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# TR-04-97

## Occupational Medicine For Policing

A. Trottier  
J. Brown

**TECHNICAL REPORT**  
**1995**

Submitted by:  
J. Brown  
Royal Canadian Mounted Police

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## POLICE OCCUPATIONAL HEALTH REVIEW

### Occupational medicine for policing

A. Trottier, J. Brown

Royal Canadian Mounted Police, Ottawa, Ontario, Canada

**SUMMARY.** A wide variety of medical conditions may be associated with police work. Unlike other occupations where a specific link can be traced between an exposure or an action and a specific pathology, the link between police work and disease is more problematic.

The medical conditions which seem to be associated with police work are all conditions for which numerous other risk factors are identifiable. These risk factors include physical inactivity, poor nutritional practices, cigarette smoking and alcohol overuse.

While it is undoubtedly desirable to minimise these risk factors in any patient population it is imperative, given the increased risks among police personnel, that aggressive attempts be undertaken to reduce cumulative risks.

The physician plays an important part in this process by screening for specific conditions associated with police work, by educating the police officer about increased risks and by encouraging lifestyle choices that will reduce risk. It is also important that the physician encourages the use of personal protective equipment where appropriate.

Periodic health assessment of police officers by a physician knowledgeable about police work should include education about the risks associated with the occupation and about methods to reduce risk. The physician should also enquire about exposures to violent or dangerous occurrences and should include assessment for possible emotional sequelae of such exposure.

Operational procedures designed to reduce risk of violence and to improve police officer safety and survival are appropriate but are not in the normal realm of the physician.

The question of whether a medical condition may be attributable to the occupation of policing is liable to produce strong emotions. When a police officer becomes ill there is an understandable desire on the part of other officers and, often, on the part of the public, to attempt to demonstrate a connection between the occupation and the illness. In line with this tendency several US states have policies in place to unquestioningly accept atherosclerotic heart disease among police officers as 'occupationally induced' for pension purposes. This leads to situations where the scientific evidence may be at odds with the political agenda of individuals and groups participating in the determination. This review will examine the evidence for a number of medical conditions. Specific occupational exposures, such as lead exposure among ballistics specialists, or chemical exposure among forensic laboratory workers are addressed elsewhere. Biohazard risks will be addressed in a later review.

Journal of Clinical Forensic Medicine (1995) 2, 105-110

#### ATHEROSCLEROTIC HEART DISEASE

The question of whether heart disease is more common among police officers has been asked repeatedly<sup>1-8</sup> and never been clearly or consistently answered. There is certainly no doubt that the risk factors known to lead to coronary artery disease are more common among police officers than among other sections of

society.<sup>2,3,7,9-11</sup> What is less clear is whether these risk factors are a necessary aspect of police work or whether they represent aspects of lifestyle common to the people who do the work, aspects of the police culture.

The demographics of the police population must be taken into account when assessing the risks for heart disease. Indeed, heart disease is most commonly found among middle-aged men, and this group makes up a very large proportion of police officers. Women, who have a significantly lower rate of heart disease, are significantly underrepresented in the demographics of most police forces.

A. Trottier MD, Director, RCMP Health Services, J. Brown MD, Chief, Occupational Health Section, Royal Canadian Mounted Police, 1200 Vanier Parkway, Ottawa, Ontario, Canada K1A 0R2.  
Correspondence to: A. Trottier.

The issue of demographics has caused some difficulty since the prevalence rate for coronary disease varies in different parts of the world. In one study, for example, the prevalence of coronary disease appeared to be higher in police officers than in American males of the same age, until it was determined that, regardless of occupation, the rate in that particular location was higher than the overall US rate.<sup>12</sup>

There have been numerous studies suggesting atherosclerotic disease is more common among police officers<sup>1-3,5,6,8</sup> but there are also studies suggesting that this is not the case.<sup>6,7</sup> One particular study was interesting in that it was suggested that the increase in the prevalence of heart disease among police officers was almost entirely due to the increased risk of acute myocardial infarction.<sup>8</sup>

This study is intuitively satisfying since it is well known that sudden exertion, in the face of underlying heart disease, is an important risk factor for sudden death.<sup>13</sup> The functional job analysis for general duty constable work has been published elsewhere<sup>14</sup> and clearly indicates that a police officer may be expected, in the course of duty, to go from the sedentary state to maximal exertion with little or no warning and with no preparation. Indeed, much police work is sedentary but, when required, the police officer is expected to run and chase, to grapple and tackle, and to forcibly restrain a suspect.<sup>14</sup> It is therefore not unexpected that even if the rate of underlying coronary disease is not much different among police officers than the rest of the population,<sup>6,7</sup> the risk of suffering an acute myocardial infarction, because of the nature of the work, may well be higher.<sup>8</sup>

Given this reality, then, the issue of whether or not the work itself results in a statistically higher rate of atherosclerotic disease becomes a secondary concern. More importantly, the work may result in an increased risk of dying from heart disease. An important goal of the physician providing medical care to police officers must be to identify risk factors for atherosclerotic heart disease and to attempt to modify these risk factors. Risk factors such as elevated blood pressure or serum cholesterol are well recognised. Risk factors such as obesity<sup>15,16</sup> and low levels of physical activity<sup>17-19,20</sup> must also be sought. There is good evidence that the modification of risk factors can reduce the risks of death from heart disease.<sup>13,21-25</sup>

Since many of the risk factors that give rise to cardiac disease seem to develop as individuals get older it is necessary to monitor the health of police officers throughout their careers in order to provide assistance in making lifestyle choices and to recognise a police officer with heart disease as early as possible. This is important both for the protection of the police officer

and, indirectly, the protection of the public safety. A police officer who suffers an acute cardiac event while engaged in a task critical to the safety of the public may die, and this is tragic, but we must also recognise that the task he was doing remains undone.

Many police forces require a medical examination at the time the police officer is recruited but do not require any regular re-assessment. It is illogical to assume that a medical assessment done 20 or more years ago provides any useful information about current health. This is particularly true with respect to cardiac risk factors which are likely to develop with time. Similarly, clinical symptoms of chest pain or angina may be elicited at the time of the periodic medical. The fact that no such symptoms were present at the time of recruitment is not particularly reassuring if the medical assessment was performed many years ago.

If one is to effectively reduce the risk of cardiac disease in police officers, the regular assessment of the police officer by a physician knowledgeable about police work and the potential cardiac risks that are associated with police work, is essential. The periodic health assessment must include health education and counselling about cardiac risk factors. There is good evidence that work based health promotion programmes have a salutary effect on employee health<sup>24,25</sup> and that the modification of cardiac risk factors reduces the risks of cardiac death.<sup>22,26</sup> Smoking cessation programmes, nutritional advice, hypertension awareness, cholesterol monitoring and modification, are all appropriate activities that will help modify risk factors for cardiac disease among police officers. The generation of a work environment that educates the worker about positive nutritional and lifestyle choices and that encourages such choices is likely to be beneficial.<sup>21</sup>

One of the most important cardiac risk factors that can be modified is the sedentary lifestyle which is common in society and which characterises a good deal of the work of policing. Regular exercise reduces the risk of a sudden cardiac event<sup>13,17,20,22</sup> that may result from an unfit police officer having to go from the sedentary state to maximal exertion.<sup>13</sup> Since this kind of sudden acceleration of activity is an integral part of police work,<sup>14</sup> steps must be taken to ensure that the potential for dangerous consequences is minimised. These steps centre on reducing risk factors for cardiac disease.

In summary, at present it is uncertain whether or not police work increases the risk of cardiac disease but it is clear that cardiac risk factors are more common among police officers and that some aspects of police work may increase the risk of sudden cardiac death. In order to modify these risks, periodic medical assessment is recommended in conjunction with workplace based

programmes to encourage regular exercise and modification of known cardiac risk factors. These factors include cholesterol elevation, hypertension, cigarette smoking, obesity and low levels of physical activity.

### LUNG DISEASE IN POLICE WORK

The evidence suggests that the prevalence of lung disease in police work is lower than in the general population.<sup>1,5,27</sup> There is, however, evidence of an increased rate of cancer of the respiratory system.<sup>7</sup> The majority of police officers are not routinely exposed to inhaled toxins at a rate any greater than other residents of the communities they police. However, there are exceptions to this general rule, the most notable exception being police officers working in forensic identification. There is good evidence that these individuals may suffer from an increased prevalence of respiratory symptoms and, possibly, occupational asthma.<sup>28</sup> Cyanoacrylate, used in uncovering latent fingerprints, is a known respiratory sensitiser. In addition to this, there are a large number of chemical carcinogens routinely used in this type of work. For these reasons it is recommended that police officers who work in forensic identification, particularly those who do fingerprint work, should undergo an annual chest X-ray and spirometry. Similarly, periodic health assessments of these officers must include a careful assessment of the respiratory system.

Even though the practice of smoking cigarettes is becoming less common, a significant number of police officers continue to smoke.<sup>2</sup> This may be the reason why some studies have shown an increased risk of lung and laryngeal cancers among police officers. Smoking is, of course, a major risk factor for cardiac disease, as previously discussed. It is also the leading cause of lung cancer. When a police officer gets lung cancer the question frequently asked is whether the cancer is due to occupational exposure, in particular to the carcinogens known to be present in fingerprint powders. If the police officer smokes, it will be impossible to confidently assign blame to any occupational exposure.

Some police officers may be at an increased risk for tuberculosis. This will be discussed in a separate review in this series on biohazards.

In summary, respiratory disease is not normally an occupational hazard of police work except for forensic identification workers. These individuals should undergo an annual chest X-ray and spirometry.

### CANCER

There is some evidence that police officers suffer a higher risk of cancer than expected in the general popu-

lation.<sup>1,5,7,29</sup> In particular, the risk of digestive tract cancers such as cancer of the oesophagus, cancer of the stomach and cancer of the large bowel is reported to be elevated among police officers.<sup>1,5</sup> There may be an increased risk of cancer of the lung and larynx.<sup>7</sup> The risk of cancer among police officers working in forensic identification and forensic laboratory work has been briefly discussed above. The controversial issue of testicular cancer associated with the use of police 'radar' to detect speeders must also be addressed.

The data suggesting an increase in the risk of cancer of the digestive tract among police officers is scant<sup>1,5</sup> but it is a question that must be seriously examined. In the case of lung and oesophageal cancer it is difficult to see how the activities of police work would be expected to increase the risk. Smoking, of course, is known to increase the risk of both lung and oesophageal cancer, and we know that significant numbers of police officers continue to smoke cigarettes. Another substance known to increase the risk of oesophageal cancer is alcohol, particularly whisky.<sup>30</sup> Police work is known to be exceedingly stressful and there have been some studies that suggest police officers may sometimes use alcohol to relieve the tension and stress of their work.<sup>31,33</sup>

The same research that demonstrated an increased risk of cancers of the digestive tract<sup>1,5</sup> also demonstrated a peculiar increase in the incidence of cancers of the lymphatic and haemopoietic systems in police officers who have had between 10-19 years of service. The prevalence in police officers with less than 10 years' service or those with over 19 years' service was less than the general population so that the overall rate was not significantly increased. Given this very peculiar distribution, and the small numbers, this finding may well turn out to be a statistical aberration.

If there is evidence that the cancers known to be associated with the use of tobacco and alcohol may occur at a higher than expected rate among police officers, regardless of the mechanism for the increase, then it follows that the use of tobacco and alcohol must be viewed as particularly risky for police officers. Accordingly, police officers must be educated and encouraged not to smoke and not to drink to excess. The first line of defence against these risk factors are periodic health assessments performed by physicians knowledgeable about the risks of police work and who are in a position to provide effective counselling.

The second line of defence is probably some version of an employee assistance programme coupled with readily available clinical psychologists or psychiatrists educated in the field of substance abuse behaviours and willing to assist. This will be discussed further in a later

mini-review. The third line of defence is a work based program of health education and promotion.

It is important to maintain the perspective that the goal is to reduce the use of alcohol and tobacco. The present context is that of reducing risk factors for cancer. There are other reasons for intervention in behaviours associated with alcohol use that will be discussed elsewhere. Whatever the reason, it is vital that medical confidentiality be respected. Any form of substance abuse is viewed, initially, as a medical issue not a disciplinary issue unless there is frankly illegal behaviour. The role of the health professional in police work must be supportive and helpful, not judgemental.

Similarly, there are well-recognised risk factors for the development of cancer of the large bowel which should be monitored in the context of police work. It has long been known that diets high in calories, high in fat and high in meat products, characteristic of 'fast foods', are associated with colonic cancer.<sup>30</sup> Accordingly, if there is evidence that police officers have a higher than expected rate of bowel cancer<sup>1,5</sup> then it is appropriate that vigorous attempts be undertaken to provide nutritional education and to encourage regular exercise to counter the sedentary activities that characterise much of police work. In addition, sigmoidoscopic or colonoscopic screening at regular intervals, and at appropriate ages, is considered prudent and should be recommended and supported.

The risk of cancer among police officers involved in forensic identification work and forensic laboratory work has been discussed. The expected toxicities of chronic low level exposure to various chemicals are determined by the level of exposure and the use of personal protective equipment. Based on these exposures a periodic health examination, performed annually, and tailored to risks specific for these exposures has been developed.<sup>14</sup> This examination includes hepatitis B screening, chest X-ray, spirometry, liver enzymes, renal function, complete blood count, urinalysis, electrolytes, calcium, phosphate, thyroid function, electrocardiogram and stool for occult blood.

The question of cancer resulting from exposure to microwaves from 'police radar' units has created much controversy. There is certainly some evidence that there may be clustering of certain kinds of cancers among police officers exposed.<sup>29</sup> The particular concern is about exposure from hand held units. Alternatively, there are a number of publications that refute any risk of carcinogenicity from exposure to these units.<sup>34,35</sup> Testicular cancer, in particular, has been reported to be associated with such exposure. The circumstance said to pose the greatest risk is that where the police officer holds the hand held unit, turned on, and resting on the lap. This

could result in considerable cumulative exposure of the testes over the long-term. Whether such exposure causes cancer remains unproven. The issue is currently under intense study. In the meantime it is recommended that police radar units be mounted outside the police car, directed away from the police officer, not be used inside the car, be turned off when not in use and be tested regularly for microwave leakage. In addition the periodic examination of police officers should include careful palpation of the testes.

In summary, the evidence that some forms of cancer are associated with police work is weak and inconsistent, nevertheless risk factors for these types of tumours are well known. Efforts to identify risk factors among police officers and to alter lifestyle choices and work habits that may increase cancer risks are appropriate.

### BACK PAIN

Low back pain is a major cause of absenteeism throughout the Western world. It is a condition most common among middle-aged males.<sup>36,37</sup> The factors which predispose to chronic low back pain are multiple<sup>36</sup> and some, such as the correlation to smoking,<sup>36</sup> seem intuitively difficult to comprehend. There are two major predictors that are particularly relevant in the police context: significant time spent in a motor vehicle and a low level of fitness.

With respect to the occupation of driving, there is ample evidence<sup>38</sup> that individuals who drive for a living are at a dramatically increased risk of low back pain. This observation includes police officers for whom driving plays a significant part in their daily work. It was for this reason that the Institute de Recherche en Santé et en Sécurité du Travail du Quebec, Canada, instituted a study to examine the design of the patrol car passenger compartment.<sup>39</sup> As a result of this study an improved design was developed. The reality, unfortunately, is that the majority of police cars continue to be equipped with the seats that were installed at the time of their manufacture. Various back supports and prosthetic devices are available which may improve the support of the lumbar spine but the problem remains.

There is no doubt, however, that a high fitness level and, in particular, specific exercises designed to maintain flexibility and strengthen the muscles of the back can significantly improve function and symptoms.<sup>40-43</sup> The Quebec Task Force on Spinal Disorders has identified five distinct syndromes of low back pain.<sup>44,45</sup> These five different patterns have five distinct approaches of active intervention through specific muscle strengthening programmes.<sup>45</sup> It is important that specific symptom patterns be sought out among police officers and that

appropriate intervention and treatment be initiated. This requires periodic assessment by physicians knowledgeable in this clinical syndrome and capable of early effective intervention. It is equally important that a good level of overall fitness be maintained in order to avoid disability from this common chronic costly syndrome.

In summary, low back pain is an occupational hazard of police work which is responsible for considerable pain, disability and sick leave. Orthotic support of the lumbar spine may be of assistance but while seats specifically designed for patrol cars are available, they are not specifically designed for individuals with back problems and are not universally installed by all police forces. Periodic assessment of police officers, in order to identify specific low back pain syndromes with the prescription of specific exercise programs, is logical and should reduce the morbidity and the economic costs from this problem. A good level of overall fitness and flexibility may be reasonably expected to reduce the incidence of chronic low back pain.

## VIOLENCE

Violence is, unfortunately, a reality of police work. In the US the homicide rate for police is more than double that for the general population. Work related violent assault is common among police officers.<sup>46</sup> In 1991 there were 1954 assaults on police reported in the US.<sup>47,48</sup> In Canada it is less of a problem than in the US but a bigger problem than other developed countries such as Australia.<sup>49</sup> The particular activities that are likely to result in violent conflict have been the subject of much recent research. The notion that domestic dispute calls were particularly dangerous was seriously questioned as long ago as 1986.<sup>50</sup> More recently, the activities ranked as most likely to result in the assault of a police officer<sup>51</sup> were as follows:

1. Arresting/controlling suspects
2. Robbery in progress
3. Domestic dispute.

The avoidance of assault and the utilisation of techniques to reduce the risk are to be found in research dealing with operational aspects of police work.<sup>52</sup> From the perspective of police officer health, these techniques should be employed since prevention is always preferable to cure.

Given the inevitability of violent encounters at work, it is imperative that the physician caring for a police officer be able to deal with the results of violent injury. The immediate result is, of course, standard trauma management. Occasionally, however, more chronic

sequelae of assault may be present. A behaviour change in a police officer, for example, may have a physical cause such as post traumatic subdural haematoma but emotional or psychiatric causes must also be considered.

The sequelae of violence need not be physical. Violent encounters are exceedingly stressful. This stress is particularly likely if the incident has resulted in serious injury, bloodshed or death. Particularly important is the assessment for post traumatic stress disorder after such incidents. This subject will be dealt with more fully in a later review in this series.

When examining a police officer, then, as part of a periodic health assessment, it is important to seek out evidence of physical trauma. The results of physical trauma may be either physical or mental. Near miss situations are equally capable, as actual events of causing post traumatic stress disorders must also be sought out. The physician assessing the police officer must also bear in mind that police officers are often individuals who need to be in control. Part of this need may manifest in denial of the emotional impact or consequences of violence on the job. It may also give rise to inappropriate coping mechanisms. When a police officer is having marital or alcohol problems, the physician must consider the possibility that the police officer is having difficulty coping with post traumatic stress.

In summary, violence is an undeniable reality in police work. It can give rise to physical as well as emotional problems. The physician caring for a police officer must seek out evidence of physical as well as emotional causes of stress. Sometimes, because of the cultural attributes of police officers, it will be necessary to probe.

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