The Development in the Field of Occupational Diseases in 2007

Annual report from the National Board of Industrial Injuries and the Occupational Diseases Committee

1. Introduction and summary

The National Board of Industrial Injuries and the Occupational Diseases Committee in 2007 continued the task of updating the possibilities of recognising occupational diseases in accordance with the most recent knowledge in the field.

Three principal meetings were held in the course of the year. At these meetings the Committee discussed three new reviews of selected disease themes. The themes were neck and shoulder pain, night-shift work and cancer and mercury-related diseases in the dental care sector. The reports were commissioned by the National Board of Industrial Injuries, in consultation with the Committee. They go through and summarise the most significant Danish and international survey results in the selected fields, with a view to assessing the correlation between the diseases and exposures in the workplace.

The outcome of the discussions was that the conditions for recognising ***chronic neck and shoulder pain*** were changed and that the group of persons who have the possibility of having this disease recognised as an industrial injury has been considerably enlarged. Now persons who have had work with quickly repeated movements of the upper arm/shoulder for a considerable number of years can obtain recognition as an occupational disease of chronic neck and shoulder pain. This change opens up the possibility that work in a great number of occupations other than industrial seamstresses, including a number of craftsmen's trades, various types of industrial work, warehouse and assembly work, etc., can now lead to recognition. Read more in ***chapter 2*****.**

With a new review on ***night-shift work and cancer*** (”Nightshift work and risk of breast cancer and other cancers”), it has also become possible for persons who have had night-shift work for a considerable number of years to obtain recognition of breast cancer. The claims first need to be submitted to the Occupational Diseases Committee. The Committee must recommend that, in the concrete case, there is a very likely correlation between the disease and the night-shift work. This is because, according to the conclusions of the review, there is only limited scientific documentation of a correlation. The Committee will again discuss the conditions for recognition of breast cancer after night-shift work when the International (WHO) Agency for the Research of Cancer (IARC), within a year, is expected to publish a new report on the correlation between cancer and night-shift work (”Shiftwork that involves circadian disruption”). If the new report gives new information with stronger causation documentation, this may in the long term have the effect that breast cancer as a consequence of night-shift work can be included on the list of occupational diseases. Read more in ***chapter 3.***

In December 2007 the Committee also discussed a new review on ***diseases/symptoms after exposure to metallic mercury in dental care***. The report concludes that the current documentation of any correlation between various diseases and symp-

toms in dentistry and exposure to mercury is very limited, but that it cannot be ruled out that a few persons who previously were in very intensive contact with mercury may have become ill because of their work. Such persons can in certain cases obtain recognition of their claim in accordance with the current requirements of the list of occupational diseases, or as an accident at work. Furthermore the subject will be discussed again at the end of 2008, when a comprehensive Danish register survey of the harmful effects of metallic mercury, made by the National Institute of Public Health (NIPH), is expected to be completed. The review and the register survey are the second and third steps in the Ministry of Employment's 5-point plan, which will ensure a thorough, scientific survey of the effect of work with mercury on the health of dental assistants and dentists. Read more in ***chapter 4***.

The National Board of Industrial Injuries and the Committee in 2007 discussed possible new review themes, and five ***new review projects*** were commissioned in the course of the year. The projects are offered by the Working Environment Research Fund. They pertain to the themes of degenerative diseases of the cervical spine, cancer diseases in hairdressers, jumper's knee, voice diseases and noise-related hypersensitivity/sound distortion. The Committee will furthermore, in 2008, discuss a number of new reviews commissioned in 2006. These reviews pertain to stress and heart diseases, stress and mental disorders, shoulder diseases as well as night-shift work and heart diseases. Read more in ***chapter 5***.

As a part of the workers' compensation reform, the Committee has had continued focus on possible ***overuse injuries as a consequence of cleaning and care work***. This theme was discussed several times in the period 2004-2006 and included contributions from various experts and reading of the most recent study results in the fields in question. However, as the studies s do not show any clear documentation of a correlation between diseases of the upper musculoskeletal system (hand, arm, shoulder and neck) and work within the two occupations, the National Board of Industrial Injuries and the Committee decided, in December 2006, to launch a special effort involving a close examination of the stresses of cleaning and care work in a number of concrete cases. For the assessment of these cases, very detailed information is being gathered regarding the stresses in cleaning and care work. This work is in full swing at the moment and is expected to be concluded in the course of 2008. Read more in ***chapter 6***.

The Committee also held nine meetings in the course of 2007 in order to discuss a number of cases regarding unlisted occupational diseases. The Committee has discussed a total of 214 cases, 60 per cent of which were recommended for recognition. See the summary of some of the interesting cases of the year in the relevant chapter below. The legal practice for recognition of occupational diseases has not offered much news in 2007. A couple of Supreme Court judgements support the practice of the National Board of Industrial Injuries and the National Social Appeals Board with regard to occupational diseases. Read more under ***other topics*** in ***chapter 7***.

The workers' compensation reform introduced a new and eased occupational diseases concept and a completely new list of occupational diseases for diseases reported on 1st January 2005 and later. The objective of the workers' compensation reform was that about 1,000 more occupational diseases claims should be recog-

nised each year as compared to before 2005. The provisional figures for ***the development in the field of occupational diseases after the reform*** show that the objectives are met for the first post-reform year of 2005, and that the trend for 2006 and 2007 resembles 2005. Furthermore there is a great increase in the number of reported occupational diseases, in particular from 2005 and later, of approximately 50 per cent. This indicates that the reform initiatives have led to increased focus on the field of occupational diseases, also among doctors, who have an obligation to report presumed occupational diseases. Thus, in 2006, approximately 18,500 claims were reported, compared to 12,000-13,000 claims per year before the reform. The trend in 2007 resembles 2006. Read more in ***chapter 8***.

The Committee has planned a number of ***principal meetings in 2008***. The Committee will be discussing a number of new reviews of stress and heart diseases, stress and mental diseases, shoulder diseases, hairdresser work and cancer, jumper's knee, diseases of the cervical spine and night-shift work and heart diseases. Furthermore, as mentioned above, the Committee will discuss a number of care and cleaning cases on the basis of the special effort mentioned above. The schedule of meetings appears from ***chapter 9***.

2. It is now possible for more people to obtain recognition of chronic neck and shoulder pain

2.1. New rules for neck and shoulder pain in the spring of 2007

The conditions for recognition of chronic neck and shoulder pain were changed in March 2007 with the publication of a new list of occupational diseases reported from 2005. The new rules for recognition open up for other occupational groups than industrial seamstresses obtaining recognition of their neck and shoulder diseases. Among others this will benefit industrial workers, slaughterhouse workers, fitters and painters.

There is no longer any requirement for precision work in fixated postures. The work must, on the other hand, have involved quickly repeated movements of the upper arm/shoulder, in principle for at least 3-4 hours a day and for 8-10 years. If the work has also involved bending of the neck, work with the neck and shoulder girdle in fixated postures or strenuousness, this may contribute to reducing the requirement to duration (but not to less than 6 years) and the number of movements.

The previous rules, which required static and monotonous precision work for many years, were particularly directed at industrial seamstresses. There are not very many of those left in Denmark. On the other hand, there are increasing numbers of reported claims from other occupational groups with manual work, and there are more types of work that will meet the new exposure requirements than before the changes.

The requirements to the disease chronic neck and shoulder pain (cervicobrachial syndrome) as such are unchanged. This means that there must be daily pain and moderate to considerable tenderness in several muscle areas of the neck and shoulder girdle.

The new rules for recognition apply only to claims that were reported in and after 2005 and thus are covered by the eased requirements to medical documentation. This is because there only is moderate (medium) causality evidence. Changing the rules for recognition in the cases that are assessed on the basis of the rules from before 2005 still requires a very high degree of evidence.

2.2. New review behind the new rules

Against the background of the new rules, the National Board of Industrial Injuries and the Occupational Diseases Committee have discussed a new review of chronic neck and shoulder pain. The report examines and assesses the most recent international and national research results regarding chronic neck and shoulder pain and shows that there now is medical documentation of a correlation between the disease and quickly repeated movements of the upper arms/shoulders for a considerable period of time.

Against the background of the Committee's wishes, and after repeated discussions of the subject during the reform work, the report was commissioned by the National Board of Industrial Injuries in 2005 through the Scientific Committee of the Danish Society for Occupational and Environmental Medicine (DASAM/Dansk Selskab for Arbejds- og Miljømedicin).

The report on chronic neck and shoulder pain is entitled "Chronic pain with physical findings in the neck-shoulder girdle and exposures in the workplace: A systematic review" and was written by two English occupational health scientists, Dr. Keith Palmer and Dr. Julia Smedley from Southampton MRC Environmental Epidemiology Unit, UK.

The review has furthermore been independently assessed and approved by two expert reviewers, Professor Peter Croft, Keele University, UK, and Professor Eira Viikari-Juntura, Finnish Institute of Occupational Health, Finland. Furthermore, written comments have been gathered from the members of the Scientific Committee of DASAM. The document was furthermore discussed at a one-day meeting with authors, reviewers, and the Committee. This means that the report reflects all the substantial results in the literature on neck and shoulder pain that is available to date.

The main conclusion of the report is that there is good (moderate) medical evidence of a causal relation between work consisting in quickly repeated movements of shoulder/upper arms for some time and the development of chronic neck and shoulder pain with daily pain and muscle tenderness.

Furthermore it appears that work involving flexion of the neck, static fixation of the neck and shoulder girdle and/or strenuousness of the shoulders can contribute to the development of the disease. These factors cannot be seen from an isolated point of view, however, but need to be present, in combination with the quickly repeated movements of shoulders/upper arms, in order to be of any significance.

The conclusions of the report can be summarised as follows:

Main conclusions	
Exposures	**Chronic pain of neck and shoulder**
Repeated shoulder movements (>15 shoulder movements/minute)	++ (Moderate evidence)
Repeated shoulder movements (>15 shoulder movements/minute) with flexion of the neck	++ (Moderate evidence)
Repeated shoulder movements (>15 shoulder movements/minute) with flexion of the neck and static load on the neck and shoulder girdle musculature	++ (Moderate evidence)
Flexion of the neck without repeated shoulder movements	+ (Limited evidence)
Static load on the neck and shoulder girdle musculature without repeated shoulder movements	+ (Limited evidence)
Strenuous work	+ (Limited evidence)
Precision work	0 (Insufficient evidence)
Lifting/manual handling	0 (Insufficient evidence)
Big physical work load	0 (Insufficient evidence)

2.3. Examples of claims recognised in accordance with the new rules

Recognition after work in the fishing industry for 6.5 years
A woman worked for 6.5 years in the fishing industry. Her work partly consisted in cutting frozen fish blocks and partly in lifting and handling boxes of fish weighing from 8 to 30 kilos. The work of cutting fish blocks and lifting boxes involved strenuous and quickly repeated movements of particularly the right shoulder, approx. 25-35 times per minute. The woman eventually developed pain of the neck and shoulder region, and a medical specialist found moderate to severe tenderness in several muscle areas of the neck and shoulder girdle on her right side.

The claim qualifies for recognition on the basis of the list. The fishing industry worker, in the course of the working day, performed quickly repeated movements of the right shoulder, more than 15 times per minute. Furthermore, as the work involved extremely quickly repeated shoulder movements 25-35 times per minute and some strenuousness, there are grounds for reducing the requirement to the duration of the exposure from 8-10 years to 6.5 years. She also meets the disease requirement that there must be daily pain and moderate to severe tenderness of several muscle areas.

Recognition after painter's work for 6 years
A man worked as a painter in a large painter's business for well over 6 years. His work mainly consisted in washing down, puttying/coating of walls, and painting of walls and ceilings. The work typically involved numerous movements of both shoulders, with an assessed average of about 20-30 per minute, for more than half of the working day. Furthermore, for large parts of the working day, the work was rather strenuous for the shoulders. Towards the end of the period he developed chronic neck and shoulder pain and was diagnosed by a medical spe-

cialist with moderate to considerable tenderness of several muscle areas of the neck and shoulder girdle.

The claim qualifies for recognition on the basis of the list. The painter made quickly repeated movements for a large part of the working day. As there were extremely quick movements 20-30 times a minute, and as the work furthermore involved strenuousness for the shoulders, the requirement to the duration of the exposure can be reduced from 8-10 years to, in this case, 6 years. The painter also meets the disease requirement as he has daily pain and pronounced tenderness of several muscle areas.

Recognition after work as an industrial laboratory technician for 9 years
A woman worked full time, for a little more than 9 years, in a pharmaceutical company as an industrial laboratory technician,. About 4 hours a day the work mainly consisted in control tasks, involving testing for toxins of the company's products for cell cultivation. Most of the work was performed in a sitting posture, with a pipette in sterile benches behind a glass plate. It involved frequent movements, about 20 times per minute, of the right upper arm/shoulder, which was halfway lifted away from the body. She developed severe neck and shoulder region pain, and a medical specialist diagnosed her with chronic neck and shoulder pain, with pronounced tenderness in several neck and shoulder areas, on the right side.

The claim qualifies for recognition on the basis of the list. The laboratory technician for 4 hours a day, and for a total of 9 years, 20 times per minute, carried out pipetting work with quickly repeated movements of the right upper arm/shoulder. The laboratory technician also meets the disease requirements as there is pronounced tenderness of the neck and shoulder on the right side and it appears that the work has been stressful for the right shoulder.

A summary of the report, which describes in detail the method and part conclusions of the report, is enclosed as Appendix 1.

The complete report can be seen on the website of the National Board of Industrial Injuries, www.ask.dk, under research and projects ("Forskning og projekter").

3. Night work and cancer

3.1. Opening for recognition of breast cancer after night-shift work for many years

At a meeting in November 2007, the National Board of Industrial Injuries and the Occupational Diseases Committee discussed a new review on the correlation between night-shift work, breast cancer and other types of cancer.

The National Board of Industrial Injuries commissioned the report in 2006 through the Working Environment Research Fund in order to get a review of possible correlations between night-shift work and different types of cancer. This happened in consultation with the Occupational Diseases Committee and because a recent Dan-

ish study showed that there was a certain increased prevalence of breast cancer in women who worked nights.

Against the background of the results of the report there was agreement that the Committee in future must be informed of breast cancer cases where there have been a number of years of night-shift work. The Committee will then make a concrete assessment of the possible causality in each case. The documentation is limited, however, and therefore it is not possible at present to include on the list of occupational diseases breast cancer as a consequence of night-shift work.

There was also agreement that breast cancer cases with a limited number of night shifts and cases regarding other types of cancer can be turned down by the National Board of Industrial Injuries without submission of the claim to the Committee. This is because there is very limited documentation of any correlation between night-shift work and breast cancer when night-shift work has occurred for a limited number of years and no documentation whatsoever of any correlation between night-shift work and other types of cancer.

Finally it was decided to discuss the issue again, probably towards the end of 2008, when the IARC are publishing their results of a big review of the evidence of night-shift work with circadian rhythm disturbances (see also paragraph 3.4).

3.2. Danish review behind the new practice

The Danish review was written by Medical Consultant and occupational medical scientist Henrik Kolstad, Aarhus University Hospital, and is entitled ”Nightshift work and risk of breast cancer and other cancers. A critical review of the epidemiological evidence”.

In the process of writing the report, Dr. Henrik Kolstad was assisted by Head of Research Jørgen H. Olsen, Danish Cancer Society, who functioned as project manager to the Scientific Committee of DASAM with a view to ensuring the standards for the evidence assessment, as well as two expert reviewers, Head of Programme, Senior Researcher Johnni Hansen, Danish Cancer Society, and Professor Anders Ahlbom, Karolinska Instituttet in Stockholm, Sweden. Both have previously made substantial studies in the field – with very different results. To this should be added assistance in the assessment from a quality assurance committee consisting of Professor Staffan Skerfving, Lund, Sweden, Medical Consultant Johan Hviid Andersen, Clinical of Occupational Medicine in Herning, Denmark, and Staff Doctor Susanne Wulff Svendsen, Clinic of Occupational Medicine in Aarhus, Denmark.

The **main conclusions** of the report, with regard to the correlation between night-shift work and cancer, can be summarised as follows:

There is **limited evidence** of a causal association between night-shift work and breast cancer (+).
There is **insufficient evidence** of a causal association between night-shift work and prostate cancer (0), night-shift work and colorectal cancer (0), and night-shift work and overall cancer (0).

As shown in the conclusions, there is at present insufficient documentation that night-shift work may also be the cause of other types of cancer apart from breast cancer.

A summary of the current Danish review, which describes in detail the method and part conclusions of the report, is enclosed as Appendix 2.

The complete report can be seen on the website of the National Board of Industrial Injuries, www.ask.dk, under research and projects ("Forskning og projekter").

3.3. Facts and theses on night-shift work and cancer

As appears from the report and Dr. Kolstad's presentation to the Committee meeting, breast cancer is one of the types of cancer that we actually know a great deal about. This also applies to the causes of breast cancer.

There is a prevalence of approximately 3,500 cases a year in Denmark, and approximately 50 per cent of these cases are attributable to natural and synthetic sexual hormones, alcohol and overweight as well as heredity. Tobacco as a sole factor is without significance, but there are indications that tobacco in combination with alcohol may be of significance. Heredity is also relevant, but only explains the disease in a few cases. We do not yet have any known knowledge of significant factors from the working environment. Breast cancer is to a certain extent also age-related, but only up to the menopause, when the curve flattens out.

Night-shift work is the first environmental factor associated with breast cancer. In order for work to be characterised as night-shift work, there must have been at least 7 hours' work within 24 hours, including the whole period from midnight until 5 in the morning. About 20 per cent of the European work force meet these requirements, but less than 1 per cent have permanent night-shift work – most of them have various rotation schemes with changing night-shift elements.

Several possible causalities in connection with night-shift work have been discussed. Such causalities include stress, for which there is poor documentation, lack of sleep/reduced sleep, where there is a likely correlation – i.a. because we sleep less than we did 100-150 years ago – as well as any exposure to artificial light during the night and lifestyle factors. To this should be added the effect of the cycle of melatonin production in connection with night-shift work.

Approximately 20 years ago there was found to be an increased prevalence of breast cancer in connection with places where there was much electric light. The melatonin hypothesis (the hormone thesis) was developed. According to this thesis, shifts in the night and day rhythm had the effect that the melatonin production, which contributes to the regulation of the circadian rhythm, was disturbed. This meant that a lot of studies, including experiments on rats and mice, were initiated.

Melatonin is a hormone generated in the brain. Melatonin contributes to the regulation of the circadian rhythm and the metabolism of the cells as well as the secretion of a number of other hormones. Usually the most melatonin is generated be-

tween 2 and 3 at night, when it is dark. Only very little melatonin is generated during the day when it is light.

Working in shifts, including work late at night, during the night and in the early morning, disrupts the natural circadian rhythm of the cells. This causes disturbance in the complex regulation of the metabolism of the cells of the body, including the processes that protect humans and animals against cancer. I.a. there is a change in the brain's secretion of the hormone melatonin, which helps protect the body, and in particular the female breast, against cancer.

Other factors than light exposure and melatonin production may possibly be significant. The body mass index (BMI) is i.a. a plus-factor, the prevalence of breast cancer being greater in chubby women than in slim women. The same applies to women who start menstruating at an early age and stop at a late age (late menopause). As a total, however, this is a general picture, there being no big difference in these factors in night shift and day workers. A previous thesis that cancer in night-shift workers was due to lifestyle factors has therefore only been partly confirmed in the report.

As shown in the report, one of the decisive weaknesses of the available studies is that it is not possible to make an exact estimate of how often night-shift work must have occurred. The information in the studies on night-shift work is superficial with imprecise information as to when the shifts were placed in the course of the evening and night, and only few studies state the duration of the shifts. As it is to be expected that the risk of cancer is closely associated with the number of night shifts, it is decisive that there should be good information on the accumulated number of night shifts, but none of the studies state this. Most of the studies, on the other hand, stated the number of years with night-shift work, a measure which is less specific and says nothing about the total number of night shifts.

3.4. Big international survey of night(-shift) work and cancer underway

After the Danish report was commissioned in the spring of 2006, the International (WHO) Agency for the Research of Cancer (IARC) in Lyon, France, has intensified its endeavours to examine and evaluate possible causalities in the field. It is now expected that the IARC publishes the results of a big survey within a year. When the Danish review was commissioned, however, it was expected in research circles that it might take several years before the IARC would review and make any conclusion in the field.

In October 2007, the IARC completed their work of reviewing, on a very large scale, the research in the field.

According to a press release from the IARC on 10th December 2007, it is now found that working in shifts involving circadian rhythm disturbances probably causes cancer in humans. This means that the IARC will categorize this type of work exposure under 2 A. It also appears that epidemiological studies have found that humans who work nights for some time have an increased risk of developing breast cancer as compared to people without night work. According to the IARC, these studies are consistent with animal studies which show that constant light,

dimmed light during the night or simulated jetlag may substantially increase the development of tumours. The studies also show that, among different types of shift work, the type including night work disturbs the circadian rhythm system the most and therefore is of the greatest significance for the development of breast cancer.

The details of the review will, according to the IARC, be published in a monograph by the end of 2008. Once the review becomes available, the Occupational Diseases Committee will discuss the subject again.

4. Diseases/symptoms after exposure to metallic mercury in dental care

4.1. Agreement on practice for mercury injuries

At a meeting in December 2007, the National Board of Industrial Injuries and the Occupational Diseases Committee discussed a new review of the correlation between exposure to metallic mercury in connection with work in dental care and the development of various diseases/complaints. The author of the review furthermore gave a presentation to the Committee of the method and results of the report.

After the meeting, against the background of the conclusions of the review, there was agreement that there still is not sufficient evidence that exposure to low doses of metallic mercury in connection with work in dental care leads to the development of various diseases and symptoms.

This means that the current rules will not be changed, but that diseases in the form of organic brain injury and kidney disease can be recognised, as previously, on the basis of the list of occupational diseases. This is possible if there has been very significant exposure for some time (equivalent to an accumulation of mercury in the urine of 500-600 nmol/l or more).

A mercury-related injury can also be recognised as an accident if it occurs as a consequence of actual mercury poisoning after exposure to a very large dose of metallic mercury for a short while. Foetal malformation with mental retardation in the child can, as previously, be recognised if the mother is poisoned after exposure to a large dose of methylmercury.

The unchanged rules mean that dental care employees who have reported various symptoms as a possible industrial injury will not at present obtain recognition as industrial injuries of their symptoms or any congenital malformation in their children, except where they were quite extraordinarily exposed compared to the trade in general.

Once a big Danish register survey has been completed in the autumn of 2008, the Committee will discuss the practice in the field again. The review as well as the register survey form part of a general action plan on mercury in dental care which was launched in 2006 by the Ministry of Employment.

4.2. The Danish review on mercury in dental care

The new report was commissioned by the National Board of Industrial Injuries, in consultation with the Occupational Diseases Committee, through the Working Environment Research Fund (Arbejdsmiljøforskningsfonden) in the spring of 2006.

The background was that a recent Norwegian study pointed out that work with mercury in dental care might possibly cause various diseases and complaints as well as congenital malformation in children. The National Board of Industrial Injuries and the Committee therefore wanted a thorough examination of whether there might be a possible correlation between exposure to (also small) doses of metallic mercury in dental care and the development of various diseases and injuries.

Such correlation might necessitate a change in the previous rules for recognition of mercury-related diseases and injuries on the list of occupational diseases. According to those rules there had to be substantial and long-lasting exposure or actual mercury poisoning (see paragraph 4.4.).

The review was written by Occupational Health Consultant and Scientist, Dr. MSc. Jesper Baelum and clinical assistant Heidi Pöckel from Odense University Hospital in Denmark. The report is entitled ”Reference document on exposure to metallic mercury and the development of symptoms with emphasis on neurological and neuropsychological diseases or complaints”.

The report was subjected to a critical examination by two expert reviewers, Professor Lars Barregard, Gothenburg, Sweden, and Dr. Andreas Seeber from Dortmund University, Germany. At a seminar in October 2007, a quality assurance committee consisting of Professor Svend Sabroe, Aarhus University, Denmark, and Professor Staffan Skerfving, Lund University Hospital, Sweden, participated with comments on the work. The comments of the reviewers and the quality assurance committee are incorporated in the final report.

The objective of the report was, against the background of a primarily epidemiologically based examination of the most significant international survey results in the field, to summarise and assess medical knowledge of particular relevance for the elucidation of any causalities between exposure to metallic mercury, including in particular the effect at a low-dose level for some time in dental care, and the development of diseases/complaints, including in particular diseases/complaints of a neurological and/or neuropsychological nature.

The report is divided into six chapters:

1. Introduction with a description of the general uptake and health effects of metallic mercury as well as a brief description of amalgam and its use in dentistry
2. Exposure to mercury in dentistry
3. Health effects of mercury in dentistry
4. Effects of mercury on the neuropsychological performance
5. Reprotoxic effects
6. Conclusions

The review's general assessment of the evidence (the scientific documentation of a correlation) between disease and exposure can be summarised as follows:

About the causality between disease and exposure	The evidence assessment
Exposure to metallic mercury with urinary mercury of 600 nmol/l measured in group studies leads to deterioration of performances in neuropsychological tests	**Strong evidence**
The neuropsychological effect of exposure to metallic mercury either decreases or is unchanged after cessation of the exposure	**Moderate evidence**
Exposure to metallic mercury in dental care equivalent to urinary mercury of 150 nmol/l in group studies means a slight deterioration in the performance in neuropsychological tests	**Limited evidence**
The onset of specific neurological or neuropsychological diseases or symptoms several years after exposure to mercury	**Insufficient evidence**
It is possible to delimit groups with increased risk of exposure to metallic mercury on the basis of gender or genetic disposition	**Insufficient evidence**
Negative effect on reproduction ability in dental care employees measured by way of fertility, miscarriages, reduced weight at birth, stillbirths or congenital malformations in children	**Insufficient evidence**

Examples of other conclusions of the report:

- The exposure to metallic mercury in dental care up to 1970 has corresponded to a biological dose of, on average, 125-200 nmol/l with individual measurements up to approx. 500 nmol/L. Thus the average urinary values gradually fell to about 25 nmol/L with individual values rarely in excess of 100 nmol/L
- Specific procedures have caused high air concentrations of mercury vapour, whereas urinary secretion of mercury only has been related to the number of performed fillings and particular factors regarding the furnishing of the clinics
- There is insufficient evidence of any difference in urinary mercury for dentists and for dental assistants
- There is no clear pattern for mercury-related neurological disease in dental care employees
- It cannot be ruled out that on a group basis there has been a minor deterioration of in particular motor coordination due to mercury exposure. This cannot be seen in individuals, but underlines the importance of keeping the exposure to mercury at an absolute minimum

The report also concludes that there is a need for additional and more detailed studies based on information from the Danish dental care sector over time.

A summary of the report, which describes in detail the method and conclusions of the report, is enclosed as Appendix 3.

The complete report can be seen on the website of the National Board of Industrial Injuries, www.ask.dk, under research and projects ("Forskning og projekter").

4.3. The background for the review – the mercury debate

The background for the review was a debate on potential mercury injuries in the dental care sector. The debate came about after Norwegian survey results in December 2005 pointed out that people with relatively little contact with mercury in connection with work in dental care may get permanent injuries and that contact with mercury may also lead to miscarriages and congenital defects in children.

The review is an integrated element (item 2) of the Ministry of Employment's action plan for mercury from October 2006. The plan consists of five successive measures:

1. **An internordic expert meeting** with a view to a scientific status as well as an examination of the possibilities of mutual Nordic co-operation
2. **An impartial examination of the literature in the field** with a view to creating a general overview of the existing knowledge by way of an occupational-medical review
3. **An epidemiological register survey.** By way of relevant registers a survey will be made of disease prevalences in dental assistants, dentists and other groups who, through their jobs, are or have been exposed to metallic mercury. Furthermore there will be an international conference to follow up on the results
4. **A clinical survey** of any prevalence of certain symptoms and diseases in a statistically randomly selected group of dental assistants who were in employment before 1985. The results from this group will be compared with a relevant, matching control group
5. **A targeted examination programme** for dental assistants and dentists who have complained of symptoms so that each of these persons is examined for symptoms and diseases which may be related to mercury exposure or for which the epidemiological survey has found an overfrequency

The status at the end of 2007 was that the first two initiatives had been implemented. A conference was held in 2006 by the National Research Centre for the Working Environment (Nationalt Forskningscenter for Arbejdsmiljø/NFA) and the new review was discussed by the Occupational Diseases Committee in December 2007.

Item number 3 – the big register survey – has been launched and is being undertaken by the National Institute of Public Health (Statens Institut for Folkesundhed). The survey is expected to be completed in November 2008. Once the first three measures have been implemented, they will be assessed in relation to the last two.

4.4. Current possibilities of recognising mercury injuries on the basis of the list

For a number of years the lists of occupational diseases have included organic brain injury (toxic brain injury/dementia) and kidney injury (nephrotic syndrome) after exposure to mercury and certain mercury compounds, as well as congenital defects in the form of mental retardation in children after the mother has been poisoned by methylmercury.

The conditions for recognition on the basis of the list are met if –

- the injured person has been directly and permanently exposed to metallic mercury for a number of years, which has led to a concentration of mercury in the urine of at least 500 nmol/litre urine, and has developed organic brain injury or kidney injury (nephrotic syndrome), or
- the injured person has been exposed to a large dose of mercury and in time correlation with this has developed mercury poisoning with organic brain injury or kidney injury (nephrotic syndrome) – the claim then in principle qualifies for recognition as an accident
- the mother, in cases regarding foetal malformation in the form of mental retardation, has been poisoned by methylmercury

Concrete claims which do not qualify for recognition on the basis of the list can in special cases be submitted to the Occupational Diseases Committee with a view to an assessment of whether it is likely, beyond reasonable doubt, that there is causality between the work and the disease, in accordance with the provisions of the Act on the special nature of the work.

5. New review projects underway

5.1. Current review projects

In the period 2005 to 2007, the National Board of Industrial Injuries commissioned a number of reviews in consultation with the Occupational Diseases Committee. Most of the review projects were advertised by the Working Environment Research Fund.

The Working Environment Research Fund advertises the review projects in the form of reference documents on occupational diseases. The reviews are used by the National Board of Industrial Injuries and the Occupational Diseases Committee in connection with the ongoing negotiations on the inclusion of new diseases on the lists of occupational diseases. Furthermore they are used for making adjustments of the practice of the Occupational Diseases Committee regarding the recognition of diseases not on the lists.

The scientific reference document (the review) will, against the background of a, primarily epidemiologically based, examination of the most significant international survey results in the field, elucidate in detail, summarise and assess any causalities between the work and the diseases in question. The reviews will in this connection include a description and an assessment of the evidence of various exposures and of

the likely causality mechanisms as well as a detailed estimate of the possibly increased risk in relation to the nature, intensity/extent and duration of the exposure.

The most recent reviews, which were commissioned through the Working Environment Research Fund, pertain to the following subjects (expected time for discussion is stated in parenthesis)

- Night-shift work, breast cancer and other types of cancer (November 2007)
- Mercury-related diseases/symptoms in dental care (December 2007)
- Stress and heart disease (January 2008)
- Stress and mental disorders (February 2008)
- Shoulder diseases (March 2008)
- Night-shift work and heart disease (end of 2008)
- Cancer diseases in hairdressers (end of 2008)
- Degenerative diseases of the cervical spine (end of 2008)
- Jumper's knee (end of 2008)
- Voice diseases (2009)
- Noise and hypersensitivity to sound/sound distortion (2009)

As set out in chapters 3 and 4, the National Board of Industrial Injuries and the Occupational Diseases Committee already discussed two of the above reports in 2007. Those two reports are the report on night-shift work and cancer and the report on mercury exposure in dental care. None of these reports has so far led to a change in the list of occupational diseases, but agreement has been reached that cases of prolonged and substantial exposure must be submitted to the Committee.

The National Board of Industrial Injuries has previously discussed four review reports which were commissioned through the Scientific Committee of the Danish Society for Occupational and Environmental Medicine (DASAM).

The reviews dealt with these subjects:

- PC work and carpal tunnel syndrome
- PC work and other diseases of the upper musculoskeletal system
- Degenerative arthritis of hips and knee
- Chronic neck and shoulder pain (see more in chapter 2)

The National Board of Industrial Injuries and the Occupational Diseases Committee have ongoing discussions about new review themes, and it is expected that there will be at least two new projects in 2008.

All reports from the completed review projects are published after concluded Committee discussions and can be seen on the website of the National Board of Industrial Injuries, www.ask.dk, under research and projects ("Forskning og projekter").

6. Special effort in cleaning and care work

6.1. More concrete insight into diseases in connection with cleaning and care work

At a meeting in December 2006, the National Board of Industrial Injuries and the Occupational Diseases Committee agreed to make a special effort to enhance the knowledge of stresses on hand, arm, shoulder and neck in connection with cleaning and care work.

The objective is to find out, by gathering detailed information in a number of concrete cases, if it is possible to get a better understanding of possible causalities between cleaning and care work and the development of various diseases of the upper musculoskeletal system.

The background for the special effort is that diseases of the musculoskeletal system as a consequence of cleaning and care work have been selected as special focus areas in the workers' compensation reform.

After several discussions of the most recent knowledge in the field it has become clear, however, that there is insufficient concrete knowledge as to how and to what extent various functions in connection with cleaning or care work are stressful for the hand, arm, shoulder and neck, and that in general it is hard to get detailed information on the individual functions and their real impact in the two occupations.

For the same reason it is difficult for the National Board of Industrial Injuries to assess whether more cases may meet the new and eased reform requirements of the list.

The effort includes several hundred selected cases regarding the selected disease areas. The National Board of Industrial Injuries first gathered detailed information from the injured persons on the disease and the exposures. Then occupational health surveys were launched which asked in detail about job functions and stresses in the workplace.

At one or more meetings in 2008, the Committee will discuss samples of the extraordinarily selected cases with a view to clarifying the exposures that may lead to recognition on the basis of the list and determining in detail the level of the requirements to the nature and extent of exposures.

The National Board of Industrial Injuries will furthermore ensure an ongoing follow-up on the research on cleaning and care work, assisted by external experts.

6.2. Previous focus meetings on cleaning and care work

Overuse injuries as a consequence of cleaning and care work were specially selected focus areas in the reform and have been part of the Committee's ongoing discussions of the new list of diseases reported as from 2005.

For both areas there have been several specific discussions of the medical evidence of the development of diseases after exposures in the workplace. There has been

particular focus on any correlation with diseases of the upper musculoskeletal system after overuse, i.e. after long-term physical stresses.

The Committee in 2004 and 2005 held special meetings on the medical documentation of possible correlations between disease and work in the two areas. Care work was discussed in October 2004 and again in December 2005. Cleaning work was discussed at a meeting in December 2004. External experts participated in all of these meetings, and they made presentations and conclusions on the most recent survey results.

The conclusion was that there is a general and broad overfrequency of disease prevalence in employees doing cleaning and care work. However, there is insufficient evidence of any clear correlation between certain types of exposures in connection with cleaning and care work and the development of diseases of the musculoskeletal system or other diseases.

The meetings also concluded that there is insufficient research into the more specific causalities. This applies not least to biomechanical studies measuring and estimating concrete loads on the musculoskeletal system in connection with different types of care and cleaning work.

It can be seen, on the basis of the most recent information from i.a. the National Research Centre for the Working Environment (NFA), that it is not possible to point to new research results about care and cleaning work that provide better documentation of possible causalities. Furthermore, the Danish research projects, including a major cleaning/care work project under the NFA, which will be completed in 2008, will mainly deal with work retention. There is no special research into the concrete causality mechanisms between diseases and exposures.

This means that, within the coming year, there will hardly be added any of the required detail knowledge of stresses on hands, arms, shoulders and neck in connection with, for instance, the use of a floor mop when cleaning.

The NFA recently started working on a white book, which is expected to be ready in about June 2009. The white book lists the literature and projects with national and international participation and will include a quantification of known risk factors that may lead to muscular diseases. The white book may possibly contribute to mapping special risk factors in connection with cleaning and care work, but is not particularly dedicated to these groups.

After the reform took effect in the field of occupational diseases in 2005, the National Board of Industrial Injuries has recognised a few claims regarding diseases of the hand, arm or shoulder after intensive cleaning work. Before the reform, diseases after cleaning work did not qualify for recognition at all, not meeting the requirements at the time that there had to be unvaried and very strenuous work functions.

In the care area, stresses are typically of a more sporadic nature with various handling of persons spread over the working day. There are no continuous exposures for at least half of a normal working day. Usually, therefore, care work will not

meet the requirements for recognition of diseases of the hand, arm, shoulder and neck – not even after the reform.

7. Other topics

7.1. Development in legal practice in 2007

The year 2007 did not offer much news in legal practice with regard to occupational diseases.

However, a couple of Supreme Court judgements were made. These judgements agree with the previous judgements made by the Western Division of the High Court and support the decisions made by the National Board of Industrial Injuries and the National Social Appeals Board (the defendant) not to recognise as occupational diseases the claims regarding a tennis elbow and a back disease respectively. The grounds for the judgement on the tennis-elbow claim were that the work was not sufficiently strenuous for the development of this disease. The grounds for the judgement on the back disease were that the lifting work was not sufficient to make it likely, beyond reasonable doubt, that the work caused the disease.

Supreme Court judgement of 19th April 2007 on tennis elbow (case number 483/2005)
The case was about a now 54-year woman who worked in a factory from 1995 to 2000 with the production of mobile phones. There was no substantial load on the musculoskeletal system apart from the fact that the work was quick and involved fixation of the neck and shoulder girdle. From October 2000 up to May 2001 she had a new work function as a test operator. Her work i.a. consisted in assembling and disassembling mobile phones as well as removing and fitting batteries. A short while after commencing this new work, she developed pain in her right hand, arm and elbow and was diagnosed with a tennis elbow. The claim was reported to the National Board of Industrial Injuries before 1st January 2005 and was therefore assessed on the basis of the list of occupational diseases applicable to claims reported before the workers' compensation reform took effect for occupational diseases. When turning down the claim, the National Board of Industrial Injuries took into consideration that there had not been considerably strenuous work movements, which is a requirement set out in group E, item 6(b) of the list, and that submission of the claim to the Occupational Diseases Committee would be futile. The National Social Appeals Board agreed with the decision of the National Board of Industrial Injuries to turn down the claim. Their grounds were that the work had not been sufficiently strenuous for the development of a tennis elbow. There had not been strenuous turning movements of the forearm, which is relevant for development of the disease. Nor were there grounds for submitting the claim to the Occupational Diseases Committee with a view to an assessment based on section 10(1)(ii), regarding the special nature of the work.

The Supreme Court agreed with the High Court judgement on the basis of the grounds stated by the High Court. It appears from the grounds that the work was performed using the tendons and muscles of the right hand and forearm and that the work, according to the Medico-Legal Council's assessment, involved strenuous elements for about one third of the working day. However, according to the Medico-Legal Council, it cannot be considered to have been proved that the work involved strenuous turning movements or twisting of the forearm. Against the background of the evidence, including that of the medical specialist consulted in the case, there are no grounds for setting aside the assessment made by the workers' compensation authorities, and thus the work cannot be characterised as strenuous. Therefore it is agreed that the disease is not covered by the list. Nor, according to the reply of the Medico-Legal Council, are there grounds for disregarding the workers' compensation

authorities' assessment, according to which the woman's disorder cannot solely or mainly have been caused by the special nature of the work (section 10(1)(ii)) of the same Act). Therefore the National Social Appeals Board is acquitted.

The Supreme Court's judgement of 17th January 2007 on low-back disease (case number 151/2005)

The case pertained to a man who, from 1977-78 to 1986, was employed as a skilled butcher in a slaughterhouse. As a skilled butcher his work consisted in assisting the master butcher in the whole slaughter chain. He worked partly as a substitute in the slaughter chain when they were short of men, and partly with picking up pig carcasses that had fallen down during the slaughter. He himself had stated that every day 25-50 pigs fell down, each weighing 60-80 kilos. To this should be added lifting of 8-kilo guts the remaining part of the working day. The injured person himself found that his daily lifting load was about 16 tonnes. The National Board of Industrial Injuries and the National Social Appeals Board had assessed the daily lifting load at somewhat less or about 5.6-7 tonnes and thus less than the 8-10 tonnes per day for 8-10 years required for recognition of a low-back disease. The claim had therefore been turned down on the grounds that there was no documentation of a daily lifting load which met the requirements for recognition of low-back diseases on the basis of the list of occupational diseases, and that there was no information of other extraordinary stresses on the low back which made it likely, beyond reasonable doubt, that the disease had been caused by the special nature of the work (section 10(1)(ii)). The Western Division of the High Court held the same view.

The Supreme Court agreed with the High Court's judgement, with the assessment of the evidence put forward by the High Court and in accordance with previous assessments of the claim, including the National Social Appeals Board's assessment of the daily lifting load.

7.2. The National Social Appeals Board's principal decisions on occupational diseases in 2007

The National Social Appeals Board in 2007 only made one new principal decision on recognition of occupational diseases. The decision pertains to hearing diseases.

In the principal decision (U-8-07 of 28th November 2007) the National Social Appeals Board found in two cases that the decision of the National Board of Industrial Injuries to turn down claims, with reference to the major part of the hearing loss having been caused by factors other than noise, should be changed to recognition of the same. The grounds put forward by the National Social Appeals Board are that the recognition pertained to that part of the hearing loss which, in accordance with the configuration of the audiogram, was attributable to exposure to noise and that it is not a prerequisite for recognition that there was a hearing loss that had effects that entitled the injured person to compensation. The National Social Appeals Board furthermore found that any competitive causes can be significant in relation to the total hearing loss and should be weighted in connection with determining any compensation. Thus the existence of competitive causes cannot give grounds for turning down the claim if at the same time a noise-related hearing loss has been established.

The National Social Appeals Board in 2006 expressed their principal view of the assessment of a number of selected occupational diseases on the basis of the new list of diseases reported on or after 1st January 2005. The principal decisions in 2006 have largely confirmed the decisions made by the National Board of Industrial Injuries and thus the current practice for assessment of occupational diseases on the basis of the new Act (the Workers' Compensation Act of 2003).

The principal decisions from 2006 have previously been described in the Occupational Diseases Committee's annual report for 2006 to the Parliamentary Labour Market Committee. All principal decisions made by the National Social Appeals Board can be seen on their website www.ast.dk.

7.3. The Committee's handling of concrete cases in 2007

In 2007, at nine case meetings, the Occupational Diseases Committee discussed a total of 214 concrete cases regarding occupational diseases.

Of these cases, 131 were recommended for recognition, 60 were recommended for turning down and 23 cases were postponed with a view to gathering further information prior to reassessment. The recognition percentage for the decided cases is 61 per cent.

The claims were submitted to the Committee with a view to an assessment, not on the basis of the list, but because of the special nature of the work. In order for a claim to be recognised without applying the list, the Committee must find that in the case in question there is a very likely correlation between the disease and the work.

7.4. Selected examples from the Committee's meetings in 2007

Recognition of depressive single episode (teacher exposed to severe harassment and bullying, including harassment of a sexual nature, from students)
A woman worked for a few years as a teacher in a municipal school for 6 to 16-year-olds. The last year she was exposed to repeated verbal and physical abuse from the students. She also experienced that half of the students did not attend her classes, that the remaining students taunted her and talked to her in deprecating terms, pushed her and behaved very boisterously. She also experienced an incident where a student grabbed her breasts and another where a student drew with a pen in her crotch area. Furthermore she experienced that a student was sexually harassed by three boys in one of the school toilets without any intervention from management. Finally she experienced that the parents did not back her up, called her all sorts of derogatory names and did not show up at meetings with her to discuss the problems. She also experienced that a student in one instance, in an email to another student, had threatened to kill her. The school was only able to verify a few of the described incidents, including one where a student had been expelled from class due to bad behaviour. However, colleagues were able to testify that there was a poor work environment with a lot of disturbance and poor backing from management. Eventually she developed mental symptoms in the form of anxiety, pressing thoughts, concentration problems, sensitivity to noise, sleep problems and isolation problems.

The Committee found it likely beyond reasonable doubt that the teacher had developed a mental disorder, in the form of a depressive single episode, as a consequence of the work. She had been exposed in the workplace to shouting, derogatory remarks, an unpleasant mail as well as remarks and actions of a sexual nature from some students.

Recognition of mixed anxiety/depression condition (social worker exposed to threats in home for young addicts)

A female social worker worked for well over 7 years in a home for young addicts. After approximately 6 years she became contact person to a young man who had been convicted with imprisonment due to several incidents of severe violence which occurred under the influence of alcohol. Shortly after moving into the home he started drinking, and he began to make threats that he was going to hit named persons with bottles, that he was going to cut out their eyes, etc. As the social worker for the same reason had to quarantine him, she was exposed to threats, in which connection the young man lashed out at her with a bottle. On a subsequent holiday trip she experienced that the same man nearly hit her in an angry fit. The stated stresses were confirmed by the employer. A short while after the last incident on the holiday trip, the social worker began to feel mentally ill with sleep problems, depressive feelings, concentration problems and fear that something might happen to her and her children. A medical specialist made the diagnosis of mixed anxiety/depression condition.

The Committee found it likely beyond reasonable doubt that the mixed anxiety/depression condition had developed as a consequence of the work in the home, where, in the period leading up to the onset of the disease, the social worker had been exposed to several serious threats from a young addict who was known to be potentially violent.

Recognition of unspecified stress reaction (nurse exposed to severe harassment and bullying from her medical superior and colleagues)

A nurse worked for 5 years in a medical department in a hospital. Towards the end of the period she was asked by a consultant to commit active euthanasia by giving a very sick patient a painkiller overdose. She could not carry out the order and some days later she anonymously reported the incident to the Danish Patient Safety Database. She could not, however, bring herself to report the consultant to the police, even though she was encouraged to do so. A short while later the consultant summoned a crisis meeting in which he called her a liar. He produced a copy of the anonymous report to the Danish Patient Safety Database and at the same time indicated that she had reported him to the police. The consultant subsequently criticised her way of co-operating and several colleagues took his side and became abusive towards her. The nurse experienced that co-operation deteriorated and that she was ostracized by the consultant and several others in the department. Other doctors furthermore signed a letter to management in which they stated that they were unable to co-operate with her. Several crisis meetings were held without any result, and in a meeting where the consultant was supposed to withdraw his accusations things got completely out of hand. The nurse was severely abused and taunted. A short while after the meeting she had to take sick leave because of a mental breakdown. In this period she also learned that other people outside the hospital, including a doctor whose children were in the same daycare facility as her own, had heard about the conflict from the opposing party. A psychiatric specialist made the diagnosis of adjustment reaction.

The Committee did not agree with the medical specialist that the symptoms were consistent with an adjustment reaction. The Committee found, however, that the nurse had an unspecified stress disorder and that this disease was likely, beyond reasonable doubt, to have developed due to her work as a nurse. In the workplace she had been exposed to frequent, severe bullying and harassment for a long period of time from a medical superior and colleagues.

Recognition of aggravation of pre-existing post-traumatic stress disorder (prison officer exposed to accusations of leaking confidential information to inmates)

After well over 1 year's work in a prison, a 41-year-old female prison officer was summoned to an official interview where she was accused of having leaked information to an inmate. Colleagues had informed management that they had seen an inmate standing behind her, reading on her PC monitor. She was furthermore accused of having shown some papers to an inmate. A colleague had also heard an inmate say about another inmate that he would know more, once the female prison officer came to work the next day. She was furthermore accused, after a violent incident, of having visited an inmate in a section where she did not work, and of having stayed there for 10 minutes. She was later sought out by two police officers who questioned her about accusations that she had passed confidential information to inmates, including information on when there would be searches in the prison, thus giving them the time to hide forbidden things. However, the head of police decided to suspend the case as there was no reasonable assumption that any criminal offence had been committed. The woman had previously developed a post-traumatic stress disorder as a consequence of an incident of serious threats from an inmate. This incident had already been recognised as an accident at work. In connection with the accusations in the workplace her symptoms reappeared, including anxiety attacks, nightmares and flashbacks, avoidance symptoms, lack of energy, vigilance, isolation tendency and sleep problems as well as concentration problems.

The Committee found it likely beyond reasonable doubt that the prison officer had suffered a substantial aggravation of her previous post-traumatic stress disorder as a consequence of her work. The Committee took into consideration that she had been exposed to events of a mentally stressful nature, having been accused of passing confidential information to prison inmates, and having undergone a stressful process with an official interview and interrogation by the police, with the final result that the investigation was given up as groundless.

Recognition of unspecified stress reaction and depressive single episode (foster mother exposed to severe threats from adolescent boy with DAMP disorder)

A woman worked as a foster mother for 13 years. The last 6 years she was foster mother to a boy who had been diagnosed with DAMP disorder. He developed increasingly character-deviating features while living with her, and after his 13th birthday he began to show an increasingly threatening attitude towards his surroundings and her in particular. Among other things, he threatened to cut her open, to kill her, and to have her beaten up by bullies. She contacted the boy's home municipality, who arranged for a psychiatric examination. The examination showed that the boy had severely character-deviating features and exhibited a threatening and dangerous behaviour. The medical advice was to terminate the foster care contract and commit the boy to a treating institution. The municipal authority refused this, however, and subsequently the boy's threats and behaviour became worse and worse. He began to grab hold of her and keep a firm grip, not actually being violent. In the end the situation got so much out of hand that she had to interrupt the foster care relationship. Subsequently she was not in contact with the boy, but was exposed to threats and similar incidents on the phone, and these threats could only have been made by the boy. In the course of the foster care relationship she developed anxiety, tension, isolation tendency, irritability, concentration problems, and signs of depression.

The Committee found that the condition was consistent with depressive single episode and unspecified stress reaction and that it was likely beyond reasonable doubt that the disease had come about as a consequence of the work as a foster mother. The Committee took into consideration that for a 6-year period she had been exposed to severe threats and barrier-

breaking behaviour from an adolescent boy who had been diagnosed with DAMP disorder and had severe character deviation.

Recognition of ulnar neuropathy at the elbow (assembly operator working with pliers affecting elbow nerves)

A 49-year-old woman worked for about 4 months as an assembly operator in a cooler factory. Her work consisted in assembling coolers. In order to assemble the cooler she had to squeeze a pair of pliers very hard, with her right hand, round some clams. She made approximately 100 squeezing manoeuvres per hour. The employer largely verified the information. After about a month she developed pain and tension in her right elbow, and later her right hand and fingers, which became tender and swollen. A medical specialist made the diagnosis of ulnar neuropathy at the right elbow bone.

The Committee found it likely beyond reasonable doubt that the neuropathy at the right elbow bone had come about as a consequence of the work as an assembly operator. In the performance of this work she had to squeeze hard with a pair of pliers in her right hand, approximately 100 times an hour. The reason was that the described work affected the nerve of the elbow bone in a way and to an extent that significantly increased the risk of developing an inflammatory condition of the nerve.

Recognition of inflammatory condition and lesion of the meniscus discs between the carpal bones of the wrist (metal work with drilling machine etc.)

A 31-year-old man worked for 3 years as a metal worker in a machine factory. The work was varied metal work with repair and manufacture of equipment for slaughterhouses. In connection with the work he used many different tools, including a drilling machine for making holes in stainless-steel plates. The steel plates would suddenly get stuck, causing severe recoil affecting his right hand in particular. The metal worker also had to fixate a pipe with a steel brick while a colleague was hitting hard on the steel in order to adjust the pipe. He would be doing this kind of work for long periods of time. In connection with straightening pipes for a long time, the metal worker developed a deep pain in his right wrist region. An MR scan showed a lesion of the meniscus discs between the carpal bones of the wrist (discus triangularis), and an operation showed a degenerative lesion of the discs with an inflammatory condition.

The Committee found it likely beyond reasonable doubt that the lesion of the meniscus discs between the carpal bones of the wrist and the inflammatory condition had come about as a consequence of the metal work. He had been exposed to numerous micro traumas to the wrist during the work of straightening pipes and also to significant stresses in connection with the work at the drilling machine, which had a severe recoiling effect when it got stuck.

Recognition of bilateral inflammatory condition of the thumb (tendinitis) (social worker working with stomach tube feeding)

A 52-year-old female social worker worked for 5 years in a specialised children's home for very care-demanding, brain-damaged and multi-disabled children. She was in charge of the care of two children who needed to receive all fluids and food via stomach tubes – three times each per shift. It took approximately an hour to give a child a main meal, and she effectively administered tube feeding approximately 5 hours a day. Stomach tube feeding was done in the way that she pressed down a squirt piston with her right thumb held in an awkward posture. The piston was then completely pressed down. In the course of an hour she pressed the piston approximately 40 times. When she began to get symptoms in her right

hand, she changed to her left hand, subsequently getting symptoms and pain in her left hand as well. A medical specialist made the diagnosis of bilateral thumb tendinitis. The employer verified the work description, but thought there were many breaks in the course of the 5 hours of stomach tube feeding and that the work was not as strenuous as described by herself.

The Committee found it likely beyond reasonable doubt that, overall, the bilateral inflammatory condition of the thumbs (tendinitis) had been caused by stomach-tube feeding. The reason was that the work involved pressing with the thumbs for some time, strenuousness and brief intervals, as well as awkward working postures for the thumbs, which significantly increased the risk of developing thumb tendinitis.

Recognition of chronically irritated mucous membranes of nose and sinuses and perforation of the nasal septum (process operator with exposure to dust from minerals and vitamins)
A 55-year-old man worked for well over 12 years as a process operator in a business manufacturing mixtures of vitamins and minerals as additives for foods. For a very long period of time, his work consisted in weighing out raw materials. Despite exhaustion and mechanical ventilation he was unable to avoid dust exposure from citric acid, foline acid, carbonate, calium iodate, etc. After some time he developed dryness and irritation of the nose, which he typically felt during the weighing work. A medical specialist found that he had perforated the nasal septum and developed chronically irritated mucous membranes of nose and sinuses.

The Committee found it likely beyond reasonable doubt that the process operator had developed chronically irritated mucous membranes and sinuses of the nose as a consequence of the work, having been exposed to dust from various minerals and vitamins.

Recognition of asthma (welder with exposure to welding fumes)
A 33-year-old man worked for 2 years in a steel factory. His work consisted in welding steel constructions for the building sector, and he worked in a big hall with approximately 12 welders. There was no exhaustion and only a single ventilator, which did not work. The welding was CO2 black-steel welding, and there was severe heat generation and fumes – often so much that it was impossible to see from one end of the hall to the other. The Working Environment Authority had done an inspection of the factory and had found problems with the exhaust system. There were respirator protection masks, but air-filtrating respirators were not sufficient protection in connection with welding work. However, it also appeared that on the day of the inspection there were only four welders working in the hall instead of 12. After one year the welder began to develop an increasingly dry, irritative cough and wheezing breathing. He was allergy tested and was diagnosed with severe hypersensitivity to birch pollen, grass pollen and dust mites. He was subsequently diagnosed with professional bronchial asthma.

The Committee found it likely beyond reasonable doubt that, due to exposure to welding fumes, the welder had developed a substantial aggravation of a private, pre-existing asthma. It was included in the assessment that severe welding fumes can trigger asthma in an already sensibilitized person who has a private disposition for developing asthma.

When determining the compensation for permanent injury and loss of earning capacity the National Board of Industrial Injuries may make deductions in the compensation to the ex-

tent that the private disposition for asthma can be deemed to be a contributory cause of part of the asthma disease.

Recognition of skin cancer (auxiliary nurse with exposure to X-rays)

A 65-year-old woman had for more than 30 years worked as an auxiliary nurse in X-rays in a hospital. For more than half of the working day she was present in the examination room during the X-ray sessions and nearly every day helped fixating patients on the couch during the exposures. She wore a lead apron for X-ray protection, but her hands were always unprotected. A couple of years after leaving the job she developed skin cancer, of the squamous cell carcinoma type, on the 3rd and 4th fingers of her right hand. She later had both fingers amputated. She was subsequently diagnosed with localised spreading of the tumour to other fingers and to one heel, as well as the cervix and possibly the lungs. An expert assessment by a medical consultant and head of research of the Danish Cancer Society found that it was likely beyond reasonable doubt that the skin cancer had been caused by the many years of exposure to a large dose of X-rays.

The Committee found it likely beyond reasonable doubt that the skin cancer of the fingers of the right hand had developed as a consequence of the work. The reason was significant exposure to X-rays every day and for many years, which substantially increases the risk of developing skin cancer. It was also taken into consideration that the disease primarily developed on her hands, which were unprotected while exposed to radiation.

According to practice in the field, the other prevalences of cancer will be deemed to be a consequence of the recognised skin cancer (the primary cancer) to the extent that it is documented that the other cancer prevalences are caused by the recognised skin cancer (i.e. are secondary types of cancer through spreading of cells). Therefore the secondary cancers may be included in the calculation of compensation made by the National Board of Industrial Injuries.

Claim turned down – breast cancer (hairdresser with exposure to chemical substances and vapours)

A 46-year-old woman had worked as a hairdresser for almost 30 years. For about 50 per cent of the time, the work had consisted in cutting hair. For the remaining 50 per cent of the time she had tasks such as washing of hair, dyeing, highlighting and perms, for which she used a variety of hairdresser's chemicals. Only in later years did she wear gloves during this work. Towards the end of the period she was diagnosed with cancer of her right breast with spreading to lymph nodes. She underwent an operation and had the cancer tumour and the lymph nodes removed and subsequently had radiotherapy and chemotherapy as well as anti-estrogen treatment. She has not had a relapse for 3 years, but still needs checkups. In connection with processing the claim, the National Board of Industrial Injuries obtained an expert assessment from a medical consultant and head of research in the Danish Cancer Society regarding the general documentation of causality in the field, as well as a concrete assessment of the case in question. The expert assessment concluded that there is not at present any knowledge of substances or products in the hairdresser's trade which scientifically can be associated with breast cancer. The disease can furthermore have a number of other causes which are not work-related – including hormonal factors, heredity, and lifestyle and environment. The most recent survey results in the field indicate that there can be a slightly to moderately increased risk of developing breast cancer after work as a hairdresser, in particular after more than 10 years' work in the trade. The results are not unambiguous, however, and it is not yet possible to point to any concrete cause

mechanisms with regard to specific substances etc. in the trade. Against this background the expert assessment found it likely beyond reasonable doubt that the disease had been caused by factors other than work.

The Committee did not find it likely beyond reasonable doubt that the breast cancer had been caused by the many years' work as a hairdresser. The reason was that the disease might have many different causes not connected with the working environment and that it cannot be assumed, at present, that the hairdresser had suffered exposures as a hairdresser that substantially increase the risk of developing breast cancer.

In the summer of 2007, the National Board of Industrial Injuries, in consultation with the Occupational Diseases Committee, commissioned a new review of possible correlations between hairdresser's work and different types of cancer – including breast cancer. The review was advertised by the Working Environment Research Fund and is expected to become available in the second half of 2008. Therefore, on 1st December 2008, when the result of the review becomes available, the case in question will be reconsidered with a view to a new assessment.

At meetings in August and September 2007, the Occupational Diseases Committee discussed a total of 14 cases regarding different types of cancer in hairdressers – including breast cancer, cervical cancer, skin cancer and brain cancer. It was recommended to turn down all the claims and reconsider them once the review becomes available. The cases will then be reassessed.

<u>Claim turned down – rotator cuff syndrome of both shoulders with reassessment in 2008 (electrics fitter in a windmill factory)</u>

A 48-year-old man worked for a 6-year period as an electrics fitter in a windmill factory. His work mainly consisted in fitting components on a board. The components weighed from a few grammes up to some kilos. In addition he fitted transformers which sometimes weighed up to 20 kilos. He was able to use a lift for fitting of the heaviest units, but it could sometimes be difficult to get to them. Even though the fitting work was not particularly strenuous, there might occur tightening of bolts involving some exertion. Part of the work was also done with the arms lifted to about shoulder height. Altogether he built up boards for about 50 per cent of the working time. This work was performed about half of the time with arms lifted to about shoulder height. This is equivalent to a total of 25 per cent of the total working time. In later years the share of shoulder-loading work was reduced due to better options of adjusting the height of the boards. In the last couple of years the loads were reduced to a minimum. The electrics fitter already after a couple of years' work began to get stress-related pain in his right shoulder, and after a year also in his left shoulder. After some years he also had reduced motion of the shoulders. A medical specialist of occupational health made the diagnosis of bilateral rotator cuff syndrome.

The Committee did not find it likely beyond reasonable doubt that the work as an electrics fitter for 6 years had caused the bilateral rotator cuff syndrome. The reason was that the electrics fitter had worked with the arms lifted to about shoulder height only for about 25 per cent of the working time, and that the shoulder loads as a total could not be deemed to significantly increase the risk of developing rotator cuff syndrome.

In consultation with the Occupational Diseases Committee, the National Board of Industrial Injuries is planning a reassessment of the case on 1st April 2008. This is due to a future

review of shoulder diseases, which may give grounds for a different decision. The review, which examines the most recent research on shoulder diseases, will be discussed at a Committee meeting in March 2008, whereupon the case will be reassessed.

8. The development in the field of occupational diseases after the reform

8.1. The number of reported claims after the reform has exploded

Before the reform took effect in 2005, the number of reported claims was typically about 12-13,000. In 2006 there were approximately 18,500 reported claims of occupational diseases, and the trend for 2007 so far resembles 2006.

This means that we receive approximately 5,000-6,000 more reported claims per year compared to before the reform. This is equivalent to an increase of almost 50 per cent.

The increased number of reported claims can i.a. be explained in that the reform in general has enhanced the awareness of the possibilities of recognition of occupational diseases, and that the campaigns of the National Board of Industrial Injuries to get the doctors to report presumed work-related diseases in accordance with the rules have been successful.

8.2. The objectives of the workers' compensation reform are met

In the preliminary work for the workers' compensation reform in 2003, it was estimated that the reform would probably lead to approximately 1,000 more recognised occupational diseases per year. This is equivalent to an increase from about 2,500 recognised claims per year in 2002 to about 3,500 recognised claims per year from 2005 and onwards.

The objective applies to diseases reported on or after 1st January 2005, when the new conditions for recognition on the basis of the new list took effect.

The Board's report on injury year 2005 shows that, in comparison with the years before 2005, the reform objective of approximately 1,000 more recognised claims per year has been met.

Occupational diseases, distributed on decision, including internal lock-ups, injury years 2002-2007 (10th December 2007)

	2002	2003	2004	2005	2006	2007
Recognised claims	2,523	2,459	2,430	3,339	2,862	1,119
Turned down	9,614	9,477	10,657	12,473	13,490	7,812
Shelved without recognition	407	635	1,052	839	939	651
Others	9	12	26	220	1,310	7,800
Total	12,553	12,583	14,165	16,871	18,601	17,382

There are still a little more than 200 claims missing from 2005. These appear from the category ”Others”. A large number of these claims will qualify for recognition, but are underway a bit longer than other claims. This is because they await further medical and social information before it is possible to make a comprehensive decision on recognition, permanent injury and loss of earning capacity.

It is yet too early to determine the effect of the reform for injury years 2006 and 2007 as there still are a number of claims pending from these years. However, the trend does look the same as for 2005.

Against this background the Board expects the objective of 1,000 more recognised claims per year to be reached in the future.

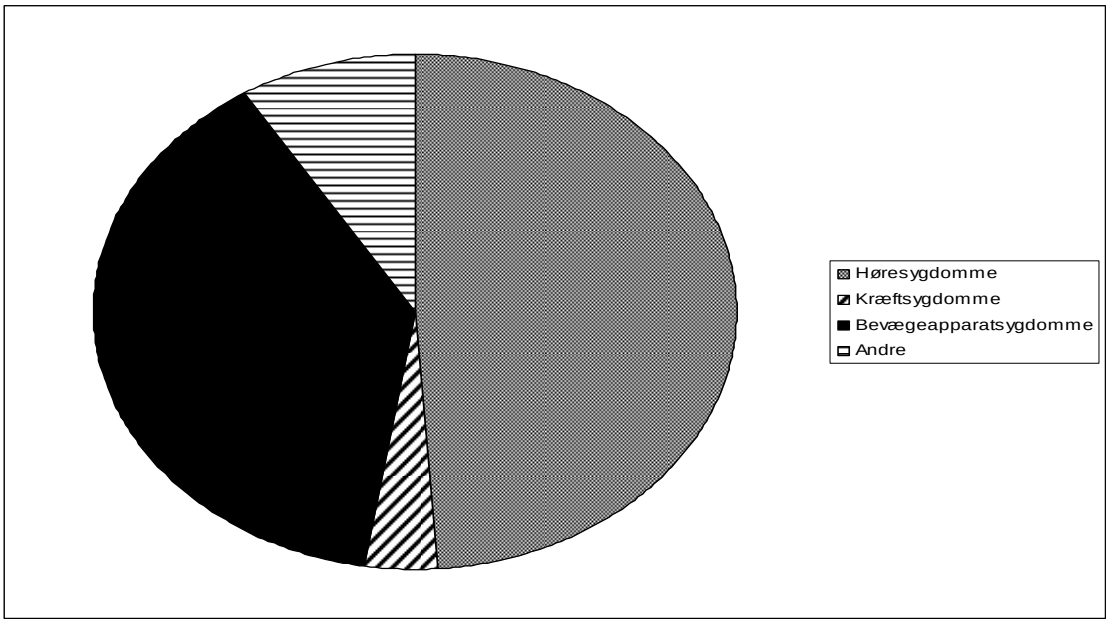
8.3. More recognised claims in special reform areas

If we take a look at the individual disease areas, there is a clear picture that, in particular for disease areas where the reform leads to less strict and broader rules, we see large increases in the number of recognised claims.

This pertains in particular to the following areas (numbers in parenthesis = increase in number of recognised claims from 2002 to 2005):

- Hearing diseases (104 per cent)
- Lung diseases (i.a. pleural plaques after asbestos) (140 per cent)
- Cancer diseases (25 per cent)
- Shoulder diseases (154 per cent)
- Elbow diseases (122 per cent)
- Forearm diseases (186 per cent)
- Nerve diseases (carpal tunnel syndrome) (64 per cent)

Increase in recognised claims from 2002 to 2005 distributed on selected disease areas (absolute numbers, 822 claims, 12th December 2007)



Hearing diseases
Cancer diseases
Musculoskeletal diseases
Others

As shown in the illustration above, the largest increase in recognised claims in absolute numbers has occurred in the field of hearing diseases, which represent a little less than half of the increase (404 claims), closely followed by diseases of the musculoskeletal system, which constitute 40 per cent of the increase (318 claims). Then follow other diseases, including lung diseases such as pleural plaques (73 claims) and cancer diseases (28 claims).

Overall, the development shows that the reform work of enhancing the chances of recognition of musculoskeletal diseases is moving in the right direction. This applies in particular to overuse of the upper musculoskeletal system (hand, arm and shoulder). The number of recognised claims in these areas is considerably larger than before the reform, and this corresponds well with the fact that the rules have become much less strict.

The now easier requirements for the musculoskeletal system are based on a thorough examination, during the reform work, of the most recent literature on the possible causalities, as well as gathering of new reviews of the evidence in selected fields. It is the opinion of the National Board of Industrial Injuries and the Committee that the requirements to the musculoskeletal system have been eased so far, where it is possible, on the basis of the requirements of the Act to medical documentation. There is, however, continued focus on the musculoskeletal system, and several new reviews of the subject are underway. These may contribute further to

the positive development. Furthermore a special effort is made in the field of cleaning and care work in order to examine the possibilities of recognising more musculoskeletal system diseases in these fields (see chapter 6).

In the field of cancer, which was very much broadened with the addition of new diseases and exposures to the list in 2005, and where, in the last couple of years, there were many activities in order to ensure more reported claims regarding work-related cancer, we are seeing a significant increase, in the number of recognised claims, of approximately 25 per cent.

This figure is expected to increase even more after the Workers' Compensation Act was changed with effect from 1st July 2007. Now a new register in the National Board of Health ensures automatic notification of pulmonary and peritoneal cancer (mesothelioma) and cancer of the nasal cavity and sinuses to the National Board of Industrial Injuries. This happens in order to ensure that persons with these two types of cancer, which are very often either due to asbestos exposures in the workplace (pulmonary cancer) or exposure to wood dust (cancer of the nasal cavity and sinuses) get the compensation to which they are entitled.

The preliminary results of the Act amendment do also show that, from 1st July 2007, considerably more claims were reported regarding mesothelioma and cancer of the nasal and sinus cavity than before the Act took effect.

In the past few years, before 1st July 2007, the National Board of Industrial Injuries registered approximately 18-23 reported claims per quarter of the two diseases added together, of which mesothelioma and pulmonary cancer represent well over 90 per cent.

In the 3rd quarter of 2007 the number of new reported claims increased to a total of 88 claims, and in the 4th quarter of 2007 39 new claims were registered. Of these, between half and one third come from the National Board of Health. This indicates that there is at the same time more focus on the disease among cancer treating doctors as there has also been an increase in the number of reported claims from them.

Finally the numbers also reflect a success story in the working environment as the number of claims regarding solvent poisoning show a decrease of almost 50 per cent from 2002 to 2007 and are about 0. These were previously generally prevalent in i.a. the painter occupation and the printing trade. Very likely this decrease is due to improved safety procedures in connection with solvents and the fact that many products have been replaced by other and less hazardous products.

For more detailed information on reported claims and decisions on claims pertaining to occupational diseases in 2007, we refer to the annual statistics of the National Board of Industrial Injuries, which were published at the beginning of 2008 and can be seen on our website www.ask.dk

9. Principal meetings in 2008

The Committee has so far planned a number of principal meetings for discussion of a number of new reviews which have already been received or will be coming in the course of 2008.

The meeting schedule is very provisional so far. The exact dates for handing in the reviews to be discussed at meetings in the second half of 2008 have not yet been decided.

Apart from the new reviews, the Committee will also discuss a number of cleaning and care cases as part of the special effort to be made in this field. This is expected to happen at two meetings in 2008.

Scheduled principal meetings of the Occupational Diseases Committee 2008

Date of meeting	**Theme to be discussed**
29th January 2008	Review of stress and heart disease
26th February 2008	Review of stress and mental disorders
25th March 2008	Review of shoulder diseases
27th May 2008	Cleaning and care work (special effort)
30th September 2008	Review of hairdresser's work and cancer Cleaning and care work continued (special effort)
28th October 2008	Review of jumper's knee
25th November 2008	Review of degenerative diseases of the cervical spine Annual report 2008 to the Parliamentary Labour Market Committee
16th December 2008	Review of night-shift work and heart diseases Annual report 2008 to the Parliamentary Labour Market Committee