

**WCAT Decision Number :** WCAT-2008-01675  
**WCAT Decision Date:** June 05, 2008  
**Panel:** Janice A. Leroy, Vice Chair

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## Introduction

The worker is a now 49-year-old telecommunications worker, who developed sudden right elbow pain on December 15, 2006, which she attributed to recent duties associated with a special project involving extensive mousing work. In decisions dated May 25 and November 7, 2007 respectively, a case manager with the Workers' Compensation Board, operating as WorkSafeBC (Board), and a review officer with the Review Division of the Board, denied compensation for the worker's diagnosed right lateral epicondylitis, under both sections 5 and 6 of the *Workers Compensation Act* (Act).

The worker appealed the review officer's decision to the Workers' Compensation Appeal Tribunal (WCAT). She appeared at an oral hearing with her representative and gave sworn testimony. A representative appeared via telephone on the employer's behalf and opposed the appeal.

## Issue(s)

The issue is whether the worker's diagnosed right lateral epicondylitis should be accepted, either as a personal injury or as an occupational disease.

## Jurisdiction

Section 239(1) of the Act states that, with limited exceptions (which do not apply to this appeal), final decisions made by review officers in reviews under section 96.2 may be appealed to WCAT. Section 253(1) provides that WCAT may confirm, vary or cancel the appealed decision or order.

## Background and Evidence

The worker began work with the telecommunications provider employer in 1979. She typically worked as a clerk, performing a variety of clerical and administrative tasks. However, from March to September 2006 she did field work, recording and taking photographs of roadside boxes. In September 2006 she began work on a special project that involved using a computer drafting program, which required virtually constant mousing. She would left-click on one end of a fibre line on the screen, then drag the pointer to the next turn in the line, click again, drag to the next turn, click again, and so on. This would take two to four minutes. She would then hand-record the

resulting length measurement. This would take about five seconds. This process was repeated, all day everyday, apart from the first 45 minutes to one hour of the day, when she checked and returned emails, one, 15-minute break, and one 1-hour lunch break.

On December 15, 2006, while she was working, the worker experienced a sudden onset of right elbow pain. Her pain worsened as she continued to work, but she did not report the pain, or see a doctor, as she had planned holidays from December 21, 2006 through January 1, 2007. Her symptoms improved over her vacation, but immediately recurred upon her return to work.

The worker saw Dr. Murray, chiropractor, in January 2007, complaining of right elbow symptoms. He was unable to resolve her complaints, and referred her for a trial of acupuncture. In a letter dated March 28, 2007, Dr. Murray said it was his opinion that the worker's right elbow injury was work-related.

Acupuncture did not improve the worker's symptoms, nor did massage treatments with a massage therapist on January 12, February 9, and March 10, 2007.

The worker reported her elbow symptoms to her employer on February 20, 2007.

A second chiropractor, Dr. Chin, advised in a letter dated March 19, 2007 that he had seen the worker on February 2, 2007. Her primary complaint was of right lateral epicondyle pain to the middle arm. Symptoms were aggravated by computer work, with a pain intensity of 7 to 8 out of 10. He advised he treated the worker with chiropractic and acupuncture treatments, but with limited results. He said that to reduce the possibility of developing a chronic condition, he recommended a cortisone injection and a period of two to four weeks off work. He said the injury was most likely a repetitive strain/sprain condition due to computer work.

In a physician's report dated March 20, 2007 the worker's physician, Dr. James, diagnosed tendonitis of the right epicondyle, saying repetitive use of a mouse at work had resulted in persisting pain in the worker's right elbow.

The worker filed an application for compensation on March 21, 2007. She explained that she had been working on a special project, on a rush basis, which required mouse use for seven hours per day. On the morning of December 15, 2007, when as she began to mouse, she felt a sharp pain in her right elbow. The pain settled over her holidays, but increased with each day back at work, until it was essentially unbearable. She went to a chiropractor on January 5, 2007. Chiropractic treatment did not help. She saw a second chiropractor, who had a different technique. Those treatments did not help, nor did massage therapy or acupuncture.

In a discussion with the Board case manager on April 2, 2007 the worker advised she was of normal weight, did not smoke, rarely drank alcohol, went to the gym daily to use

the treadmill and do light weights, and played slow pitch in the summers. She had no right elbow pain before December 15, 2006. She did not report her injury because she did not actually have a manager at that time, but her co-workers were aware of her elbow pain.

A case manager attended the worker's work site on May 15, 2007 to complete a worksite evaluation report. She interviewed the worker and recorded essentially the same facts as she had recorded in the claim log on April 2, 2007. She added that the worker also played volleyball once per week, but the last time had been in November due to elbow symptoms. The case manager reported that she had not noticed any awkward postures at the elbow, and that she had observed only 40 to 45 degrees of right wrist extension while the worker moused. She said this degree of extension was essentially neutral. She said forces were only nominal.

In a claim log memorandum dated May 24, 2007, a Board medical advisor reviewed the claim file material and Board policy concerning epicondylitis, which provides that where the worker was occupationally performing frequent, repetitive, forceful and unaccustomed movements (including forceful grip) of the wrist that are reasonably capable of stressing the inflamed tissues of the arm affected by epicondylitis (extensor muscle group of the wrist and forearm supinators), in the absence of evidence suggesting a non-occupational cause for the epicondylitis condition, a strong likelihood of work causation will exist.

The medical advisor said that as the worker's job involved no awkward postures of the wrist or elbow, no repetition, and no forces, her lateral epicondylitis could not be related to her work activities.

The Board case manager then issued the May 25, 2007 decision letter under appeal, denying the worker's claim, both as a personal injury and as an occupational disease. The review officer confirmed this decision in the November 7, 2007 Review Division decision under appeal.

In support of the worker's appeal to WCAT the worker's representative filed a copy of her solicitation to Mr. Zivanovic, a kinesiologist, for an ergonomic evaluation of the worker's work tasks while she worked on the special project, along with Mr. Zivanovic's "Document Review & Worksite Analysis" report.

In his report, Mr. Zivanovic advised that he had attended the work site and evaluated the risk factors for right lateral epicondylitis on April 17, 2008. He explained that epicondylitis can occur when the tendons that attach at the elbow develop microscopic tears and inflammation. Damage to extensors on the radial side of the forearm is diagnosed as lateral epicondylitis.

Mr. Zivanovic said it is readily apparent from an analysis of the video footage and still images that he had captured of the worker while she worked, that she has a habit of extending her right wrist while manipulating the mouse, and specifically of extending her middle finger on the right hand when mousing. He said these constant extensions demonstrate that the worker continually applies force through her extensor muscles as she mouses.

Mr. Zivanovic noted the case manager had characterized the forces involved in the worker's mousing work as nominal. He acknowledged that the amount of force required in the worker's job could be viewed as atypical of the high forces that usually correspond with injury. However, he said, this would ignore the cumulative loading on the tissues from virtually constant static loading over a seven-hour day. As the isometric contractions continue throughout the day as the worker continually clicks and holds, the "once high tolerance level of the tissues decreases, causing injury." The weight of the worker's arm and hand remain constant while the degraded or fatiguing tissues become weaker and weaker, from maintaining the same posture for an extended period of time. He referred to a 1993 Scandinavian study<sup>1</sup> for the assertion that in similar cases "previous exertions have been known to reduce substrate levels or increase metabolite levels so that fewer exertions are tolerated before fatigue and discomfort occurs. Similarly, prior exertions can result in residual deformation of connective tissue so that fewer exertions or lower force is required to produce microfailures." He said this "high frequency low force" applied to the anatomical structures of the forearm was the most likely factor precipitating the worker's onset of symptoms. He said that although the worker experienced a sudden sharp pain on December 15, 2006, it was less than 50% likely that one motion at one instant was the cause of the injury. He said the worker's intensive mousing, over months, resulted in a cumulative trauma injury.

Mr. Zivanovic went on to say that pronating one's hands, as is required when working at a computer, causes the distal heads of the radius and ulna to cross, thus compressing the soft tissues in the arm in a scissor-like fashion. The compression forces applied to the blood vessels and nerves between the radius and ulna lead to decreased axoplasmic flows and oxygen supply to the wrist and hand.

Mr. Zivanovic said the local mechanical stresses from constant pressure on the tip of the right index finger, which in turn applied pressure through the forearm, might also have been a factor, through vasoconstriction in the extensors of the forearm, leading to insufficient blood flow. He said the fact that the work was unaccustomed was also likely a factor in onset of the worker's lateral epicondylitis; as a fit individual, accustomed to lifting light weights on a daily basis, the worker's forearm muscle strength and density increased her ability to tolerate activities such as mousing, but muscles can adapt faster

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<sup>1</sup> Armstrong et al., "A Conceptual Model For Work-Related Neck and Upper-Limb Musculoskeletal Disorders," *Scandinavian Journal of Work, Environment and Health*, 19, (1993), 72-84., J. Thomas.

than tendons, resulting in reduced tendon capacity, precipitating injury. He said the length of the time lapse between commencing the job and onset of symptoms was an indication of the worker's overall physical conditioning.

Mr. Zivanovic concluded that on the whole of the evidence it was more likely than not that the worker's lateral epicondylitis was due to the nature of her work over the period that she worked on the special project.

Mr. Zivanovic attached an abstract of a study<sup>2</sup> published in 2005, undertaken by Judy Village, David Rempel, and Kay Teschke, which was a critical review to evaluate the 33 studies that had been published since 1990 that supported a causal relationship between computer work and musculoskeletal symptoms and disorders of the hands, wrist, forearm and elbow. However, apart from referring to this study in the body of his report, as he did with other studies set out in his list of references, he did not otherwise discuss the study. Accordingly, I did not read or consider the study.

At the hearing, the worker gave testimony consistent with the background facts set out above. She advised that she normally worked from 6:30 a.m. to 3:00 p.m., with one break and one lunch hour, such that she actually worked 7.5 hours per day. She said that while she was on the special project she usually checked emails and did some calendar work first thing before beginning the project work. At her doctor's suggestion she took three days off in February 2007, during which her symptoms improved somewhat. She did not like taking time off work and thus returned to work sooner than her doctor recommended, but ceased doing the special project work. From that point, she resumed her previous clerical duties. However, her elbow remained troublesome, and her doctor scheduled her for a cortisone shot and told her to take more time off work. She went off work on March 21, 2007, had the cortisone shot on March 30, 2007 and returned to work on April 4, 2007. With the rest and the shot, her symptoms were about 60% improved and she was able to continue with her normal clerical duties. However, she has recently started a new job, which seems to aggravate the condition.

The worker explained that the volleyball activity to which the case manager referred was in fact walleyball, which is game that is something like volleyball, but played with a suede ball in a squash court, with three players on each side. Her season ended in early December 2006, and they had two tournaments after that, with her final walleyball game on December 13, 2006. She had no elbow symptoms in association with walleyball; nor for that matter did she have any elbow symptoms in association with any of her other long-time leisure activities, such as baseball in a summer beer league, cycling to work, and doing light weights in the gym on her lunch hours. It had been her practice to do lower body work one day at the gym, and upper body work the next. She used a maximum of 15 pounds for her upper body work. She had to cease the upper

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<sup>2</sup> Village et al., "*Musculoskeletal Disorders of the Upper Extremity Associated with Computer work: A Systematic Review*," *Occupational Ergonomics* 5 (2005) 205-218.

body workouts for about four months, until the end of April 2007, on account of her epicondylitis. When she resumed her workouts, she started at three pounds. She has not yet progressed back up to 15 pounds.

The worker said she decided to file a claim when her symptoms did not improve with therapy, and the therapy costs began to build up.

In her submission the worker's representative said that the fact that the worker did almost no mousing for many months while she was taking photographs in the field, then did almost exclusively mousing for three months before developing her symptoms; the fact that during those three months there was almost no task variability; the fact that her symptoms improved away from work; the fact of Mr. Zivanovic's opinion; and given that her symptoms came on at work, she had no previous symptoms with any of her long-time activities, she had no systemic diseases or conditions, and the condition was on the right side only, all indicated this claim ought to be accepted.

The employer's representative said the fact of a sudden onset rather than a gradual onset; the fact that the worker did not make a claim until her therapy bills began to add up; and the fact of the medical advisor's opinion, all indicated the claim ought not to be accepted. He also pointed out that in her report of the site visit, the case manager reported that the worker had advised that she had ceased playing walleyball in November, on account of symptoms.

The employer's representative said I should not rely on Mr. Zivanovic's report; he was no more qualified than the case manager to observe the worker's work motions; he used terms that were atypical of the terminology typically employed when discussing activity-related soft tissue disorders (ASTDs); and his report seemed to be a lot of words without much substance.

## **Reasons and Findings**

Section 250(2) of the Act obliges WCAT panels to apply applicable policies of the board of directors of the Board in reaching appeal decisions. The policy applicable to this claim is set out in the *Rehabilitation Services and Claims Manual, Volume II* (RSCM II).

Section 5 of the Act provides that compensation is payable when a worker suffers a personal injury arising out of and in the course of employment.

Item #25.10 of the RSCM II explains that a disease that is attributed to or is the consequence of a specific event or trauma, or to or of a series of specific events or traumas, will be treated as a personal injury, and will be adjudicated in accordance with the policies applicable to injuries. The corollary of this is that when a worker does not allege any incident or trauma in connection with his or her onset of symptoms, the disease will be adjudicated as an occupational disease.

In the present case the worker described her symptoms as having come on suddenly, while working, but not in connection with any incident or trauma, so her epicondylitis condition is most properly adjudicated as an occupational disease.

Section 6 of the Act provides that compensation is payable when a worker suffers from an occupational disease that is due to the nature of his or her employment. An occupational disease is:

- Any disease mentioned in Schedule B;
- Any disease that the Board has designated as peculiar to or characteristic of a particular process, trade or occupation; and,
- Any other disease which the Board, by regulation of general application or by order dealing with a specific case, may designate or recognize as an occupational disease.

Lateral epicondylitis is one of a number of conditions that the Board classifies as ASTDs. It is designated as an occupational disease by regulation of general application. It is not recognized as peculiar to or characteristic of a particular process, trade or occupation. The effect of such a designation is to recognize that epicondylitis is sometimes due to the nature of employment, but there is no presumption in favour of work causation. The evidence must establish a causative link between the condition and the employment.

The Mayo Clinic website<sup>3</sup> explains that tennis elbow is an overuse injury, caused by repeated contraction of the forearm muscles that are used to straighten and raise the hand and wrist. The repeated motions and stress to the tissues may result in inflammation or a series of tiny tears in the tendons that attach the forearm muscles to the bone at the outside of the elbow.

As the name tennis elbow indicates, playing tennis — particularly, repeated use of the backhand stroke with poor technique — is one possible cause of the condition. However, many other common arm motions can cause tennis elbow, too — including using a screwdriver, hammering, painting, raking, weaving and others.

Item #27.31 of the RSCM II explains that the medical/scientific literature on epicondylitis does not as a whole confirm a strong association with employment activities, and its mechanisms of development are obscure. However, some studies do indicate an excess incidence of epicondylitis in employments involving activities that are strenuous to the muscle-tendon structures of the arm. The theory is that microtears at

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<sup>3</sup> <http://www.mayoclinic.com/health/tennis-elbow/DS00469/DSECTION=3> (Last accessed June 2, 2008).

the attachment of the muscle to the bone may be due to repetitive activity with high force sufficient to exceed the strength of the collagen fibres of the tendon attachment, and this in turn may lead to the formation of fibrosis and granulation tissue.

The policy provides that when work tasks require frequent, repetitive, forceful, and unaccustomed movements (including forceful grip) of the wrist, in the absence of evidence suggesting a non-occupational cause, a strong likelihood of work causation will exist. The question is whether the evidence on the whole leads to a conclusion that the epicondylitis is due to the nature of the employment.

Item #27.40 of the RSCM II explains that there are a number of possible risk factors relevant to ASTDs in general, and explains the role each factor can have in onset of an ASTD.

<b>Performance of the work risk factors</b>	<b>Work environment risk factors</b>	<b>Individual risk factors</b>
Repetition	Ergonomic aspects	Age
Force	Work organization	Smoking
Static loading	Work behaviour	Previous similar history
Task variability	Cognitive demands	Diabetes mellitus
Awkward postures	Rest breaks/rotation	Inflammatory disorders
Point pressures		
Shock		
Grip type		
Vibration		
Extremes of temperature		
Unaccustomed		

The worker's occupational tasks must be considered in light of the risk factors set out in item #27.40, to determine whether those tasks require frequent, repetitive, forceful, and unaccustomed movements (including forceful grip) of the wrist, such as could lead to the conclusion that her lateral epicondylitis was due to the nature of those tasks, and whether the evidence on the whole leads to a conclusion that the epicondylitis is due to the nature of the employment.

That policy cautions that the relative importance of the listed risk factors varies with the circumstances of each claim, and suggests the decision-maker consider, with respect to each risk factor, the location of the affected area, the intensity of the risk factor, the time frequency or time variation of the risk factor, and the duration of the risk factor, to assess its potential to cause or contribute to the development of the particular ASTD.

Repetition refers to the cyclical use of the same body tissues, either as a repeated motion, or as repeated muscular effort without movement. The shorter the time variation of a repeated muscle, tendon, or joint movement required to perform a task,

the less time the affected tissues will have to return to the resting state for recovery, and the higher the potential for causing an ASTD. The time variation of repetition may be expressed as the frequency of the work cycle.

Task variability is relevant to the degree of repetition in a job. It refers to the degree to which the task remains unchanged, thus causing loading of the same tissues in the same way, particularly if there is no change or interruption in a repeated task. The less varied the task, the less likely the affected tissues are able to return to a resting state for recovery.

The Board publishes the ASTD Reference Guide (ASTD Guide) as a resource for Board officers. Officers may use the guide to inform their decision-making process concerning ASTDs. The reference guide is not Board policy, and Board officers are not obliged to consider or apply it in making their decisions. Nor are WCAT panels obliged to do so. However, to the degree that it clarifies policy it can be of some assist in adjudicating ASTD claims.

The ASTD Guide states that researchers have suggested the following guidelines for risk identification from repetition, and assessment of it:

- Cycle = time to complete one unit of work or one task or activity (for example, to assemble, lift an item or inspect one item)
- Repetitious if cycle time is less than 2 minutes (if no task variability)
- Highly repetitive if less than 30 seconds or if repetitive cycles make up 50% of total workday
- International Labour Office (ILO) suggests cycles less than 10 seconds induce muscular fatigue and require longer rest
- 1.5 minutes optimal for tasks with fast working pace
- Repeated cycle must be performed continuously for a minimum of 60 minutes in order for the following to be considered repetitive:
  - shoulder – 2.5/minute (for example, flinging plywood)
  - upper arm/elbow – 10/minute (for example, pushing boxes along conveyor)
  - forearm/wrist – 10/minute (for example, turning boards in sawmill)
  - intense keyboarding (for example, – 200 finger movements/minute – less evidence for this).

In the present case the work cycle was a minimum of two minutes of click-drag-click-hold, followed by five seconds of rest, performed essentially continuously for 6-½ to 7 hours per day. This 2-minute to 5-second ratio of muscular exertion/loading to rest, qualifies as highly repetitious, even constant.

Returning again to item #27.40, static loading refers to when a limb is held or maintained against gravity, or against some other external force. Static loading is also present when, upon moving a limb, the musculoskeletal load does not return to zero after each motion. Although static loading is not specifically mentioned as a relevant risk factor for epicondylitis, the presence or absence of static loading in a task has an impact on the degree of force exerted to perform the task. As there are limitations to the body's ability to deal with such sustained loads, the duration and time variation elements become important, as well as task invariability.

The force risk factor refers to the musculoskeletal load on the tissues involved. This load may be imposed on the body through tension (such as muscle tension), pressure (such as increased pressure in the carpal canal), friction (such as between a tendon and its surrounding sheath), or irritation (such as irritation of a peripheral nerve). The greater the magnitude/intensity of the force required by the muscle/tendon group involved, the greater the potential for causing an ASTD, and the shorter its latency.

The ASTD Guide goes on to explain that force may be an external load to the body, for example, weight of object grasped or pushed or may be an internal force on the body structures generated by muscle contractions, for example, to grip and move, overcome gravity effects, etc. The two are not necessarily related: For example, in meat cutting the weight of a knife is a low external force, but the internal gripping forces needed to cut meat may be very high.

The amount of force that can be safely applied is related to the duration of application and is exponential, that is, 10% decrease in load can increase work time five to six times before fatigue becomes a limiting factor. The amount of recovery time required is related to amount and duration of force application and is exponential.

I accept that, at first blush, the forces involved in the worker's mousing activity were low. However, as the duration of the application of force (static pressure or loading) through the extensor muscles of the worker's right hand and forearm was more or less constant for 6-½ to 7 hours per day, I find the forces involved were sufficient to fatigue the extensor tendons that attach at the lateral epicondyle.

Returning once more to item #27.40, unaccustomed activity occurs when one performs new tasks, such as when using a new machine, or returning to work after a leave or other absence. Resistance to injury is considered to be lower for unaccustomed activity due to a lack of acclimatization/adaptation. The general fitness level of the person may have an impact on this factor.

Generally, one would not consider an activity that a person has been doing for three months to be an unaccustomed activity. And generally, I agree with the employer's representative that Mr. Zivanovic's report seemed almost to obfuscate, rather than clarify the issues. The report would have been far more helpful had it been written in plain, clear and simple language. However, I nevertheless accept Mr. Zivanovic's explanation that it is likely that the worker's superior forearm muscular fitness allowed her to absorb the unaccustomed strain through her forearm muscles, thereby extending the period over which she was able to tolerate the strain, whereas the microfibrils of the tendons, which would not have been so conditioned by the gym workouts as were the muscles, and would not have adapted to the new activity as quickly as did the muscles, eventually gave way to the unrelenting pressure of the mousing work through the extensor muscle/tendon forearm group.

### **Conclusion**

The worker's appeal is allowed. I find it is more likely than not that the worker's diagnosed right lateral epicondylitis was due to the nature of her employment; specifically, it was due to the extensive mousing work she performed over the period from September 27 through December 15, 2006.

The review officer's decision is varied. The claim is referred back to the Board to accept the worker's claim, and pay and provide the benefits now due the worker.

### **Expenses**

The worker missed about three hours of work to attend the hearing. The Board shall reimburse her lost wages. The Board shall also reimburse the expense of obtaining Mr. Zivanovic's report, in the invoiced amount, which is in the range of the amount the Board has paid for such reports in the past.

No other appeal expenses were requested. None are ordered.

Janice A. Leroy  
Vice Chair

JAL/jkw