovery. The GP was informed and the firefighter was seen by the local consultant cardiologist. The cardiologist advised that it was an artefact and that he was fit for duty. The firefighter was very keen to get back. The GP was asked and supported the cardiologist. Do you return him to full duties?

**Case 13**

A 38-year-old firefighter with 20 years’ service developed symptoms of acute back strain following an operational incident and these were compounded by a fall from a horse a few weeks later. Over a period of weeks his symptoms and signs were indicative of a classic lumbar disc lesion. After 6 months’ incapacitation he underwent a successful lumbar discectomy. At a review consultation 10 weeks post-operatively, he reported freedom from symptoms. The firefighter indicated that his motivation to return to firefighting would depend on the risk of further injury and confirmation as to whether, should he experience a recurrence, it would be regarded as a service injury or not.

**Case 14**

A 38-year-old firefighter with 18 years’ service underwent embolization of a cerebral aneurysm following a sub-arachnoid haemorrhage 3 years earlier. He made an excellent recovery with no evidence of neurological deficit. The post-operative angiogram, 6 months after the original procedure, identified a leakage and he was re-admitted for a second embolization. A report was requested from his specialist with an assessment of the prognosis. The specialist opinion was as follows. ‘After aneurysm surgery of any sort there is undoubtedly a small ongoing risk of further haemorrhage. For direct surgical clippings, this equates to roughly 0.5% per patient per year. I cannot guarantee that this aneurysm will not grow in the future and some reports are suggesting that a regrowth of aneurysms is more common following embolization than following surgical clipping. In this context, I cannot guarantee that he will never have a subsequent subarachnoid haemorrhage. On the other hand, I have now treated over 100 patients with this technique in the last 4–5 years and so far none of them has had a delayed haemorrhage.’

**Case 15**

A 50-year-old firefighter with 26.5 years service had a history of recurrent episodes of back strain that tended to be aggravated by operational activities. At the time of his assessment he had nearly recovered following an 8-week spell of incapacitation. X-ray of his lumbar spine showed widespread lumbar degeneration and narrowing of his disc spaces at two levels. The firefighter indicated that he wished to retire because he believed he could no longer tolerate the pain associated with recurrences, he could no longer depend on the support and cooperation of his colleagues ‘to carry him’ and he was fearful of the risk of aggravation by firefighting duties.

**Case 16**

A 50-year-old firefighter with 24 years service has a history of recurrent episodes of back strain that tend to be aggravated by operational activities. At the time of his assessment he had nearly recovered following an 8-week spell of incapacitation. X-ray of his lumbar spine showed widespread lumbar degeneration and narrowing of his disc spaces at two levels. The firefighter indicated that he wished to be considered fit to return to firefighting duties because, for him, the continued benefits of employment considerably outweighed the effects of pain and the risks of aggravation associated with firefighting injuries.