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ALBERTA OCCUPATIONAL MEDICINE NEWSLETTER

EDITORIAL COMMENTS

Season's greetings to all medical personnel and other readers of the Newsletter! Reflecting back on 1984, The Newsletter has attempted to diversify and broaden the scope of subject matter presented to the reader. From the comments so far received personally or by mail, the change has been appreciated by most. It is our intention to continue presenting diverse subject matter, reviews, case presentations of interest to the practitioner of occupational medicine whether in private, general or corporate practice, and for those with a research based interest and academic sway. We would sincerely like to thank all authors who graciously contributed material for 1984, and look forward to their further contributions in 1985. We would invite our readers to comment, criticize and make requests for reviews at any time, by correspondence with the editor. As well, an invitation is extended to all persons with an interest in occupational health to correspond with the editor, if he or she wishes to write an article or review for the Newsletter.

It has been our practice not to include long lists of references for each article (due to limitations of space), but these are available for those who wish to pursue a subject in more detail. It is my assumption that in a brief 2 page newsletter, subject matter (the ''main course'') should take precedence over the references (''The late night snack'') - I am assuming that most readers will agree.

This issue of the Newsletter brings to a close Volume II. We have included articles from Dr. Bob Orford, Occupational Health and Safety, and Dr. Ron Dufresne, W.C.B., Alberta. Dr. Dufresne and W.C.B. have graciously volunteered to submit regular topical reviews over the next several issues. Dr. Dave Chisholm has submitted a followup to a previous article on hair analysis. Dr. Kirk Barber has contributed a dermatological consultation on chrome sensitivity in workers, and Dr. Jeff Mellor has graciously contributed a personal perspective on TB in workers.

We look forward to your comments and correspondence in 1985. Once again, season's greetings, and see you in the Spring with a new volume and issue of the Newsletter.

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W.M. Csokonay, MD, CCFP(c),
DTM&H (Lond)
Dept. of Community Health Sciences
Faculty of Medicine, University of Calgary

OCCUPATIONAL HEALTH & SAFETY IN ALBERTA

R.R. Orford, M.D., FRCP(C)
Executive Director,
Occupational Health Services
Alberta Workers' Health,
Safety & Compensation,
Occupational Health Division

Alberta has a population of approximately two million, including over eight hundred thousand workers. The major industries in the province are agriculture, construction, oil well drilling and servicing, forestry, mining and manufacturing.

The Government role in occupational health & safety in the Province began in the 1940s with the creation of the Accident Prevention Branch of the Workers' Compensation Board. In 1964, the Division of Industrial Health Services was created with the Department of Health. In 1976 these two organizations were united under the Department of Labour as the Occupational Health & Safety Division. With the Provincial election of 1979, responsibility for both the Occupational Health & Safety Division and the Workers' Compensation Board was transferred from the Minister of Labour to the Minister responsible for Workers' Health, Safety & Compensation. The Division and the Board are administratively separate entities, with the Division being concerned primarily with prevention while the Board is responsible for compensation of workers and the financial assessment of employers to cover the costs of compensation claims.

The Occupational Health & Safety Division includes two Services (Work Site Services and Occupational Health Services), each with four Branches, and two additional Branches, Research & Education and Administrative Services which report directly to the Managing Director. The largest section of the organization is **Work Site Services.** This Service is responsible for the development of safety standards and regulations in addition to inspection and enforcement of the regulations. Two **Inspection Branches (North and South)** operate out of regional offices in Edmonton, Calgary and a number of smaller centres in the Province. Occupational Health & Safety Officers (OHSOs) investigate fatal and non-fatal accidents in addition to carrying out inspection activities. Work Site Services also includes a **Mines Inspection Branch** responsible for safety issues in mining and quarrying, and an **Operational Support Branch** which maintains a sophisticated data base on worksite inspection activities and priorities, and coordinates planning and budgeting within the Service.

The **Research & Education Branch** provides educational programs for workers and supervisors, manages the library, which includes a substantial collection of books, periodicals and films, and carries out some research into occupational health & safety issues, particularly those involving the analysis of statistics from the Workers' Compensation Board master file. Research & education also coordinates with other Branches in establishing and developing programs for occupational health & safety professionals and manages the Occupational Health & Safety Grants Program, a ten million dollar, eight-year research fund established in 1981 to support research and education on occupational health & safety issues.

Occupational Health Services is the Service within the organization concerned with the prevention of occupational disease, disability and the promotion of occupational health. The staff complement is seventy, in four Branches: Laboratory Services, Medical Services, Radiation Health & Occupational Hygiene.

Occupational Hygiene is the largest Branch, with responsibility for environmental monitoring and control of the work place. Operating out of two regional offices in Edmonton and Calgary, hygienists and hygiene technologists carry out approximately one thousand hygiene investigations each year resulting from requests from Occupational Health & Safety Officers, workers and employers. Engineering staff review in excess of thirteen hundred ventilation plans per year to determine their compliance with occupational health regulations.

Head office staff are engaged in the development of regulations such as those promulgated respecting noise in August, 1981 and vinyl chloride monomer, asbestos, silica and chemical hazards in March, 1982. In addition, Branch staff carry out a number of special investigations each year which have included, for example, studies of health hazards in metal foundries and of occupational exposure to anaesthetic gases in hospitals in the Province. Finally, the Branch has been responsible for producing a number of publications, including **Health & Safety in Printmaking** (1978), **Design Criteria for the Control of Health Hazards in Schools** (1980) and **Asbestos Control -Sprayed on Applications** (1981).

The **Radiation Health Branch** is the only Branch with public as well as worker responsibility. The purpose of the Branch is to prevent injury from ill-health and genetic damage in workers and the general public resulting from exposure to ionizing and non-ionizing radiation. Acting in conjunction with inspectors of the Atomic Energy Control Board located in Calgary, Branch staff are responsible for the licens-

ing of users of radioactive materials and compliance inspections. The Branch is also responsible for the licensing of industrial radiographers and medical x-ray facilities. A non-ionizing radiation protection program was initiated two years ago. The manager of this program has surveyed many video display terminals, microwave facilities, suntanning parlours (U.V. light) and lasers, and has prepared information packages respecting V.D.T.s and suntanning parlours.

As opposed to the Occupational Hygiene and Radiation Health Branch staff, who are concerned with the assessment and control of occupational health and radiation hazards in the workplace, and the Occupational Health and Safety Officers who are primarily concerned with the assessment and control of physical hazards in the workplace, the **Medical Services Branch** deals with the effects of these hazards on the worker. It is therefore involved in the investigation of medical aspects of industrial accidents and illnesses. There are two large ongoing medical programs required by regulations. The first is the **Fibrosis Program**, under which pulmonary function tests and chest x-rays have been required on dust-exposed workers, every two years, since 1971. Approximately sixteen thousand records are now on file and one thousand new records are added each year. The second major program is **Hearing Conservation**. A hearing conservation program, including use of personal protective equipment, posting of warning notices, etc., is required on Alberta work sites where noise levels exceed 85 DBA. Audiometry is required where noise levels exceed 90 DBA. Medical aspects of the program are managed by an audiologist within the Medical Services Branch who, in addition to administering the Noise Regulation, has trained approximately three hundred audiometric technicians in the province over the past five years. Branch staff also carry out detailed medical surveys when specific problem areas are identified. For example, recent surveys have been carried out respecting brucellosis among meat packers and respiratory problems among workers exposed to tri-mellitic anhydride, a pipe-coating compound. The Branch has also produced a number of reports and publications, including **Noise in the Workplace,** (1980), **Medical Confidentiality of Occupational Health Records** (1981), **Coal Mining in Alberta - An Occupational Health Study** (1981) and **The Prevention of Industrial Eye Injuries** (1982).

The **Laboratory Services Branch** provides chemical, bio-chemical and radio-chemical analyses, calibration facilities and professional advice on chemical aspects of occupational health to people working in the field of occupational health in Alberta. It acts primarily as a support branch for investigations carried out by the other three Branches within Occupational Health Services but also provides services to occupational health professionals in industry following consultation with one of the three OHS Branches. It is one of three laboratories in Canada accredited by the American Industrial Health Association. At the present time, the laboratory analyses over four thousand biological and three thousand environmental samples per year.

Outside the Occupational Health & Safety Division, interest in Occupational Health and Safety issues is high. The Alberta Association of Industrial Safety Councils brings together management and safety professionals from Safety Councils representing each of the major sectors of industry in the Province except Agriculture. Professional organizations include the Alberta Association of Safety Personnel, the Alberta Occupational Health Society and the Alberta Association of Occupational Health Nurses. Very recently, the creation of a professional association of occupational health physicians in the province, which will likely come under the auspices of the Alberta Medical Association, has been initiated.

With its strong industrial base and a government committed to a high level of support for occupational health and safety programs, Alberta is continuing the forward thrust initiated by the Industrial Health & Safety Commission (Gale Report) of 1975 and will maintain and develop more and better programs to prevent work-related accidents and ill-health in the province in the future.

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INTERPRETATION OF HAIR ANALYSIS

David M. Chisholm, M.D.
Occupational Health Centre
Shell Canada Resources Ltd., Calgary

The analysis of human hair for elements has received considerable attention in Alberta during the past one and a half years. The main use has been in two studies conducted by Earle Snider, PhD., as sponsored by the Department of Social Services and Community Health and the Energy Resources Conservation Board.

For scientific study and medical investigation, hair analysis is of limited but increasing value. At this time population comparisons for some heavy elements can be useful, but individual interpretation is much more restricted. From the United States in the last several years it has been medically promoted by a small number of physicians and other health professionals, and commercially expolited by some food stores, laboratories, and vitamin and mineral sales outlets.

Printouts of individual hair element analyses must be put into proper perspective and interpreted with care and caution. MineraLab is no exception. However, their scientific and laboratory tests used on hair have been appraised and are in general satisfactory.

Results interpretation is another matter.

Fact:1

There are no world-wide excepted standards of "normal" ranges for elements in hair at this time (MineraLab has arbitrarily chosen its own levels based upon its interpretation of the scientific literature).

Fact:2

For **biological monitoring** of human exposure to elements, hair analysis for methyl mercury (organic) is the only heavy metal accepted by the World Health Organization. A dose-response relationship has been established between whole body content and hair levels.

Fact:3

As a **screening procedure** to identify population groups for which there is some body accumulation of elements related to exposure, hair analysis has been generally accepted for:

- lead
- mercury (inorganic)
- arsenic

Individual interpretation is of some value especially where massive exposure is expected.

Fact:4

High hair cadmium is **not** necessarily an indicator of body burden or endogenous internal depositing in the hair, therefore it is most likely from exogenous or external depositing.

Fact:5

With the current state of knowledge, all other elements measured by MineraLab do not have an established dose-response relationship. Therefore, the relevance of their levels in hair to health status is uncertain.

The Occupational Health Centre staff can assist you in interpreting your results, and where indicated, advise you if any follow-up investigation or repeat testing is warranted.

ANNOUNCEMENT:

RESOURCES AVAILABLE TO MEDICAL PERSONNEL

1. **Medical Services Branch, Alberta Occupational Health and Safety.**

   Most health professionals in the province equate Alberta Occupational Health and Safety with enforcement of regulations. However, some have discovered that the Medical Services Branch can provide helpful advice in a variety of problems where illness and work are associated.

   Medical Services has consultant specialists in occupational medicine, occupational health nursing, occupational epidemiology, and occupational noise and hearing loss. If you've got a diagnostic dilemma, require information about a particular work process or the significance of some esoteric worksite substance to the health of your patient, information and advice are as close as your phone. The Branch also maintains a list of experienced and qualified occupational medicine consultants in private practice should you wish to refer your patients for examination or treatment.

   Medical Services Branch specialists can be reached at 427-4796 for the Northern Region Office in Edmonton and 297-2432 for the Southern Region Office in Calgary.

2. **The Calgary Occupational Health & Safety Library.**

   The Calgary Occupational Health & Safety Library is for use of Division staff and the public. Borrowing privileges are restricted to OHS staff members. However, materials can be loaned to other companies through a procedure called Inter-library Loans. These can be arranged when you come into the library. Copying of material (within reason) is done for no charge.

   The OHS collection includes journals, monographs, KWOC files (pamphlets, articles, etc.), annual reports, a film library and more. Literature searches are done free on the data bases CIS (Canadian Centre for Occupational Health & Safety) and NIOSHTIC. These data bases cover topics on all aspects of occupational health & safety on a worldwide basis.

   The library is open from 8:00 to 11:45, Monday to Friday. If you would like more information please call Kim Polvi at 297-7282 or visit the library located at 1021 10 Ave. S.W.

NOTICE BOARD — UPCOMING MEETINGS AND CONFERENCES

MARCH 1985

(1) Mini-Residency in Occupational Medicine for Physicians, March 18-22, 1985.

Sponsor: University of Cincinnati College of Medicine.

Contact: Sidney Lerner, M.C. University of Cincinnati College of Medicine Mail Location 182, Cincinnati, Ohio 45267 U.S.A.

(2) Update in Occupation Medicine, University of Calgary, March 29, 1985

Contact: Dr. E. Love, Department of Community Health Sciences, University of Calgary.

APRIL 1985

(1) International Symposium: Biological Monitoring of Exposure to Metals and Inorganic Compounds — April 29-May 2, 1985

Sponsor: University of Alabama in Birmingham.

THORACIC OUTLET SYNDROME — ETIOLOGY AND PATHOGENISIS — "STATE OF THE ART"

Literature Review and Personal Communication: —
W.C.B. Alberta, Medical Department, 1984
Submitted by Ronald M. Dufresne, M.D., DIH (Eng.), CSPQ, DAB Prev. Med. (Occ. Med.), FACPM
Director of Medical Services, WCB, Alberta

Definition

A variety of abnormalities have been recognized which constrict or compress the brachial plexus, the subclavian artery or the subclavian vein, near the first rib and clavicle. Onset of symptoms is usually at 20-40 years of age.

Several descriptive terms have been employed to indicate the causative mechanism thought to be present. These include Thoracic Outlet Syndrome, Cervical Rib, Scalenus Anticus Syndrome, Costo-clavicular Syndrome and Hyperabduction Syndrome.

Signs and Symptoms and Differential Diagnosis

The patient is often seen by several physicians before compression at the thoracic outlet is suspected.

Regardless of cause, the disability depends on the structure(s) being compressed. These relate to:—

Neurological (paresthesia, pain and/or weakness)	90%
Tenderness in the supraclavicular area with duplication of symptoms with abduction and external rotation of the arm	95%
Arterial and/or venous insufficiency	5%-10%

There are usually no "hard" neurological findings. There is poor localization of pain, and nerve conduction studies are seldom of much value.

Other problems which may be confused with T.O.S. include:

- Cervical disc disease
- Cervical osteoarthritis
- Carpal Tunnel Syndrome
- Biceps - or supraspinatus tendonitis
- Shoulder sprains
- Spinal cord tumors
- Apical lung disease

Etiology and Pathogenesis

One of the reasons why T.O.S. appears to be complicated is the fact that there is no single cause/effect mechanism leading to the development of the syndrome. Developmental, degenerative, soft tissue hypertrophy and traumatic events may all play a part.

Developmental

Abnormal development of the first rib or clavicle are important as these structures form part of the boundaries of the thoracic outlet. Cervical ribs should also be considered, but their significance may have been over-estimated in the past. Cervical ribs are present in approximately 0.5% of the general population and various studies indicate that only about 10% of these ever give rise to symptoms. Congenital neck bands (possibly resembling scar tissue at the time of surgical exploration) may represent incompletely developed cervical ribs and cause restriction.

Abnormal development, width or insertion of the scalenus anticus and medius muscles include soft tissue abnormalities which may be present.

Finally the thin individual with a long narrow neck, (the latter physiognomy appears to be more common in females) may be particularly predisposed to developing T.O.S.

Degenerative

In degenerative muscle conditions, aging or poor general muscle tone involving the shoulder musculature, there may be "dropping" of the shoulder girdle leading to impingement on the thoracic outlet.

Soft Tissue Hypertrophy

Soft tissue hypertrophy is another factor that should be considered. Unusually well developed musculature seems to predispose to compression. Vigorous muscular exercise may also increase muscle bulk and reduce the space available at the thoracic outlet. Because of generalized swelling due to fluid retention, pregnancy may be a contributing factor, although self-limiting.

Trauma

The relationship to trauma may be direct and dramatic. Direct trauma to the upper thorax or shoulder may result in thoracic outlet syndrome. Similarily fractures of the clavicle or first rib with mal-alignment or excessive callous formation may cause compression as will subacromial dislocation of the humeral head.

Hyperextension injuries of the cervical spine may tear the scalene muscles and subsequent healing, with scar tissue formation, may cause compression, weeks to several years later.

Finally, dynamic forces causing hyperabduction, downward movement of the shoulder girdle, or a hypermilitary position of the shoulders, will put tension on the vessels and/or nerves passing through the thoracic outlet.

SUMMARY

Thoracic Outlet Syndrome has a fairly large differential diagnosis and the onset may be spurious. Because of the multi-factorial etiology and lack of specific tests to confirm the diagnosis, many factors need to be considered. In addition to a thorough medical investigation, a detailed work history should be obtained before advising whether a relationship exists between an occupation and T.O.S.

(References available upon correspondence with editor).

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RASH STATEMENTS V
CHROME CRIPPLES

Case I

A 25-year-old concrete form setter experienced the onset of a red scaling and vesicular hand eczema while at work. His eczema improved on his holiday but promptly returned when he returned to work.

Patch testing revealed a strongly allergic reaction to potassium dichromate.

A job transfer was requested and he now works with asphalt. He denies further contact with cement. He continues to have recurring problems with his hand eczema but of a less severe nature.

Case II

A 45-year-old concrete finisher was referred with a 10 year history of hand eczema. He has worked in this trade since a young man and noted the development of hand eczema only in his later years. Examination revealed a fissured, hyperkeratotic palmar hand eczema.

Patch testing revealed a strongly allergic reaction to potassium dichromate.

Topical corticosteroid therapy has been only moderately effective in allowing this patient to continue working. He requires intermittent absences from work to allow his hands to heal so that he can continue. He feels he is too old to be retrained and will not leave his job.

Case III

A 60-year-old tile setter was referred by his family practitioner to an ophthalmologist. He was found to have anterior subcapsular cataracts which were felt to be due to long term corticosteroid use. He gave a 40 year history of recalcitrant hand eczema for which he had been receiving corticosteroids both topically and intramuscularly since those drugs were available.

Investigation of his hand eczema revealed a strongly allergic patch test reaction to potassium dichromate.

He has retired from the work force and his eczema is reasonably quiescent.

These three patients illustrate the problems with chromate (potassium dichromate) sensitivity. Chromates have many diversified industrial uses and in industrialized countries they are also the most common allergic sensitizers in man.

The chromate problems I see in this province are primarily in construction industry workers. The source of chromates is CEMENT. Allergic contact dermatitis to chromates is insiduous in onset and chronic in nature. The eczema is usually hyperkeratotic and fissured involving the palmar surfaces with a nummular (discoid) pattern over the dorsal aspect of the hands and on the forearms.

Topical corticosteroids and allergen avoidance are the cornerstones of therapy. Gloves and barrier creams are totally ineffective preventive measures. Ascorbic acid ointments and liquid "dips" applied to the skin have been partially effective in chelating and reducing chromates to prevent their cutaneous absorption. The addition of ferrous sulphate to cement during the manufacturing process reduces and precipitates the chromates. The practicality of this procedure is being considered by the manufacturers.

Chrome sensitivity carries an extremely poor prognosis. Sensitive individuals need only be exposed to minute quantities of chromate to trigger their eczema and many others seem to develop a chronic recalcitrant eczema despite the apparent removal of chromates from their environment. One investigator reports that only 8% of patients with chrome sensitivity from cement were free of dermatitis ten years after their initial eruption. In fact, many of these individuals become virtually unemployable — **the chrome cripples**.

(**DR. KIRK BARBER**, consultant dermatologist in Occupational and Environmental Health, Calgary).

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TUBERCULOSIS IN THE WORKPLACE

Dr. Jeffrey Mellor,
Director T.B. Clinic,
Foothills Hospital, Calgary

Tuberculosis is not a common problem in Alberta. The overall incidence is about 10 per 100,000 and about five or six in Calgary and Southern Alberta. Well recognized high risk groups, particularly native Indians, Asians and the elderly, are **disproportionately** represented and may account for more than 55% of cases. Thus, for large segments of the population, this disease is almost unheard of. The problem of tuberculosis in the workplace largely mirrors that in the community with one major exception. This exception involves health care workers whose potential exposure may extend to all population groups. The bulk of this article will examine tuberculosis risk in general terms for health care and non-health care workers, but as general principles of tuberculosis control are often forgotten, a brief review will be helpful.

There are two basic ways to find cases of tuberculosis. **Active case finding** with mass x-ray surveys was a fact of life in previous years when the incidence was much higher. The concept of "routine" chest x-rays seems to be dying a slow death and always needs to be preceeded by the question, "What are the chances of finding x-ray evidence of tuberculosis (or any other disease) in this otherwise healthy individual?" **If the chance is low, then the reason for doing the x-ray becomes doubtful.** Nowadays, we are a little more sophisticated in that we screen populations with mantoux skin tests rather than x-rays, but the same argument applies, and if we have solid epidemiologic support for a low incidence of tuberculosis, then consideration should be given for abandoning this also. A good example was found in our recent experience with Vietnamese refugees. In 1979 to 1980, as we began to appreciate a very high incidence of tuberculosis, in the order of up to 400 per 100,000 population, local health units undertook to skin test these refugees on arrival. Several unsuspected cases of active tuberculosis were found and hundreds more were given preventive treatment with Isoniazid because they had inactive tuberculosis or positive skin tests in the absence of BCG vaccination. In retrospect, this was a valuable program in a very high incidence group. On the other hand, routine skin test surveys of school children was conducted for many years but it finally became apparent that a lot of work was involved for little benefit. When it was found that the conversion rate between grades three and nine was less than 0.5%, this practice stopped.

Alternatively, **passive case findings** means that patients with suggestive symptoms are discovered by their physicians, and the community health nurse screens contacts with mantoux tests, and for positive reactors, with a chest x-ray. For the most part, with declining incidence this is the preferred and most cost-effective mode of case detection, but it does depend on alert and informed medical practicioners.

Let us see how these principles operate in the workplace. For the most part for non-health care workers, the risk of developing tuberculosis is extremely small and screening programs are of low yield. One could make a case for screening immigrants, but there are repeated concerns that this could be seen as discrimatory. To a certain extent the immigration department identifies individuals with old and inactive tuberculosis who have the highest risk for reactivation, but positive skin test reactors, with normal chest are not identified. On balance then, most occupational groups probably will not greatly benefit from screening. This is not to say that occasional cases of active tuberculosis will not develop in the workplace, but it is just not effective to screen whole populations for a relatively remote possibility. In 1983 a bank employee was found to have active tuberculosis and in retrospect had been symptomatic for several weeks. When all the known contacts were assessed, 20 new positive reactors were found in addition to four people with abnormal chest x-rays consistent with early tuberculosis. Such examples however are rare, and should not be used to support widespread screening of the work force. Spot surveys may be valuable if there is unexplained rise in the number of active cases in the community.

Let us consider the final group, that of health care workers. This group could include not only hospital and nursing home workers, but also police, paramedics, jail guards, social workers or any group with broad contact with the public, or segments of the public where tuberculosis may be found. At the beginning of employment, it is probably reasonable for individuals in this group to be screened for tuberculosis with a mantoux test and chest x-ray if positive. Follow-up of negative reactors would depend on the risk of exposure and the specific type of occupation. Being forwarned with an individual's mantoux status will decrease the anxiety at the time of exposure and allow more rational treatment if an individual is in contact. Fortunately most hospitals have infection control policies which are usually more than adequate. However other groups usually do not. Having said this, it is important to realize that tuberculosis is infrequent in this group, four cases only in the last six years in Southern Alberta. In only one of these cases was it likely that the individual, a physiotherapist, picked up her disease from a patient.

To summarize, tuberculosis is a low incidence disease except for the risk groups mentioned. Screening broad segments of the workforce is unprofitable in terms of detecting active tuberculosis in asymptomatic individuals. Such screening programs if contemplated should be undertaken only with the assistance of an expert in the field. In higher risk occupations, it is helpful for an individual to know his mantoux skin test status at the beginning of employment.

THE 10 LEADING WORK-RELATED DISEASES AND INJURIES, UNITED STATES OF AMERICA, 1982*

(Reprinted from W.H.O. Wkly Epidem. Rec.: 1983, 58, 69)

1. **Occupational lung diseases:** asbestosis, byssinosis, silicosis, coal workers' pneumoconiosis, lung cancer, occupational asthama
2. **Musculoskeletal injuries:** disorders of the back, trunk, upper extremity, neck, lower extremity; traumatically induced Raynaud's phenomenon
3. **Occupational cancers** (other than lung): leukaemia, mesothelioma; cancers of the bladder, nose and liver
4. **Amputations, fractures, eyeloss, lacerations,** and **traumatic deaths**
5. **Cardiovascular diseases:** hypertension, coronary artery disease, acute myocardial infarction
6. **Disorders of reproduction:** infertility, spontaneous abortion, teratogenesis
7. **Neurotoxic disorders:** peripheral neuropathy, toxic encephalitis, psychoses, extreme personality changes (exposure-related)
8. **Noise-induced loss of hearing**
9. **Dermatological conditions:** dermatoses, burns (scalding), chemical burns, contusions (abrasions)
10. **Psychological disorders:** neuroses, personality disorders, alcoholism, drug dependency

*The conditions listed under each category are to be viewed as selected examples, not comprehensive definitions of the category.

Three criteria were used to develop the list: the disease's or injury's frequency of occurence, its severity in the individual case, and its amenability to prevention. The list is suggested with 3 purposes: (1) to encourage deliberation and debate among professionals about the major problems in this field of public health, (2) to assist in setting national priorities for efforts to prevent health problems related to work, and (3) to convey to a diverse audience the concerns of the leadership of NIOSH and the focus of the Institute's activities.

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"ON A DIFFERENT NOTE"

(Editor's note: The following is reprinted with appreciation to Dr. W. B. Whiting, Medical Officer, State Compensation Insurance Fund, San Francisco, California — it appeared in a recent internal publication entitled **Whiting's Weekly Word**.)

The practice of medicine continually changes as does our society and our habits of living. This is particularly true in the specialty of occupational medicine. It has been the history of medicine that once a specialty is developed, subspecialties within that segment develop later on. Occupational medicine itself is considered a branch of preventive medicine, if you will. Now comes a beginning subspecialty in occupational medicine as described in a recent issue of the Journal of the American Medical Association — "MUSIC MEDICINE". It has begun with a hand full of physicians, many of whom play instruments themselves or have musical family members, and who are becoming aware of unique medical problems in the music world. Thus, music medicine is becoming a full-fledged entity akin to SPORTS MEDICINE.

In sports medicine, an injured star athlete can cost a lot of money. This is not necessarily so in the music production world. Actually, much of the public has a response to an injured musician of "if it hurts, give it up." For most serious professional musicians, however, changing jobs is only the last resort — similar to an olympic runner giving up sprinting, a clergyman giving up preaching, or a physician giving up doctoring.

According to a prominent violinist in the Chicago Symphony Orchestra, "many times people have said to me that music is fun. They don't understand that it's also work."

Musicians' physical difficulties fall into two categories — those caused by the playing and those caused away from the instrument that affect the performance. Common diagnoses include "over-use syndrome," tendonitis, tenosynovitis, and other inflammations, ulnar and other nerve entrapments, carpal tunnel syndrome, and cervical disc disease.

The spectrum of injury in musicians can be demonstrated by a listing of some of the syndromes that they develop such as: cymbal players' shoulder; horn players palsy; pianists, violinists' and harpists' cramp; english horn players' thumb; and even cellist' dermatitis.

Each type of instrument produces its own set of injuries. Increased intralaryngeal pressure, for example, may cause laryngoceles (dialation of the larynx and throat) in wind players. In fact, the double reed players such as oboists and bassoonists can generate such tremendous pressures in the oral cavity that a temporary palatal paralysis can prevent the closing off of the nasopharynx with the soft palate. Musicians call this "loosing their seal." The result is air escaping through the nose and inability to produce sound. Double reed players may develop severe headaches and even retinal hemorrhages.

The place that the musician sits in the orchestra can lead to problems. The unfortunate violinists who sit in front of the horn players can develop hearing problems. If the orchestra is playing on the stage, the lighting is usually excellent, however, if the orchestra is in the pit and an opera or show is on the stage, the lighting may be miserable leading to severe eye problems.

Poor sitting posture for a long time can lead to numerous problems. Psychological problems, such as stage fright, can result in psychosomatic symptoms.

Sometimes watching a patient play can help physicians spot the source of the damage. For example, one physician asked a patient to play her autoharp for him in his office. After about 15 minutes, she developed totally disabling cramps, soreness, and numbness in her left hand. She sat in such a fashion that she had to bend her arm awkwardly around the instrument and she was developing a vascular type of thoracic outlet syndrome. After the thoracic outlet syndrome was corrected by surgery, she returned to teaching and playing without pain.

Observation of the patient at work in this instance, led to the diagnosis as it will many times in other branches of occupational medicine.

[Editor's comment: Thanks to Dr. Guidotti, Dept. of Health Services, Administration and Community Medicine, University of Alberta for putting us on to this unusual item. Just when you thought you knew everything! . . . .]