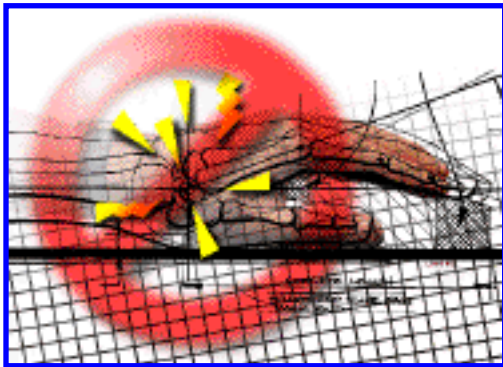# "So How Are Your Hands?"

Thoughts From A CS Student With RSI

by [Rob Jackson](#)

About RSI

Computer-related Repetitive Strain Injury (RSI) has received a lot of attention in recent years, and with good reason. The injuries have been destroying careers and crippling people with increasing frequency. If you don't know about RSI, [read up on it](#) now, hopefully before it affects you.

You may have heard other names for RSI -- also common are more clinical terms such as cumulative trauma and bilateral overuse syndrome. In addition, many people wrongly refer to all RSI conditions collectively as Carpal Tunnel Syndrome. Actually, Carpal Tunnel is just one of many potential injuries from constant use of a computer.

If you use a computer regularly, you are at risk for RSI. RSI might begin with minor numbness, aches, or tingling. Don't ignore these warning symptoms! The consensus seems to be that RSI is much easier to prevent than to cure. In its most extreme forms, RSI is permanently debilitating.

I suddenly started experiencing intense symptoms of RSI in November 1994, and the condition has changed my life. Until then, I was a conscientious student, and generally did well. For me, the symptoms of RSI struck suddenly and without warning. I don't really understand, even now, why the condition didn't give me pain earlier, but constant pain since and irreversibly positive nerve conduction tests have confirmed that significant damage has been done.

Since then, I've had to make some of the toughest choices in my life. I intend to do anything in my power to stay in this profession, but right now I'm struggling hard just to finish courses on schedule, and it's painful to get among the lowest grades in the class on homework assignments when I know that a year or two ago I would have rewritten the same pages 5 times to get an A.

Even the trauma of the RSI cannot diminish my love for computer science, but I now struggle to survive. A friend of mine summed it up well by saying that thinking constantly about the effect on your fingers while you program is like a truck driver worrying all day about the effect of the road on his tires. Generous people have offered me notes from class, and my university even gave me a typist for a few

hours a week last spring, but neither kind gesture seemed to help much in the long run. I couldn't even finish a couple of my courses that semester. The one that I did finish I did horribly in, trailing the rest of the class considerably.

The last thing I want is anyone's sympathy. But I want to talk frankly about what RSI means to our rapidly evolving society, and to computer scientists, as well as how we can respond to it.

There have been many things about RSI that I've found surprising. First, the fact that a ``harmless machine'' can cripple someone. Second, that the medical community doesn't seem to know how to respond to the problems, even though they are widespread. But most of all, I'm amazed that even though so many people have RSI, it's still commonly regarded as rare, and even denied as a real condition by some people.

When I first developed the symptoms, I was angry about getting a condition that, so far as I knew, nobody else seemed to have. But talking to others about my RSI has revealed that literally about 50 of my friends and close acquaintances are related to someone who has sought medical help for RSI. As a rule, we only notice things once they are relevant to our own lives--now that I've got RSI, I am staggered by the number of wrist splints I see everywhere I go. I'd like you to start noticing the wrist splints *before* you get RSI. Together, maybe we as an industry can do something about it.

About My Hands

This article was motivated by my colleagues' many questions about my hands. Their attitude suggests widespread misconceptions about how serious, and unfortunately widespread, RSI is.

Imagine you found out your friend Tom had a likely-incurable form of leukemia. Would you ask every time you saw him, "So, Tom, how's your leukemia?"

Of course not. You would know that, in the first place, cancer doesn't just disappear overnight. And in the second place, Tom might not want to talk about it all the time. It's not like the flu, where you treat it as a temporary crisis, and then move on. Tom's cancer would be a part of his life, modifying his very outlook.

But even though few would be so insensitive as to ask Tom constantly about his cancer, the most common response I've gotten has been "So how are your hands?" Once I realized that the question was merely an expression of affection or concern, it ceased to irritate me. But the same arguments about leukemia apply to RSI -- it has fundamentally changed my life, it will probably never leave me, and it is not news.

Yeah, I know, you don't die from RSI. Unless, of course, you starve. But it's serious enough to be treated similarly, and people need to realize that it's not going anywhere. RSI needs to be seen more as an unfortunate and very dangerous aspect of our brave new world, and less as the information age

equivalent of a laborer's sore muscles.

Getting Out of Hand -- RSI in our Crisis-Driven Culture

As a society, we tend to be governed increasingly by crisis, which means that quiet problems like RSI get little constructive attention. RSI gradually damages the body over many years, and affects everyone differently. Leadership against such a cunning foe has been slow to emerge. People interested in promoting concern over RSI often attempt to convert the epidemic into a crisis, so that others will take notice. But noise without results can actually harm a cause.

For the sake of simulating a crisis, the complex matter of RSI is often treated as simple. Accusing fingers point at supposed culprits, images are painted of an imminent mass exodus to hospitals and courts, and cheerful voices add to the din a set of tips to avoid RSI. I wish simple exercises or better keyboards could make the world safe for computer users, but they cannot. More basic is the fact that *people in today's world are required to adapt to their work environments, rather than vice versa*, and computers are doing a horrible job of accommodating workers. Such a problem strikes at the core of employee relations (and at the core of computer science).

I liken hysteria over RSI to similar responses to environmental concerns -- arguments that ``we'll have to save our planet before long!'' increase attention, but don't seem to provide focus. Similarly, while awareness will help in the battle against RSI, it's time to stop responding in crisis mode and start talking calmly. I'm hoping that this awkward age of using the remnants of a typewriter for input to the beginnings of information age hubs will leave us soon. But until then, people will continue to suffer without a universally agreed-upon remedy.

A more constructive response than hype or lawsuits is a discussion of *why* RSI is happening, and how computer industry professionals and computer scientists like us can push for a fundamental change.

RSI in the Hands of Vanilla Media

Unfortunately, calm talk is not encouraged by the often pseudo-productive media coverage of RSI. You've probably seen splashy titles about record-breaking numbers of lawsuits, pictures of distraught ``victims'' seeking charges, and quotes from people with impressive titles that issue ominous warnings and provide a laundry list of things to do to ``avoid RSI.''

I honestly think that a lot of reporters covering RSI just read other articles and paraphrase. These articles cater to our desire for simple solutions to frightening and complex problems. Realize three points before you take such articles seriously.

First, the attention-grabbing stance that something dramatic is about to happen is absurd. Usually, these writers imply that record numbers of lawsuits or large numbers of people seeking surgery for Carpal

tunnel has got to result in attention. The implication is that hordes of angry workers will raise sickles in their mangled hands and rush Washington. This image plays on our wishful thinking that problems get dealt with when they affect enough people. RSI is not new, and the number of victims won't change society's response, because those numbers are already high. Further regulation any time soon is unlikely, and the lawsuits haven't been very successful without it.

Second, educated opinions about how to avoid or treat RSI vary considerably. A lot of pat articles don't make that clear. I'm not knocking regurgitated suggestions, as long as readers understand that what they're getting is not gospel. For instance, the four physical therapists that I saw all gave different exercises, and said different things about appropriate heights for chair, monitor, keyboard, etc. Besides, all of our bodies are different, as well as the types of work that we do, and such factors can result in unique needs. If you talk to occupational therapists, hand surgeons, orthopedists, and industrial doctors (not to mention chiropractors and acupuncturists), you will quickly figure out the truth--that nobody really knows much about RSI. The body is too complex, the conditions too varied, and work environments too diverse for easy, simple answers.

Third, the finger-pointing ought not be taken too seriously. Naturally, a media report on a civil case will likely include a lawyer ranting about neglect by a company being sued. But our society is complex, as are the reasons why so many people are becoming afflicted with RSI. It may be true that some people who could choose to make a difference are not helping, but they would be justified in claiming that it's not their responsibility. I don't believe that there are any true perpetrators of RSI, although there are some jerks who do promote its prevalence among their employees. These people could be helping and aren't, but they are well within their rights.

Hand Over Fist--RSI and the Workplace

RSI is clearly a problem that results from a deep cultural foundation, or it wouldn't be as widespread. I've seen a fairly typical company where a lot of typists spent the day under all of the circumstances that breed RSI:

- tremendous stress
- no control over when crises would hit
- lack of breaks
- no personalizing of the work stations
- objectification (e.g. being treated as typing machines)
- a dehumanized environment with little social interaction
- a disrespectful and insensitive employer

They looked miserable and physically uncomfortable throughout the day, but one told me that their manager kept a black-list, and (due to downsizing in the company) she was firing them in the order that she disliked them. They were all therefore very timid, knowing that pure typists aren't worth as much as they used to be. The scary thing is that such scenarios are common at a time when companies are often

fighting to stay afloat.

Given such a structural problem, RSI-breeding circumstances won't be addressed meaningfully without some people taking an initiative beyond their natural call of duty. On one level, people need to point out obvious hardware problems, like unadjustable chairs, where possible. But on a more basic level, any case where humans must conform to their surroundings needs to be reversed. That includes everything from time cards to a monitor that you have to squint to see.

Any time money is involved, we naturally enter complex ethical terrain. I suppose we could establish strict guidelines about RSI, if people ever figure out what those guidelines should be. But I think that the reason why so many people in companies suffer from RSI is that they are treated as machines themselves, rather than people. You can't interface a human to a PC the way you can a modem and expect good results. The manager of those typists would have seen a tremendous increase in productivity had she reduced the conditions that breed RSI.

Employees with RSI need to be seen as people who got their condition by working really hard, and need to be treated with respect and concern. If you respect someone, and are concerned about them, then appropriate treatment will follow. If it were your own father or sister, you would probably even consider reassigning them to a new position with fundamentally different responsibilities. Moreover, if you treat your hard-working employees like family, you will find that they respond with equal consideration for your needs.

Do you want a truly loyal employee? If so, try being sympathetic to one that has developed RSI while working for you. I can say from personal experience that anyone with RSI is rightly terrified about their professional future. If you make the effort to shift the company's thinking away from that person as being a broken machine and more towards accommodating their needs as well as they have the company's, they will probably reward you many times over in serving you with genuine enthusiasm.

If I cannot sway you towards compassion with the above arguments, then I'm afraid you won't be convinced by an ethical discussion. I feel that no amount of ethical debate over what employers should have to provide would make as much of a difference as taking the view that the company should be shaped around the needs of its people, and not vice versa. Of course, there is always the threat of lawsuits. They accomplish little and are unspeakably degrading to everyone involved. I think it speaks volumes for the mind set of many companies that the threat of lawsuits attracts more attention than the health of employees.

Research Opportunities

There is promising potential for interfaces that bring the machine to the user, rather than going the other direction. This would ideally involve collaboration with movement scientists and ergonomists, along with other specialists. Interfaces will always be a critical area of computer science, and I feel that our current interfaces aren't working.

One exciting area is input directly via nerve impulses. For instance, a company in California intends to roll out a product in January of 1996 that permits input to a PC through nerve impulses to a finger. This sort of direct mental contact conjures terror in the hearts of many, who have understandable fears of more intimate subjugation than ever before. We imagine that our arms will atrophy, and we will start having to pay Bill Gates $5 for every orgasm.

But don't forget that we are already in a position to be controlled. Sixty percent of the American workforce centers their day around computers now. Hanging on nostalgically to a horrible interface just because it reminds us of typewriters from a few decades back is not rational. It won't keep us away from a yoke, and it causes countless problems. We need to conform our interface to us, not the other way round.

Research should go into interfaces in general, but with more emphasis on ergonomics and less on speed. For instance, most user interface research reports I've seen have discussed speed and the functions of the mind rather than the functions of the body. Ironically, I think that if we focused more on the body (which serves as the hardware part of the interface), the mind would ultimately be better served. I am too pragmatic to believe that companies will start pushing qualities in their products that they don't think people care about, but I do think that a lot of the ads and marketing that emphasize how productive a machine will make you are influenced by the goals of the research community.

Computer Scientists and RSI

There's frankly no clear motivation for most people in positions of power to change attitudes towards RSI. Actually, most are motivated to entrench the status quo. Surgeons and doctors with expertise in this area are set for life right now, and the computer industry will not be at risk for lawsuits or production requirements as long as no standards are developed. I'm no conspiracy theorist, and I don't blame anyone in particular, but I think we should forget the hope that RSI will naturally fall into some professional group's perceived responsibilities.

I urge you to consider the matter a responsibility of computer scientists. Preventing RSI is not a traditional role for computer scientists, but our role continues to evolve as needed. Now that our hardware and software is central to society, we are obligated to focus our energies on solving the interface problems that remain. The solution will move us closer to what ought to be the goal of computer science: effectively solving problems using computers. We as young computer scientists are in a position to take the initiative in this area, and nobody else will if we don't.

For Further Reading

Pascarelli, Emil MD and Quilter, Deborah. *Repetitive Strain Injury, A Computer User's Guide.* New York: Jon Wiley and Sons, Inc., 1994.

Hawin, Rondald and Haynes, Colin. *Risks and Remedies Every Computer User Needs to Know.* New York: AMACOM, 1992.