Cumulative Trauma Disorders: A Hidden Downside to Technological Advancement

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COMMENTS

CUMULATIVE TRAUMA DISORDERS: A HIDDEN DOWNSIDE TO TECHNOLOGICAL ADVANCEMENT

Cumulative trauma disorders (CTDs), or repetitive stress injuries (RSIs), affect the upper extremities of many workers as they routinely perform their jobs. "CTDs are the fastest growing category of workers' compensation claims, accounting for approximately sixty-one percent of all workplace illnesses." According to the Bureau of Labor Statistics, the occurrence of CTDs rose roughly 1,000% from 1982 to 1991. The problems associated with CTDs are now entering court rooms in the form of product liability suits against manufacturers. The product manufacturers vulnerable to suit range from those that produce computer keyboards to Nintendo game products and supermarket checkout scanners. Although CTD victims generally are successful in obtaining workers' compensation for their injuries, they face having difficulty as plaintiffs in product liability suits proving that a particular product caused their inju-

1. Jeannie Mandelker, Cumulative Trauma Increases Workers' Compensation Claims, BUS. & HEALTH, Apr. 1993, at 28. Mental stress and increased demands for productivity are possible explanations for this increase in CTDs. Id. at 29-30.
2. Id. at 28. The Bureau of Labor Statistics reported 223,600 cases of CTDs in 1991. However, the National Institute for Occupational Safety and Health (NIOSH), an Atlanta, Georgia, based federal research agency, has disputed these findings. It asserts that the Bureau of Labor Statistics' findings are too low and that 25% of all workers suffer from CTDs. Id.
3. Jeffrey S. Ghannan, Teen Sues Video-Game Maker Over Wrist Injury Suit Claims Nintendo Failed To Warn of Carpal Tunnel Syndrome, DETROIT FREE PRESS, Aug. 20, 1991, at 2A. A teenager claimed that playing Nintendo games caused her to develop carpal tunnel syndrome and filed suit against Nintendo of America Inc. and Toys R Us seeking more than $10,000 in damages. The teen claimed Nintendo failed to warn users of the potential hazard of developing a CTD. See Burroughs v. Northern Telecom, Inc. (In re Repetitive Stress Injury Cases Pending in the United States Dist. Court for the E. Dist. of N.Y.), 142 F.R.D. 584 (E.D.N.Y. 1992). All CTD cases pending in the United States District Court for the Eastern District of New York were consolidated before Judge Hurley. Id. at 588. The plaintiffs in this suit claim that they developed CTDs from the routine use of computers, adding machines, supermarket checkout scanners, and other mechanical and electrical devices. Id. at 584.
Because the medical community is divided over the cause of CTDs, the courts are reluctant to recognize a causation factor between a product's design and the alleged injury.5

This Comment first defines CTDs and discusses certain treatments and methods currently being developed and utilized by the medical profession to cure and/or prevent CTDs. It then briefly explains how CTDs are provided for under state workers' compensation benefits administration.

4. See Lawrence Chesler, Repetitive Motion Injury and Cumulative Trauma Disorder: The Wave of Products Liability Arrives, COMPUTER LAW., May 1993, at 21, 22. Chesler, Vice President and General Counsel of the Network Application Systems Division of N. Telecom Inc., notes that the petition by the plaintiffs in the Burroughs' case to have all CTD-related cases throughout the United States, as opposed to only cases in the Eastern District of New York, transferred to the Eastern District of New York. Id. The petition was denied because the court was "not persuaded . . . that the degree of common questions of fact among these actions rises to the level that transfer . . . would best serve the overall convenience of the parties and witnesses and promote the just and efficient conduct of this entire litigation." Burroughs v. Northern Telecommunications, Inc. (In re Repetitive Stress Injury Products Liability Litigation), No. 955 (J.P.M.L. filed Nov. 27, 1992). Chesler argued that the court's use of the language "degree of common questions of fact" referred to the plaintiffs' inability to prove causation. See also Mastalski v. IBM, No. 92-1016, 1992 U.S. App. LEXIS 20730, at *17 (4th Cir. Aug. 28, 1992) (affirming the district court's granting of summary judgment to IBM partly because plaintiff could not identify any causal link between alleged defect and alleged injury).


The Hazard Evaluations and Technical Assistance Branch of The National Institute for Occupational Safety and Health conducts field investigations of possible health hazards in the workplace. These investigations are conducted under the authority of Section 20 (a) (6) of the Occupational Safety and Health Act of 1970, 29 U.S.C. § 669 (a) (6) which authorizes the Secretary of Health and Human Services, following a written request from any employer and authorized representative of employees, to determine whether any substance normally found in the workplace has potentially toxic effects in such concentrations as used or found.

[It] also provides, upon request, medical, nursing, and industrial hygiene technical and consultative assistance (TA) to federal, state, and local agencies; labor; industry; and other groups or individuals to control occupational health hazards and to prevent related trauma and disease.

The HEALTH REPORT concluded that many psycho-social factors are directly related to the occurrence of CTDs. Id. at 4. See also Use of General Duty Clause in Tackling Repetitive Stress Hazards Weakened by ALJ, 22 O.S.H. Rep. (BNA) No. 43, at 1897 (Mar. 31, 1993) [hereinafter BNA Report] (noting a "disagreement within the medical community on the cause of repetitive motion injuries"); Mastalski, No. 92-1016, 1992 U.S. App. LEXIS 20730, at *20 (holding "because proof of a defect and the causation of injury are elements of a products liability claim . . . failure to prove those elements is fatal").
Next, this Comment discusses the legal requirements of a product liability suit with particular emphasis on causation. This Comment then analyzes whether causation can be proven in a CTD case, discussing in detail the courts' treatment of the issue thus far. Finally, it discusses the future effects CTDs may have on employers, employees, and the courts.

This Comment concludes that because of the current state of medical uncertainty over causation, any relief owed to CTD sufferers must come in the form of workers' compensation. Keyboard manufacturers cannot, in all fairness, be held accountable for injuries unless it can be proven that a keyboard design substantially caused such injuries. Plaintiffs should not be able to recover when various scientific studies conclude that CTDs are caused by psycho-social factors, such as stress, and ergonomic factors, such as office design, as opposed to the design of the keyboard itself.

I. Understanding CTDs

A. CTDs: What Are They and Why Are They Only Now Occurring?

Cumulative trauma disorders are injuries that result from "additive tissue damage sustained through performance of repetitive tasks." The disorder is caused by overusing the muscles and tendons of the fingers, hands, arms, and shoulders. To illustrate, tendons are similar to long pulleys that direct the movement of our fingers from within our hands and arms. If overused, these tendons can swell up and produce painful tendinitis or soreness. As the tissues become inflamed and swollen, they may press on nerves, resulting in tingling and weakness in the fingers. If left untreated, these injuries can lead to diminished coordination and strength, and possible loss of ability to grip or perform every day tasks.

Individuals in certain occupations tend to develop CTDs at a greater

7. Janice M. Horowitz, Crippled by Computers, TIME, Oct. 12, 1992, at 70. RSIs are also known as overuse syndromes, regional musculoskeletal disorders, cervical-brachial disorders, repetitive strain injuries, or repetitive motion disorders. Rempel, supra note 6, at 838.
8. Horowitz, supra note 7, at 71.
9. Id. One type of condition is myositis, which develops when muscles in the forearm that control the movement of our fingers become irritated. Id.
10. Id. Scar tissue may also develop.
11. Id. at 70. Major life necessities such as driving, cleaning, or cooking are no longer possible. It is apparent that individuals struck with a CTD may have a significant life altering condition for which there may be no cure.
rate than the general public.\textsuperscript{12} For example, meat packers are more prone to CTDs because of the "repetitive wrist extension, flexion, and thrust necessary to grip carving knives to cut through frozen meat."\textsuperscript{13} However, even a repetitive motion with minimal force, such as typing, can still cause a CTD.\textsuperscript{14} Common symptoms of CTDs include tingling, numbness, pain, and weakness in the hands, arms, fingers, or shoulders.\textsuperscript{15}

The treatment for CTDs varies and depends on the specific type of CTD.\textsuperscript{16} Nonetheless, almost all CTDs initially require rest, application of ice to the affected area, and immobilization of the joint.\textsuperscript{17} If the condition worsens, some victims receive vitamin therapy combined with exercise; others may require surgery.\textsuperscript{18} The most common types of CTDs include localized muscle fatigue and tendon-related disorders such as tendinitis, nerve entrapment syndromes, carpal tunnel syndrome, and hand-arm vibration syndrome.\textsuperscript{19}

\textbf{1. Medical Theories on the Cause[s] of CTDs}

The medical community is undecided over the cause or causes of CTDs. Barbara Silverstein, Ph.D., asserts that over time repetitive or forceful motions of the upper extremities will contribute to musculoskeletal and peripheral nervous system injuries.\textsuperscript{20} Dr. Silverstein states that "external repetitive or sustained pressure over the nerves, such as that associated with many manual tasks, can mechanically compress [the

\textsuperscript{12} Rempel, \textit{supra} note 6, at 838. Common occupations include: cashiers, data entry clerks, musicians, assemblers, reporters, postal workers, cake decorators, garment workers, sewers, buffing workers, grinders, butchers, espresso makers, electronic assembly workers, construction workers, electricians, and rock drillers. \textit{Id.} at 839.

\textsuperscript{13} \textit{Id.} at 838.

\textsuperscript{14} Horowitz, \textit{supra} note 7, at 71. Computer users are a fast-growing section of the workforce complaining of CTDs. This category includes telephone reservationists, cashiers, word processors, and journalists. \textit{Id.} at 70.

\textsuperscript{15} \textit{Id.} at 71.


\textsuperscript{17} Rempel, \textit{supra} note 6, at 841.

\textsuperscript{18} \textit{Id.} When it is determined that a job activity has caused or aggravated a CTD, job modification becomes a "crucial part of the therapeutic plan." \textit{Id.} at 839. For example, preventing "progression or recurrence of neck and shoulder disorders may require moving the visual focus of task material; wrist or hand disorders may necessitate modifying hand tool design or tool use." \textit{Id.}

\textsuperscript{19} \textit{Id.} at 839-40.

\textsuperscript{20} Silverstein, \textit{supra} note 5, at 4.
nerves]" and result in CTDs. Dr. Silverstein's study found an association between CTDs (particularly of the hand and wrist) and the industrial job attributes of force and repetitiveness. The study concluded that "job modification, a reduction in force, repetitive and/or postural stresses may result in a reduction in the prevalence of CTDs." However, the study did not address the association between computer keyboard design and CTDs, nor did it address the psycho-social factors that may contribute to CTDs. Therefore, this study does not aid CTD victims in their task of proving that a computer keyboard caused their injury; it only indicates that a repetitive motion may cause a CTD. Additionally, the Silverstein theory is not without criticism. Dr. Norton M. Hadler asserts that the Silverstein hypothesis is based on questionable underlying data. He argues that the sample size used in Silverstein's initial study was "too small to detect" CTDs from repetitive motion.

One of the most common CTDs, carpal tunnel syndrome, develops when the tendons swell due to overuse from repetitive motions. This syndrome is produced when the median nerve is compressed at the wrist. The pain often radiates proximally into the forearm and arm.

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21. Id. at 5. The nerves can be compressed several ways:
[First], [f]orceful . . . con traction of muscles causes their corresponding tendons to stretch, thereby compressing the vascular, epitendon and endotendon microstructures which in turn cause ischemia, fibrillar tearing and inflammation.
[Second], [w]here the nerves come into contact with less yielding structures than themselves, they can be compressed or entrapped. [Last], [t]he carpal canal is a compact unyielding tunnel through which the flexor tendons and median nerve pass. Inflammation of these tendons and sheaths can compress the nerve.

22. Id. at 127-28. Two groups in the study whose work involved a high incidence of force and high incidence of repetitiveness "had a significantly increased risk for all hand wrist CTDs." Id. at 112. "The high odds ratios for . . . [these two groups] suggested an interaction between repetitiveness and force. Force appeared to be a more important risk factor than repetitiveness for most hand wrist CTDs. However, repetitiveness appeared to be more important than force as a risk factor for carpal tunnel syndrome." Id.

23. Id. at 129. Dr. Silverstein discussed two steps that may help prevent CTDs: first, employers must identify high risk jobs (jobs that require forceful and repetitive motions); second, ergonomic experts must develop an ergonomic program that monitors health status.

24. Id. at 131.


26. Id. at 129. Dr. Hadler further states that no research, including the Silverstein thesis, has conclusively proven that any reasonable upper extremity usage is damaging.

swelling puts pressure on the median nerve, causing sensations of numbness, tingling and pain in the hands and wrist.”

The repetitive motions also increase pressure inside the carpal tunnel, which may decrease blood flow to the nerve and cause nerve blockage. However, if the individual tries to adopt a compensatory maneuver, the condition may worsen.

Carpal tunnel syndrome is initially treated with anti-inflammatory drugs, avoidance of the repetitive motions, and often a wrist splint. If the condition persists, corticosteroid injections may be utilized. In extreme cases, surgery is required. Carpal tunnel release surgery, one of the most frequently performed operations in the United States, involves cutting the ligaments in the wrist to relieve pressure on the median nerve. Unfortunately, however, the surgery does not always alleviate the pain or the condition. As a result, patients have a physical disability

28. DiMaggio, supra note 27, at 9. The definition of carpal tunnel syndrome is not precise in the medical community, however, diagnosis can be confirmed through symptoms, physical findings, and evidence of a median nerve conduction defect at the wrist. Rempel, supra note 6, at 840. See also Dawson, supra note 16, at 2013. Common symptoms of carpal tunnel syndrome include numbness, tingling, and pain in the hand(s). These symptoms often increase in intensity in the evening or after use of the hand(s). Unfortunately, examination in the early stages of carpal tunnel syndrome often reveals no abnormality. Id.

29. Rempel, supra note 6, at 838. “Pressure inside the carpal tunnel can increase with the wrist in extreme extension or flexion, or with high force applied to flexor tendons.” Id. DiMaggio, supra note 27, at 9. The carpal tunnel is formed by the bones in the wrist. Id.

30. DiMaggio, supra note 27, at 9. For example, a worker will often adopt a more forceful grip or an awkward position to combat the pain. Id.

31. DiMaggio, supra note 27, at 9. See also Dawson, supra note 16, at 2015 (asserting that the main types of treatment for carpal tunnel syndrome include avoidance of wrist use, a wrist splint, and anti-inflammatory medication).

32. Dawson, supra note 16, at 2015. See also Rempel, supra note 6, at 841.

33. Rempel, supra note 6, at 841. In some cases, carpal tunnel release surgery has been successful; however, no studies have been conducted to determine whether its success continues after patients have returned to their former jobs. Potential surgical complications include nerve damage, infection, scarring, postoperative pain, and stiffness. Healing requires six to twelve weeks. Id. See also Dawson, supra note 16, at 2015. Non-surgical treatments are often helpful for patients with minimal symptoms. The decision to perform surgery should only be made if the patient did not respond to splinting, steroid injections, oral anti-inflammatory medications, and after a clinical examination and nerve conduction test. Id. However, patients with acute carpal tunnel syndrome may require immediate surgery. Id.

34. See Ward v. Westinghouse Canada, Inc., 32 F.3d 1408 (9th Cir. 1994). Plaintiff was still suffering pain after surgery had been performed on both his wrists, and he had received substantial follow-up care. Id. at 1409. See also Dawson, supra note 16, at 2015. Carpal tunnel release surgery does have a good record of success:

In . . . [clinical follow-up series, the results were good to excellent in 80 percent of the patients, with 40 percent regaining normal function. The condition of 5 percent of the patients, however, worsened. Other retrospective studies report good
that makes it impossible for them to work at certain occupations. Carpal tunnel syndrome victims often have trouble doing everyday tasks such as opening a jar, buttoning a shirt, or lifting a coffee cup. Consequently, a carpal tunnel syndrome victim is often unable to resume employment that requires typing on a computer keyboard forty hours per week.

To prevent carpal tunnel syndrome and other CTDs, employers must first identify certain tasks that place employees at risk and then change, decrease, or eliminate that task. An appropriate treatment plan depends on the specific injury or injuries and the degree to which the disorder is work-related. "When a specific diagnosis of occupational risk factors has been made, and nonoccupational risk factors have been excluded, the cause of the CTD can be attributed to work activities with results in 82 percent to 98 percent of patients. Patients can return to an office job within a week of surgery, but it may be four to six months before carpenters, construction workers, or athletes can return to work. Many patients . . . need to change jobs.

If a patient does not respond to carpal tunnel surgery, it is important to verify that the distal ligament has been properly sectioned. In nearly half of such patients, the release is found to be incomplete.

Id. (citing Cseuz et al., Long Term Results of Operation for Carpal Tunnel Syndrome, 41 MAYO CLINIC. PROC. 232 (1966); Martin J. O'Malley, M.D. et al., Factors that Determine Reexploration Treatment of Carpal Tunnel Syndrome, 17A J. HAND SURGERY 638 (1992)).


36. Id.

37. Rempel, supra note 6, at 841. The following steps are taken to determine whether the injury is work related:

1. Make a reasonably specific and accurate diagnosis.

2. Exclude nonoccupational explanations for the disorder, such as rheumatoid arthritis or injury resulting from participation in athletic activity.

3. Determine whether the disorder is known to be or is plausibly associated with work. The identification of work-related risk factors is largely based on evaluation of a patient's work history. Although no single interview has been validated for collecting occupational history relative to CTDs, guidelines and standard interview instruments are available.

4. Interview the patient to find out whether risk factors are present in sufficient degree and duration to cause or aggravate the condition.

5. Determine whether a temporal association exists between the work place risk factors and the onset or aggravation of symptoms.

Id. at 839.

38. Id. at 838-39. See also Dawson, supra note 16, at 2014-15. A survey of California physicians found that 515 of every 100,000 patients sought medical attention for carpal tunnel syndrome in 1988. Of this figure, half of these syndromes were believed to be work-related. According to some experts, use of highly repetitive wrist movements, vibrating tools, and awkward wrist positions seem to be related to the syndrome. Other experts believe the cause of carpal tunnel syndrome is unknown and that factors such as age and obesity must be considered. The author concludes that more testing is greatly needed. Id. at 2014.
In May, 1989, the Hazard Evaluation and Technical Assistance Branch (HETA) of the National Institute for Occupational Safety and Health (NIOSH) conducted one of the first studies to determine whether any particular type of keyboard was associated with carpal tunnel symptoms. The study concluded there was no association between any particular type of keyboard and the reported symptoms.

In order to definitively ascertain whether computer keyboard terminals affect the health of users, the Communication Workers of America and United States West Communications jointly requested that HETA conduct a study. The purpose of the study was to discover whether the incidence of upper extremity musculoskeletal disorders and symptoms were associated with demographics, individual factors, work practices, work organization, or psycho-social aspects of work.

The HETA study revealed a negative relationship between typing skill and the occurrence of carpal tunnel syndrome; a negative relationship between hours spent at the computer terminal and carpal tunnel syndrome occurrence; and no relationship between the total number of key strokes per day and upper-extremity disorders of any kind. However, the study did find a positive relationship between the incidence of upper-extremity disorders and other factors such as job insecurity, work pres-

39. Rempel, supra note 6, at 839. If a disorder is attributed to a work activity, this activity must be modified to become a part of the patient’s therapeutic plan. Id.


41. Id. This report concluded that CTDs have a “multi-factorial causality” and usage is only one unsubstantial cause. Furthermore, ergonomic changes in the workplace have not succeeded in lowering the number of CTDs. Id.

42. Id. at 33; HEALTH REPORT, supra note 5, at 5.

43. Chesler, supra note 40, at 33. The study included United States West employees and other employees who use computers for at least six hours per day. Id.; see also HEALTH REPORT, supra note 5, at 5. A cross-sectional study of 533 workers from five distinct job titles employed within three urban areas was conducted. These areas included Phoenix, Minneapolis/St. Paul, and Denver. Id. at 2. “The examination consisted of inspection, palpation, passive movements, resisted movements, and a variety of maneuvers to define upper extremity musculoskeletal conditions standardized through its use in other NIOSH evaluations. Four physicians were trained to administer the upper extremity examinations and were blinded to the individual’s questionnaire responses.” Id. at 6. When employees become aware of the CTD phenomena they are more likely to attribute any pains they experience to work-related activities; if they are not aware of the potential CTDs involved with their job, they are more likely to discover other sources for their pain. Id. at 16.

44. HEALTH REPORT, supra note 5, at 19-20; Chesler, supra note 40, at 13-14.
sure, boredom, and surges in work load.\textsuperscript{45} Although the HETA study strengthens Dr. Norton’s theory, it has not been universally praised.\textsuperscript{46} HETA itself acknowledged the uncertainty of the findings because of the study’s inability to distinguish cause from effect. It questioned, “[a]re concerns about job security causing musculoskeletal disorders, or are concerns over job security due to having a musculoskeletal disorder?”\textsuperscript{47}  

2. A Recent Phenomenon?  

Many employers question why this CTD crisis has only recently developed. The answer is simple: “[t]oday, forty-six million people use computers on the job, compared to 675,000 in 1976.”\textsuperscript{48} By the year 2000, an estimated seventy-five percent of all jobs will involve the use of computers.\textsuperscript{49} Prior to the use of computers, persons using typewriters stopped typing periodically to add paper, erase mistakes, return the carriage, or replace the ribbon.\textsuperscript{50} These activities are now performed automatically by computers.\textsuperscript{51} Additionally, people are typing faster than ever before; a six-hour work schedule can often mean 72,000 keystrokes on a daily basis.\textsuperscript{52} Some computer designers claim the key location must

\textsuperscript{45} \textit{Health Report}, \textit{supra} note 5, at 20-21. “Fear of being replaced by computers was associated with four disorders (neck, shoulder, elbow, and any upper extremity), and uncertainty about the job future was associated with increasing symptoms in three areas (neck, elbow, hand/wrist).” \textit{Id.} at 20. Additionally, work pressure was associated with neck and upper extremity disorders and shoulder, elbow, and hand/wrist symptoms. “[R]outine work lacking decision making opportunities was associated with increasing elbow and hand/wrist symptoms, and neck disorders.” \textit{Id.} at 21. Last, “[t]he lack of a productivity standard was a risk factor for neck disorders.” \textit{Id.} at 3. Seven psycho-social aspects have a link to upper-extremity CTDs: “fear of being replaced by computers, jobs which required a variety of tasks, increasing work pressure, lack of a production standard, lack of job diversity with little decision making opportunity, high information processing demands, and surges in workload.” Also associated with degree of upper extremity symptoms were “uncertainty about one’s job future, lack of co-worker support, and lack of supervisor support.” \textit{Id.}  

\textsuperscript{46} Chesler, \textit{supra} note 4, at 23. Expert Carla Springer found the survey to be inconclusive. She criticized the \textit{Washington Post} for reporting that the study linked job stress to video display terminal physical injuries. Dr. Springer argued that most of the independent variables examined by NIOSH investigators accounted for only one to two percent of the variance of the occurrence of symptoms; therefore, the study’s predictability was not persuasive. \textit{Id.}  

\textsuperscript{47} \textit{Health Report}, \textit{supra} note 5, at 20-21.  

\textsuperscript{48} DiMaggio, \textit{supra} note 27, at 9.  

\textsuperscript{49} \textit{Id.}  

\textsuperscript{50} \textit{Id.}  

\textsuperscript{51} \textit{Id.}  

\textsuperscript{52} \textit{Id.}
be changed to prevent CTDs. Ninety-nine percent of Americans type on the QWERTY keyboard, this keyboard was originally fashioned to delay key movement so the keys didn’t stick together. The newly developed DVORAK keyboard reduces wrist movement by locating the most frequently used keys near the center of the keyboard. Although altering the keyboard design may be instrumental in reducing CTDs, Americans may not respond well to it because it would require them to re-learn how to type.

B. Ergonomics: A Possible Solution

Ergonomics is the study of equipment designed to reduce workplace injuries. Representative Tom Lantos, chairperson of the House Government Operations Subcommittee on Employment and Housing, called ergonomics the “science of making the job fit the worker, and not the worker fit the job.” Ergonomics involves installing certain types of equipment and following certain guidelines to ensure worker safety. To improve worker safety, equipment such as chairs, keyboards, and wrist supports have been designed or re-designed to provide maximum safety from CTDs.

1. Government Action

The San Francisco City Council was the first governmental body to pass an ergonomics law designed to prevent computer-related CTDs. The law requires all employers with fifteen or more employees to provide fifteen minute breaks every two hours for computer users. The law also

54. Id. This information was based on reports by a Tokyo-based consortium of universities and companies.
55. Id.
56. Ninety-nine percent of Americans know how to type on a QWERTY keyboard. Id.
57. Jeffrey G. Huvelle & Michael G. Michaelson, Stiff Wrists at Work Mean Stiff Fines For Many U.S. Businesses, LEGAL TIMES, Feb. 12, 1990, at 24. Ergonomics is from the Greek word ergon, meaning work. Id.
58. Id.
59. Horowitz, supra note 7, at 72. Some companies have implemented ergonomic computer programs that periodically flash “take a break” reminders, others have re-designed chairs, tables, and lighting fixtures. Additionally, voice-activated computers have been designed to combat CTDs. Id.
60. DiMaggio, supra note 27, at 9.
61. Id.
requires various standards for proper seating, lighting, and workstations. However, in *C & T Management Services, Inc. v. City and County of San Francisco*, the California Superior Court invalidated the ordinance as it applied to private places of employment because such safety laws can only be created by the state Occupational Safety and Health Standards Board. However, noting the importance of the law, the Occupational Safety and Health Standards Board plans to adopt ergonomic standards in the workplace designed to reduce the instances of injury from repetitive motions.

2. Private Business' Action

Some businesses already have made costly ergonomic alterations to their offices. For example, *Newsday* invested $1.2 million in office furnishings, $300,000 in consultants, and $350,000 in management and staff education after employees filed a total of $400,000 in workers' compensation claims relating to carpal tunnel syndrome in one year. United

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62. *Id.*


64. *Appeals Court Rejects S.F.'s VDT Safety Law*, S.F. CHRON., Aug. 7, 1993, at B5 (West Bay ed.). The two companies that brought the suit, Zack Electronics and Data Processing & Accounting Services, were financially backed by IBM Corporation. *Id.* The case was affirmed on appeal. *Id.*

65. CAL. LAB. CODE § 6357 (West 1995).

66. DiMaggio, *supra* note 27, at 9; see Chesler, *supra* note 40, at 30 (asserting that ergonomic changes should not be made until it can be medically proven that CTDs are caused solely by repetitive motions).

67. DiMaggio, *supra* note 27, at 9; see also Horowitz, *supra*, note 7, at 70. According to ergonomic experts each part of the body should maintain a particular position as to each piece of equipment:
   - Head: Directly over shoulders, without straining forward or backward, about an arm's length from screen.
   - Neck: Elongated and relaxed.
   - Shoulders: Kept down, with the chest open and wide.
   - Back: Upright or inclined slightly forward from the hips. Maintain the slight natural curve of the lower back.
   - Elbows: Relaxed, at about a right angle.
   - Wrists: Relaxed and in a neutral position, without flexing up or down.
   - Knees: Slightly lower than the hips.
   - Chair: Sloped slightly forward to facilitate proper knee position.
   - Screen: At eye level or slightly lower.
   - Fingers: Gently curved.
   - Keyboard: Best when kept flat (for proper wrist positioning) and at or just below elbow level. Computer keys that are far away should be reached by moving the entire arm, starting from the shoulders, rather than by twisting the wrists or straining the fingers. Take frequent rest breaks.
   - Feet: Firmly planted on the floor. Shorter people may need a footrest.
States West spent two million dollars for ergonomic furnishings, two million dollars for medical treatment for CTDs, and one million dollars for professional consultants and lawyers. Thus, some businesses are investing substantial capital in ergonomic equipment in an attempt to reduce rising workers' compensation claims.

In addition, the Department of Labor's Occupational Safety and Health Administration (OSHA) published its intention to issue ergonomic regulations by 1995. Due to the increasing cost of workers' compensation and the future compliance with OSHA regulations, employers must begin to maintain ergonomically correct offices.

II. The Workers' Compensation Arena and OSHA Regulations

Once it is determined that the injury was caused by the normal performance of work-related tasks, the employee is often entitled to workers' compensation benefits. Upper-extremity CTDs account for approximately 3.5% of the 465 billion dollars spent on workers' compensation claims. With the average cost of benefits for a carpal tunnel syndrome patient at $29,000 per year, occupational CTDs are the most costly per-case category of workers' compensation.

The employee's right to compensation for a work-related CTD is enforced through fifty independent state agencies and three federal agencies because of differences in both the substantive provisions and the varied administrative procedures utilized by each of these agencies, generalizations may mask wide variations. However, all workers' compensation systems make the employer strictly liable to its employees for work-related injuries, commonly described as "accidents arising out of and in the course of employment." Therefore, employees who develop CTDs can apply for workers' compensation if they can

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68. DiMaggio, supra note 27, at 9. United States West employs telephone operators who use computers in the course of their employment. Id.
70. Rempel, supra note 6, at 839.
71. Mandelker, supra note 1, at 28. Five industries particularly hit hard by CTDs include supermarket cashiers, meat packers, newspaper employees, cashiers, specialty glass workers, and poultry workers. Id. at 29.
72. Id. at 28-29. This figure covers medical treatment, lost time benefits, and a settlement if the worker is totally or partially disabled. Id. at 28.
link their injuries to their employment. 73

A commonly asked question is why computer users would sue manufacturers when they can receive workers’ compensation. One reason is that workers’ compensation payments are not easily obtained or may be inadequate. 74 Workers’ compensation is often deficient in three respects: (1) the process is time consuming, and a worker may be without a salary until the claim settles; (2) the amount of compensation an employee receives is rarely equal to the amount he or she received while working; (3) causation is often difficult to prove, especially with permanent disabilities; and (4) the victim may have a need for additional compensation. 75

Typically, workers’ compensation proceedings begin with the employee notifying the employer, the appropriate agency, or both, of an injury. Failure to give notice in the time specified by the applicable law—“immediately,” “as soon as practicable,” and “within 30 days” are three of the most commonly used statutory phrases—may bar the employee from claiming benefits retroactively to the date of the injury, or from filing a claim later. The second step is filing a claim with the agency, for which there is a much longer time limit—commonly one or two years. If the employer or its insurance carrier contests the claim, it will be set down for a hearing before an administrative law judge, referee or arbitrator employed by the agency, who will then issue an award. This award may be appealed administratively to a board or commission, whose decision is subject to judicial review. 76

73. Clyde Summers, Effective Remedies For Employment Rights: Preliminary Guidelines and Proposals, 141 U. PA. L. REV. 457, 514 (1992). Three federal plans cover all worker compensation claims for their respective groups: (1) District of Columbia covers all employees in the District of Columbia; (2) a federal plan covers all employees of the federal government; and (3) a federal plan covers longshore and harbor workers. Id. at 514 n.364. “The employer is liable for all medical costs and must pay statutorily prescribed benefits for physical disability, loss of earnings, and death. The employer can also be liable for costs of rehabilitating the injured worker to employability.” Id. at 515. Rempel, supra note 6, at 839. Physicians often determine “whether a temporal association exists between the work place risk factors and the onset of aggravation of symptoms.” Id. Therefore, the physician commonly provides the link between the patient’s injury and his/her employment.

74. See Summers, supra note 73, at 514-23 (detailing workers’ compensation procedures and deficiencies).

75. Id.

76. Id. at 515; see, e.g., CAL. LAB. CODE § 5400 (West 1992) (“within 30 days”); GA. CODE ANN. § 34-9-80 (Michie 1992) (“immediately” or “as soon thereafter as practicable”); IDAHO CODE § 72-701 (1992) (“as soon as practicable but not later than sixty (60) days”).
During the time an employee is disabled, "weekly benefits . . . are computed at two-thirds of the injured employee's prior average wage, with a maximum weekly benefit based on the state's average weekly wage." Consequently, employees who earn higher wages than the state average will be awarded less. Furthermore, employees with permanent disabilities may, after several years, receive only a fraction of their actual wage loss due to inflation or the normal lifetime earnings curve. Therefore, individuals who receive workers' compensation for their disabilities often have additional reasons to bring product liability actions against the manufacturers of the products that allegedly caused their injuries.

Prior to July, 1993, OSHA prosecuted employers for failing to eliminate CTDs from the workplace under the assumption that the failure violated the "general duty" clause of the Occupational Safety and Health Act. The "general duty" clause provides that an employer must furnish a place of employment "free from recognized hazards that are causing or are likely to cause death or serious physical harm." However, an employer's "general duty" is not always clear when used in reference to CTDs. Consequently, an ergonomics standard is needed in order to properly instruct employers on how to maintain a safe working environment.

Accordingly, in Secretary of Labor v. Pepperidge Farm Inc., an Occupational Safety and Health Commission judge ruled that OSHA could no

77. Summers, supra note 73, at 518. This two-thirds loss in wages is a deliberate attempt to encourage the employee to return to his or her employment. The effect of this reduction in wages is to punish employees who are genuinely injured. Id.

78. Id.

79. Id. at 519. The lifetime earnings curve is the average rate at which an individual would receive raises or other types of increased compensation from employers. Id.

80. Huvelle & Michaelson, supra note 57, at 24; BNA Report, supra note 5, at 1897.


82. See David J. Kolesar, Cumulative Trauma Disorders: OSHA's General Duty Clause and the Need for an Ergonomics Standard, 90 MICH. L. REV. 2079, 2090-2102 (1992) (arguing that ergonomic standards better suit the employee and employer by providing a clear standard and equitable relief). In order to prove a general duty violation, OSHA must establish four factors: (1) the employer has failed to "free" its workplace of a hazard; (2) the hazard is "recognized"; (3) the hazard could have been materially reduced or eliminated by a feasible means of abatement; and (4) the hazard is "causing or likely to cause death or serious physical harm." Id. at 2090.

Because the exact cause(s) of CTDs is unknown, it is also unclear how to prevent them. Without this information, the second and third requirements of the "general duty" clause are not met, and therefore the "general duty" clause cannot be used. Thus, by using the "general duty" clause to prosecute CTDs, OSHA is not utilizing the clause as it was intended and is refraining from the extensive job of adopting an ergonomics standard. Id.

longer use the general duty clause to force abatement of repetitive stress hazards.\textsuperscript{84} In that case, OSHA alleged that Pepperidge Farm willfully provided a working environment that was conducive to CTDs.\textsuperscript{85} The administrative law judge dismissed the 175 citations issued by OSHA because there was too much disagreement among the medical community as to the cause of repetitive motion injuries.\textsuperscript{86} The administrative law judge further ruled that OSHA could not require an employer to minimize repetitive stress hazards when the agency itself has failed to promulgate a federal ergonomics standard.\textsuperscript{87} Therefore, until OSHA developed an ergonomics standard, employers had no clear guidance from the federal government as to what constituted an ergonomically correct work environment.

III. \textbf{Legal Requirements of a Product Liability Suit Brought under a Theory of Negligence}

A product liability suit may be brought under several theories: strict liability in contract for breach of a warranty; liability in contract for breach of an express or implied warranty; negligence liability in tort; and strict liability in tort.\textsuperscript{88} Plaintiffs in CTD cases are most likely suing for personal injuries they have sustained and, therefore, are more likely to sue under a strict liability or a negligence action in tort. In order to succeed in a strict liability action, the plaintiff must prove the product was unreasonably dangerous. Because it is more difficult to prove a computer keyboard is unreasonably dangerous, it is more likely that a plaintiff will bring suit under a negligence cause of action.

A plaintiff must prove four factors to succeed in a negligence action.\textsuperscript{89}

\begin{itemize}
\item \textsuperscript{84} \textit{BNA Report}, supra note 5, at 1897. OSHA reported that until it decides whether or not to appeal this case, all OSHA policies are in effect and complaints involving ergonomic hazards will be investigated despite the lack of an ergonomics standard. \textit{Id.}
\item \textsuperscript{85} \textit{Pepperidge Farm Cleared in Repetitive Motion Case}, \textit{Legal Intelligencer}, Mar. 30, 1993, at 5. "OSHA claimed that assembly line workers were prone to repetitive motion injuries caused by tasks like capping, where two halves of a cookie are clamped over chocolate filling, and denesting, where stacks of thin paper cups are placed one by one on a conveyer belt." \textit{Id.}
\item \textsuperscript{86} \textit{Id.}
\item \textsuperscript{87} \textit{BNA Report}, supra note 5, at 1897.
\item \textsuperscript{88} W. PAGE KEETON ET AL., \textit{PROSSER AND KEETON ON THE LAW OF TORTS} \textsection 95, at 678 (5th ed. 1984). Product liability involves the liability of "those who supply goods or products for the use of others to purchasers, users, and bystanders for losses of various kinds resulting from so-called defects in those products." \textit{Id.} \textsection 30, at 677.
\item \textsuperscript{89} \textit{Id.} \textsection 30, at 164-65.
\end{itemize}
First, the plaintiff must prove the defendant had a duty to society. The law imposes a duty on individuals to conform their behavior to a certain standard of conduct, thereby preventing others from being hurt by "unreasonable risks." Second, the plaintiff must prove that the defendant breached this duty by failing to conform to a reasonable standard of conduct. A person's actions are evaluated according to what is fair. Fairness requires that in order to hold a person liable for harm, that harm must have been reasonably foreseeable. Negligence occurs when a person foresees unreasonable risk and fails to take reasonable steps to avoid such risk, thereby violating his or her duty. In order to determine whether a duty has been breached, courts will consider whether a reasonably prudent person would have acted similarly under identical circumstances. The third factor a plaintiff must prove is that the defendant's breach caused the injury. In order to prove causation, the plaintiff must prove that the defendant's act or omission was a necessary antecedent to the plaintiff's injury. In other words, the plaintiff must prove that, but for the defendant's act or omission, the plaintiff would not have been harmed. The fourth and final factor the plaintiff must prove is that injury occurred as a result of the defendant's negligence.

In the typical CTD negligence action involving computer keyboard operators, the plaintiff must prove that a keyboard manufacturer owed a duty of care to users of its product. In addition, such a CTD plaintiff must prove that the computer manufacturer had notice and/or knowledge, or reasonably should have known that the keyboard was causing harm. Although, at this time, most CTD cases are currently in the discovery phase, many plaintiffs have attempted to prove that computer companies had notice of keyboard related CTDs by subpoenaing the following documents: workers' compensation forms involving the company's

90. Id. § 30, at 164.
91. Id. § 30.
92. Id.
93. Id. § 31, at 170.
94. Id. § 31.
95. Id. § 30, at 164.
96. Id. § 32, at 174-75.
97. Id. § 30, at 165.
98. Id. § 41, at 264-65.
99. Id. § 41, at 266.
100. Id. § 30, at 165.
101. A key question in determining whether a duty existed is whether the harm was foreseeable, i.e., whether the defendant had knowledge and/or notice of the potential harm. Id. § 32, at 182.
CTDs in the Workplace

own computer-using employees' CTD claims; company documents describing keyboard design and related equipment; documents dealing with the relationship between keyboard use and CTDs; documents pertaining to human factors or ergonomics as they relate to either keyboards or CTDs; information detailing the cost to companies of worker's compensation suits filed against them alleging CTD or keyboard use; and, depositions of keyboard-using employees who suffer from CTDs and workers with knowledge about record keeping and reporting. Thus far, all but one court has held these documents to be discoverable. Consequently, it does not appear that plaintiffs will have great difficulty proving that computer companies were aware of potential health hazards surrounding computer keyboard use.

The second element that a CTD plaintiff claiming computer company negligence must prove is that the computer companies breached their duty of care by not re-designing the keyboard or placing a warning on it. Plaintiffs may be able to prove that computer company was aware of the potential for CTD problems in general, but must they also prove that the computer company knew that their computer keyboard design was a possible source of the problem? The answer appears to depend on whether a reasonably prudent person and/or company would re-design a keyboard that has been utilized for decades by the public, when he or she, in good faith, did not believe the keyboard to be the cause of the harm. This issue is arguable because a plaintiff may be able to prove that a defendant had knowledge of workers' compensation claims for CTDs caused by keyboard use, thus justifying action on behalf of the reasonably prudent person and/or company.

The third, and most difficult, factor for a CTD plaintiff to prove is causation. It is difficult to prove because the medical community is uncertain as to what causes a CTD. Additionally, studies have suggested that psycho-social factors contribute to CTDs. Plaintiffs have the burden of proving that it is more likely than not that the design of the keyboard was a cause of their injury. Mere speculation is not enough, and if the evidence is equally balanced, a directed verdict for the defendant will fol-

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103. See Bost-Manuel, Nos. 499000/93, 21784/92, 14003/93, 1994 WL 87529 (holding that the requested discovery documents were not subject to discovery).
Because of the medical uncertainty surrounding the cause of CTDs it is extremely difficult to prove that a keyboard design caused an injury. Moreover, if it is determined that a number of factors contribute to CTDs, such as the rate of typing, poor posture, or psycho-social factors, it is very difficult to pinpoint the degrees of harm caused by the keyboard.

IV. CTDs March into the Product Liability Courtroom

It is predicted that "thousands or tens of thousands" of CTD product liability claims will be filed in United States courts in the future. In *Burroughs v. Northern Telecommunications, Inc.*, the United States District Court for the Eastern District of New York consolidated in one court all the CTD cases in that district. The plaintiffs in *Burroughs* are computer operators, adding machine operators, supermarket checkout workers, and other users of mechanical and electrical devices. Defendants include many well-known international computer companies. The outcome of this case will have a substantial effect on the future success of CTD cases in our court system. CTD cases may create the same crippling effect on judicial dockets that asbestos cases did in the late 1970s and 1980s.

107. *Id.* at 588. The cases are now consolidated in a class action suit before Judge Hurley of the United States District Court for the Eastern District of New York. *Id.* The plaintiffs contended that consolidation is appropriate because their cases "represent the vanguard of what will be related mass litigations against numerous manufacturers and employers for these occupational injuries." *Id.* at 584. The defendants contended that consolidation would result in rising costs because all attorneys will have to attend every disposition and court appearance. *Id.* at 585. Additionally, defendants opposed consolidation because a CTD is not an identifiable condition, "but is instead a label for a variety of symptoms whose cause and treatment vary substantially and which ought to be handled separately." *Id.* at 585. The court consolidated the cases primarily because the cases are still in their infancy. The court stated, "[c]ourts do not always have the opportunity to coordinate their efforts to process a related mass of cases at this stage. The late stage at which the asbestos cases were consolidated was a major factor contributing to the great expense of that litigation." Now a "pooling of knowledge" can be achieved and expenses can be minimized. *Id.* at 587.
108. *Id.* at 584.
109. *Id.* The defendants included Apple Computer, AT&T, NCR Corporation, IBM, C. Itoh, Panasonic, Memorex Corporation, Northern Telecommunications, Quizote, Wang Laboratories, Atex, and Eastman Kodak. *Id.*
1990s will depend on whether plaintiffs can prove causation. Several courts have expressed reluctance to accept the plaintiffs' causation theories.

A. Judicial Reluctance in Recognizing The Causation Factor

The plaintiff in a product liability suit has the burden of producing evidence "which affords a reasonable basis for the conclusion that it is more likely than not that the conduct of the defendant was a cause in fact of the result." If resolution of the causation issue requires special knowledge beyond the grasp of the average juror, the plaintiff must produce satisfactory expert testimony.

Because there is no consensus in the medical community as to what causes a CTD, courts may be reluctant to hear CTD cases. The Administrative Law Court in Secretary of Labor v. Pepperidge Farm, Inc., did little to clear up this quandary. There, the court held that OSHA could no longer use the "general duty" clause to force abatement of repetitive stress hazards and dismissed all citations against the company. Despite its loss, OSHA claimed the Pepperidge Farm case was a positive step for CTD victims because the judge held that repetitive stress injuries were caused by workplace conditions. However, the court did acknowledge in its opinion that "significant disagreement existed within the medical community on the cause of repetitive stress injuries." Consequently, this opinion can be construed as a victory for CTD victims because it substantiated the theory that CTDs are caused by work place conditions, but it can also be construed as a victory for defendants because the opinion noted the lack of consensus in the medical community on the issue of causation.

The judiciary is reluctant to recognize causation in CTD cases because of the medical uncertainty. In Mastalski v. IBM, Mastalski, an em-

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111. Id. at 26.
112. See generally id. at 24-26 (discussing CTD cases that have failed, in part, because of the plaintiff's inability to prove causation).
113. Keeton et al., supra note 88, § 41, at 269.
114. Id.
115. Id.
117. BNA Report, supra note 5, at 1897.
119. BNA Report, supra note 5, at 1897.
ployee of the Butterick Company, brought suit against IBM, alleging that work equipment sold by IBM to her employer caused injury to her right arm. The plaintiff worked with the IBM 3742, a data processing machine that stands independently and contains two stations, each with a keyboard and a shared computer display screen. The plaintiff used the machine for twenty-six months. The plaintiff alleged that, in 1987, she suffered permanent injury to her ulnar nerve, which is located above the elbow, from operating the IBM 3742. She sued on three separate causes of action:

The claim based on strict liability in tort alleged that the product was unreasonably dangerous because it was defectively manufactured, designed, assembled and constructed, and also was defective because of inadequate warnings. The claim based on negligence alleged that IBM failed to use reasonable care in designing, manufacturing, constructing and assembling the product, and also in failing adequately to warn users against special dangers created by use of the machine.

The third claim, based on breach of warranty, was dismissed because it was barred by the statute of limitations. The plaintiff alleged that the product's defects and IBM's negligence caused her permanent disabling injuries, including right ulnar nerve neuropathy, a partially frozen right shoulder, and repetitive stress syndrome. IBM moved for summary judgment claiming that: (1) plaintiff never identified any defects in the product's design or manufacture; (2) she failed to identify any causal link between the alleged defect and the alleged injury; (3) she failed to offer facts showing that the product was unreasonably dangerous and defective; and (4) plaintiff failed to identify experts as required by the court's scheduling order.

121. Id. at *3.
122. Id.
123. Id. at *4. Plaintiff had previously worked for a year and three quarters as a data processor for Delta Computers, Inc. Although plaintiff used the same computer at Delta Computers that she used at the Butterick Company, she never complained of pain while an employee of Delta. At Butterick, while maintaining 18,500 keystrokes per hour, she first complained of pain in April, 1987. Id. at *4-5.
124. Id. at *6.
125. Id. at *5-6.
126. Id. at *2.
127. Id. at *6. The plaintiff's first symptoms included pain, numbness, and tingling in her right arm and hand. Id. at *5. A surgical procedure called an ulnar nerve transposition was performed, but plaintiff claims that it failed to alleviate her pain. Id.
128. Id. at *2. The plaintiff is receiving workers' compensation benefits from her employer, the Butterick Company of Altoona, Pennsylvania. Id. at *5.
In response, the plaintiff offered the expert testimony of Nachman Halpern, who concluded that the machine was defectively designed. Mr. Halpern argued that the placement of the display screen, the flatness of the keyboard, the height of the work surface, lack of sufficient wrist support, and the steep angle of the keyboard with the layout of the keys made the machine's design defective. These defects required the plaintiff to be in an "awkward" position, the consequence of which was a "substantial factor" in causing the plaintiff's injuries. The court did not find Halpern's opinions persuasive because they were not supported by any medical or clinical evidence. Consequently, it granted IBM's motion for summary judgment.

The court stated that the theory of strict liability requires proof that the allegedly defective product is "unreasonably dangerous" and the alleged defect caused the plaintiff's injuries. The judge decides as a matter of law whether a product may be labeled "unreasonably dangerous." The court determines "whether the alleged defect is a design defect, a manufacturing defect, or a failure to provide adequate warnings." In order to determine whether a design defect existed in the IBM 3742 the court would need to consider:

[T]he usefulness of the product to the user and public; the likelihood it will cause injury and probable seriousness of any injury; availability of substitutes to meet the same need that are less unsafe; the maker's ability to eliminate the unsafe features without making it too expensive or impairing its utility; ability of user to avoid the danger by exercising care in use of product; general knowledge as to dangers inherent in use of the product, or existence of adequate warnings; ability of maker to spread loss through price of the product or liability insurance.

The court was unable to consider the above factors because the plaintiff did not bring forth adequate evidence to do so.

129. Id. at *6.
130. Id. The plaintiff relied solely on her expert's opinion despite knowing that IBM had conducted a deposition "which severely discredited the basis of his opinions" by pointing out that he had no medical studies or proof supporting his views. Id. at *18.
131. Id. at *6.
132. Id. at *21.
133. Id. at *20.
134. Id. at *8 (citing RESTATEMENT (SECOND) OF TORTS § 402A (1984)).
135. Id.
136. Id.
137. Id. at *6 n.2.
138. Id. at *18. IBM moved for summary judgment claiming there was no evidence as
A court "may grant a motion for summary judgment if the only evidence to support the claim is an expert’s theory of injury that has no basis in the record." Mastalski submitted only Halpern’s opinion as evidence to support her claim that the product was unreasonably dangerous due to a design defect. Halpern did not identify any studies or clinical data that would support his theory that the position the plaintiff maintained while working, combined with the design of the machine, damaged her ulnar nerve. The court dismissed Halpern’s opinions as "speculation that was unsubstantiated by any factual evidence in the current medical literature or the record." Halpern also claimed that plaintiff’s injury was caused by the hourly typing rate and the amount of typing required by her employer. The court rejected this argument, stating that "[a]n injury resulting from a requirement to maintain long hours and a fast pace would be more akin to harm from the overconsumption of an otherwise relatively safe and non-defective product, such as a tennis racquet." Summary judgment was granted because Halpern’s conclusion that the alleged design defect was a substantial factor in plaintiff’s injury “was insufficient as a matter of law to establish that the IBM’s workstation’s design was defective and thus unreasonably dangerous.”

139. Id. at *19.

140. Id. at *20.

141. Id. The plaintiff did not put forth any medical evidence supporting her theory. Additionally, Halpern acknowledged at his deposition that he had "no medical literature or data to support his hypotheses, but that he extrapolated from studies conducted on other parts of the body, such as the shoulder, to opine as to what may have caused the injury to Mastalski’s elbow. Id.

142. Id. at *21.

143. Id. at *20.

144. Id.

145. Id. at *22. The court stated that:

[although it may well be that, in the future, scientific studies may become available that would suggest a link between the design of the workstation and the injury, any attempts at the efficient administration of justice would be futile were we to require district courts to hold off on deciding a motion for summary judgment merely because of a plaintiff’s hope that additional scientific research will become available by the time of trial.

Id. at *21-22.
B. Overcoming the Statute of Limitations

In Ward v. Westinghouse Canada, Inc., air46 an airline reservation clerk brought an action against manufacturers and distributors of a computer system he used during his employment, alleging that it caused him to develop repetitive stress injuries and emotional distress.147 Employed as a reservation clerk from 1979 to 1990, the plaintiff first noticed pain in his wrists in 1984.148 He was diagnosed with carpal tunnel syndrome in 1989.149 He reported his symptoms to his supervisor on October 4, 1989, and filed suit on October 16, 1990.150 Because Ward's complaint was primarily for personal injury, his claim was governed by a one year statute of limitation.151 The district court ordered his action barred because Ward suffered "appreciable and actual harm" by September of 1989 and failed to bring suit within one year.152 However, the United States Court of Appeals for the Ninth Circuit reversed, holding that "under the California delayed discovery rule, 'the actual date of a cause of action is delayed until the plaintiff is aware of her injury and its negligent cause.'"153 The appellate court stated the issue as whether "a reasonable person in his position, knowing or suspecting that using a keyboard was the source of his trouble, would have been on inquiry notice of 'wrongdoing.'"154 This, the court held, is a factual issue for the jury, therefore the granting of summary judgment was erroneous.155

The United States District Court for the District of Arizona in Ramirez v. Computer Consoles, Inc.,156 ruled that seventeen employee causes of action were barred by Arizona's two-year statute of limitations.157 The court accepted the defendant's argument:

The defendant ... Computer Consoles, Inc. (CCI), argued that 17 of the plaintiffs' product liability claims were barred by the

146. 32 F.3d 1408 (9th Cir. 1994).
147. Id. at 1408. The plaintiff alleged he developed "crippling tendonitis, a type of cumulative trauma disorder." Id.
148. Id.
149. Id. The plaintiff informed the doctor that the cause of his injury was "unknown."
150. Id.
152. Ward 32 F.3d at 1406-07.
153. Id. at 1407 (citations omitted).
154. Id. at 1407-08. The court further found that the plaintiff's request for workers' compensation did not necessarily indicate he was aware of wrongdoing. Id. at 1408.
155. Id. at 1408.
157. Id. at 2.
Arizona two-year statute of limitations because the plaintiffs had failed to file their actions against CCI within two years of developing their own personal conclusions that working at computer keyboards manufactured by CCI had caused them CTDs. CCI, of course, disputed the underlying causation hypothesis. Nonetheless, relying upon workers' compensation forms filed by the plaintiffs, their treating physicians, and their employer (U.S. West), CCI argued the plaintiffs knew everything they needed to know in order to be able to sue CCI more than two years before the lawsuits were filed.\(^\text{158}\)

Therefore, for a CTD plaintiff to succeed in his or her product liability suit he/she must overcome not only judicial resistance to the causation aspect of the claim but also a relatively short statute of limitations.

V. CUMULATIVE TRAUMA DISORDERS' EFFECT ON BUSINESSES

The large number of workers' compensation claims brought each year for CTDs indicates that changes are needed to avoid these injuries. Workers' compensation does not always provide an adequate remedy for many injured workers. Moreover, CTDs are depleting workers' compensation programs.

*Pepperidge Farm* was a positive step because it caused OSHA to begin implementation of ergonomic standards.\(^\text{159}\) Additionally, the Clinton Administration has announced plans to propose workplace ergonomic standards in the future.\(^\text{160}\) Perhaps through early and effective prevention, either through ergonomic changes and/or psycho-social changes, the wave of product liability CTD cases may be avoided.

The debate over causation remains controversial because of various findings that link CTDs to psycho-social factors.\(^\text{161}\) For example, almost every one of the seventy copy editors at the *Philadelphia Inquirer* and *Philadelphia Daily News*, who must edit all of the newspapers' articles by the printing deadline, suffer from carpal tunnel disorders, compared with an overall rate of thirty percent in the newsroom.\(^\text{162}\) This example implies that stress and/or work pressure contributes to CTDs. Therefore, the more factors that are linked to CTDs, the less success plaintiffs will

\(^{158}\) Id.

\(^{159}\) Mandelker, *supra* note 1, at 30.

\(^{160}\) Salwen, *supra* note 69, at B5.

\(^{161}\) See generally *Health Report*, *supra* note 5, at 23 (finding a positive correlation between psycho-social factors and CTDs).

\(^{162}\) Mandelker, *supra* note 1, at 30. The pressure on copy editors is much more intense because of the strict, relatively short deadlines they are faced with each day.
have in proving a keyboard design caused their injuries. However, the
answer to the causation question can properly be resolved only by medi-
cal professionals. Unfortunately, efforts at doing so have been "ham-
pered by a lack of consensus on diagnostic criteria" and some experts
maintain that "the causes of [CTDs] in the workplace are not yet
known."163

VI. CONCLUSION

CTDs continue to drain workers' compensation budgets and burden
our courts with product liability claims. Ergonomic changes are the wave
of the future; however, they may not be enough to avert the many
problems posed by CTDs because the cause of CTDs is not yet known.
Nonetheless, in order to avoid workers' compensation claims, possible
tort suits, and future OSHA prosecutions, employers must implement
ergonomic changes.

The Burroughs case may provide answers to the controversial causa-
tion issue. However, unless medical experts can determine what causes
CTDs, the plaintiffs in that case will not receive the relief they desire.
Causation must be proven, whether plaintiffs bring a claim based in negli-
gence or strict liability. Causation will be difficult to prove because stud-
ies thus far have pointed to various psycho-social factors as contributors
to CTDs. Regardless of the cause, CTDs are lowering worker productiv-
ity and disabling many individuals; a solution to the disorder is needed.
However, until a cause can be pinpointed, computer manufacturers
should not be held liable for CTDs.

Theresa A. Cortese
