



## **The Keyboard That Pays for Itself**

A Case Study Compilation

*How the Goldtouch Standard Keyboard  
Can be a profit Center For Your Business*



## Purpose

Repetitive Stress Injuries (RSI's) are affecting an increasingly larger percentage of the workforce. RSI injuries can range from minor discomfort, tingling fingers, sore wrists, stiff neck and tennis elbow to serious disabilities and everything in between. RSI has become a significant cost of doing business and a diverse range of companies representative of a broad base of industries are confronting the root of the problem by implementing preventative repetitive stress initiatives.

The results of some of these initiatives, as discussed in this paper, are very compelling and the companies involved represent today's leaders in this field. As will be discussed in this paper, the heart of the solution to RSI related issues is in the selection of the right tools for work; specifically, the keyboard. Study after study will demonstrate that the adjustable, split keyboard design is at the center of the solution.

It will also be shown that the Goldtouch keyboard design has shown to be superior to its competitors in test after test, not only in reducing the causes of RSI, but also in increasing employee overall productivity.

## Background

Direct workers' compensation costs in the United States for ergonomics-related injuries are estimated at \$30.9 billion, according to the 2008 Liberty Mutual Workplace Safety Index. The Index captures only the direct worker's compensation costs of these disabling injuries. When indirect costs are considered, which are estimated by experts to be anywhere from two to five times direct costs, the true cost to USA businesses is at \$61.8 to \$154.5 billion.

## Cost Reductions with Repetitive Stress Interventions:

Surgical treatment for carpal tunnel syndrome is the most frequent surgery of the hand and wrist with 463,637 releases annually. Almost half of the carpal tunnel cases result in 31 days or more of work loss. According to the US Department of Labor, Occupational Safety and Health Administration (OSHA), repetitive strain injuries are the nation's most common and costly occupational health problem affecting office workers.

In addition to the financial advantages the results of ergonomic interventions have had a positive impact on:

- Work-related musculoskeletal discomfort
- Job control
- Environmental satisfaction
- Sense of community
- Ergonomic climate
- Communication and collaboration
- Business process efficiency  
(*time and costs*)

## Why Goldtouch?

Adjustability is the key to a good ergonomic keyboard by allowing the user to manipulate the technology to their specific needs and personal characteristics. In many cases, ergonomic keyboards are a little more expensive than conventional ones. However, the studies in this paper will show that potential increased productivity alone may pay for the keyboard, without even considering the exponential cost savings in medical expenses, reduced absenteeism, insurance claims and other related expenses. The Goldtouch line of products offers health benefits by reducing injury risk factors. Moreover, the keyboard use has resulted in demonstrable productivity improvements, with users improving their overall productivity both initially and continuing over time. The increase in productivity is even more compelling when considering that even an improvement of less than 5 minutes per week will pay for the investment of the keyboard over a few months time, and the Texaco Belgium studies support that outcome. In addition, the study continued to show increases of up to 30% in productivity each additional year of the study.

## Superiority of the Goldtouch Keyboard:

It was first suggested in the 1920s that arm strain in the typist could be reduced by splitting the keyboard into two halves and inclining the two halves laterally. The first systematic research on the split keyboard was conducted in the 1960s. This marked the beginning of a prolonged, worldwide research effort to determine whether and how the split keyboard design might improve comfort and prevent pain in keyboard users. By the early 1990s, split keyboard designs began to be broadly commercially available and clear evidence of a health benefit of the split keyboards emerged in the late 1990s. By 2006, a split keyboard was the number one-selling keyboard, of all keyboards sold, in the U.S. retail market.

The Goldtouch Adjustable Keyboard is an exceptional product designed to be adjusted to suit individual body requirements, rather than forcing the body to conform to the technology. It provides for personal adaptation of the two alphanumeric sections to help you attain relaxation of the muscles and tendons of the hands, wrist, arms and shoulders. In doing so, some undesirable awkward postures used in typing can be alleviated. This posture enhancement, combined with correct adjustment of your workstation, can help promote your comfort and productivity.

The Goldtouch Adjustable Keyboard allows users to try various horizontal and vertical adjustments to achieve a neutral typing posture. The range of adjustability provided is 30° horizontally and 30° vertically, however, some keyboard users may find that using the Goldtouch Adjustable Keyboard in the flat and linear position of a standard keyboard is most comfortable for their personal needs. Most users will find their preferred keyboard position will be raised and splayed to some extent, allowing more relaxed and natural “repose” interface. Once again this is the benefit of an adjustable keyboard, it allows the individual to personalize or tailor the keyboard to their unique requirements.

## Key Points:

- 25% of all office worker are effected to some extent by RSI and for every one case reported there are thirteen cases not reported (as reported by the state of Connecticut)
- Users who work on a computer as little as 20 minutes per day may experience injury
- Companies who implemented initiatives experienced:
  - 60% cost reduction in direct workers compensation cost with RSI intervention
  - 50% of their employees who had previously experienced RSI discomfort showed reduced discomfort after intervention
- Independent studies have consistently demonstrated Goldtouch keyboards are superior over competitive products in reducing the risks of repetitive stress injuries
- Independent studies have shown that the design of Goldtouch keyboards have over time increased employee productivity
- Independent studies have also shown that the design of the Goldtouch is intuitive enough that users can adapt to it more quickly with less of a learning curve than other alternative or fixed split designs.
- The return on investment supports a convincing argument of the economic value of ergonomic interventions
- The Regulatory Environment is becoming more involved in the solution and demanding a more proactive approach to the problem

## Case Study 1-Chevron Texaco

### **Results of ChevronTexaco Intervention Initiative:**

- 22,000 employees were involved
- 44% of participants lowered their risk level
- 49% of those who originally had constant or frequent discomfort now have discomfort infrequently or never
- Average cost/claim for those who participated were at least 40% less than non-participants
- In two years, the number of RSI cases have decreased by 71%

As a result of their initiative, ChevronTexaco made the unqualified statement that Repetitive Stress Initiatives will lead to decreased discomfort and less severe and costly claims. Their total workers compensation cost went from \$27.7 million to \$14.3 million in two years. The data from the ChevronTexaco Initiative represents 30% of the company population and costs were not adjusted for national increase in workers compensation costs.

In addition, the following employee observations were made:

- Employees who would recommend the initiative to a colleague 94%
- Employees who say they will work more comfortably 92%

## **Case Study 2 – San Jose University Research Study**

In a recent research study conducted by the San Jose University, standard and/or alternative designed computer keyboards were tested to determine if they increase or decrease exposure to ergonomic risk factors by users. Two popular alternative keyboard designs the Goldtouch and Natural Ergonomic Keyboard (NEK) in conjunction with the standard QWERTY keyboard design were tested to determine which one provided the greatest benefit to the user. The benefits were defined as having minimal or no exposure to ergonomic risk factors such as awkward postures (ulnar deviation and wrist extension greater than 5-degrees), static postures, and contact stress. In addition, typing speed and error were also assessed to determine learning curves associated with new motor learning of an alternate keyboard design.

Result of Study:

- Goldtouch users have less error in the number of words typed per minute compared with the standard QWERTY keyboard which was their original keyboard.
- The NEK group showed an increase with incorrect keying technique/planting of the wrists with keying tasks. Note: It is also worthy to note that four of the 30 participants for the NEK group dropped out due to physical discomfort experienced while using the keyboard in the first week.
- The Goldtouch keyboard group also improved in keying technique by five participants. The Study Group believed that this result was achieved by both ergonomic education and the design of the keyboard that promotes bilateral shoulder retraction with keying tasks.

## **Case Study 3 - Blue Cross Blue Shield Study**

In a further study conducted by Blue Cross Blue Shield on an overall evaluation of keyboard preferences the following factors were assessed relating to a standard keyboard versus the Goldtouch keyboard:

Factors Accessed:

- Keying effort and rhythm
- Fatigue - hands, wrist, forearms, shoulders
- Posture and comfort
- Overall use

In every factor measured, the Goldtouch keyboard rated higher for an average of 8 out of 10 compared to the standard keyboard of 6 out of 10. In addition, 77% of the participant's preferred the Goldtouch keyboard, 67% would buy the Goldtouch keyboard, and 67% would prefer their employer to offer the Goldtouch keyboard.

## Case Study 4 – Texaco Belgium

At Texaco Belgium, a company with 220 employees and part of the Chevron Texaco Corporation, a project was set up to replace the classic QWERTY/AZERTY keyboards with 'ergonomic' keyboards. The project was a part of a large program on preventing repetitive stress injuries. As part of this initiative one of the actions undertaken was to implement computer hardware compliant with strict ergonomic demands. This hardware was selected after a risk assessment and a study of the different hardware available. The keyboard chosen after this selection process was the 'Goldtouch' keyboard.

The overriding contribution of this study was that the results were able to isolate and measure productivity improvements directly associated with an ergonomic keyboard selection. The table below quantifies the cost of the implementation and attributes the benefits not only to avoidance of cost but the effect on employee productivity.

Item	2002	2003	2004	2005
Keyboards & Installation	-\$13,156			
Training & Learning		-\$6,294	-\$5,714	-\$6,242
Reduced Absenteeism		\$14,085	\$20,412	\$28,198
Productivity Increases		\$4,178	\$6,009	\$8,225
Reduced Health Costs		\$1,675	\$3,489	\$4,829
Net Cash Flow	-\$13,156	\$12,403	\$24,196	\$35,010
Present Value of Cash Flows @10%	-\$13,156	\$13,644	\$24,196	\$26,304
<b>Net Present Value</b>	<b>\$45,548</b>			
<b>Profitability Index</b>	<b>4.5</b>			

## Return on Investment:

The return on investment was based predominately on the findings from the ChevronTexaco intervention initiative and the Texaco Belgium intervention initiative. When factors were not directly available, the factors were extrapolated from the ChevronTexaco presentation, Texaco Belgium report, or from other available key industry findings. The ROI results presented here are completely consistent with the findings presented from the ChevronTexaco intervention initiative and the Texaco Belgium report.

Return on Investment	Key Factors	Year 0	Year 1	Year 2	Year 3
Number of employees	30,000				
RSI experience	2.80%				
Average Salary	\$37,500				
Keyboards and Installation	\$150.00	-\$4,500,000	-	-	-
Training & Learning	-	-	\$1,622,690	-\$1,393,628	-\$1,566,060
Reduced Absenteeism	30 days	-	\$870,978	\$1,160,190	\$1,603,447
Productivity Increases - Speed/Errors	-	-	\$326,450	\$444,140	\$625,392
Productivity Increases - Other Related	-	-	\$761,717	\$1,036,326	\$1,459,248
Reduced Health Costs (avg. cost/claim)	\$11,277	-	\$1,701,589	\$3,258,932	\$4,512,465
Related Workers Compensation Costs	2.6	-	\$3,847,576	\$7,368,988	\$10,203,436
Net Cash Flow		-\$4,500,000	\$5,885,618	\$11,874,947	\$16,837,928
<b>Net Present Value (NPV)</b>	<b>10%</b>		<b>\$23,315,153</b>		

### Note:

The prevalent stated range of the indirect cost of RSI is 2.0 to 5.0 times the direct claim cost. This analysis is built on the lower end of the range of 2.6 times. See the full report and methodology located at:

<http://www.goldtouch.com/Resources/Studies/ModellingCostSavings.pdf>

## Results from other companies initiatives/studies

Company/Study	Summary	Results
TELUS	Ergonomics interventions and employee level training	76% reduction in MSD
Eastman Chemical Company	Ergonomics interventions and employee level training	84% reduction W/C costs
Cornell University	Musculoskeletal benefit of an articulating keyboard support	91% said it helped their work performance and preferred it to their previous system
Human Factors	Musculoskeletal benefit of an articulating keyboard support	Findings validate the use of an articulating, negatively sloping keyboard
Bentzel & Gootzeit	Musculoskeletal benefit of an articulating keyboard support	The tiltdown keyboard position was preferred by 87% of the participants
Merrill Lynch	Cost benefit of ergonomic program implementation	70% decrease in MSDs
American Express	Cost benefit of ergonomic program implementation	80% reduction in W/C claims
Navistar	Cost benefit of ergonomic program implementation	65% reduction in W/C
Suntrust Bank	Cost benefit of ergonomic program implementation	Reduced W/C by \$2.65m
New York Times	Cost benefit of ergonomic program implementation	84% reduction of MSDs cases
AT&T Global	Cost benefit of ergonomic program implementation	75% reduction in W/C costs

**Source: Humanscale's paper - Ergonomic Research Summaries**

**Other intervention results:**

Workplace	Interventions	Measurements	Savings
Dainoff – Lab keyboard	Workstation set up.	5% increase in keystroke rate	
Blue Cross – Blue Shield	Ergonomically enhanced environment.	4.4% increase in productivity	
Blue Cross Blue Shield of Kansas	Program, training, workstation evaluation for all new employees, follow-up evaluation, chairs, glare screens, articulating and split keyboards, document holders, mouse rests, and different mouse varieties, workstations, indirect lighting, health and stretching programs, medical management.	CTD-related repetitive strain injury claims 103 in 1991, to 52 in 2001	Claims costs decreased \$526,000 to \$137,000 in 10 years.
Blue Cross & Blue Shield of Rhode Island	Program, ergo teams, training, workstation changes, standardized ergo equipment.	Lost workdays 345 in 1999 down to 104 in 2000 (70 percent in one year).	Workers' Comp costs \$227,620 in 1999 down to \$26,010 in 2000 (89 percent in one year).
3M office	Redesigned workstations: Adjustable chairs with armrests, articulating keyboards.	64% reduction in OSHA injury and illness rate fell from 4.5 to 1.61 incidents per 200,000 worker hrs in one year.	
Siemens VDO Automotive	Program, training, workstation evaluations, new chairs, back cushions, lumbar supports, keyboard/mouse rests, and document holders. Frequent short exercise breaks, proper vision correction.	Workplace strain injuries decreased from 43 percent to zero. Savings of 20,000 hours per year in time previously lost to pain, doctor visits, and time off.	

## Regulatory Compliance

The Clinton Administration had passed a Federal Ergonomics Standard in 1999, but was immediately repealed as George W. Bush took office. It is widely expected that updated legislation will be forthcoming in the Obama administration to hold employers accountable in the face of increasing injuries.

In addition, what is happening in the state of California is definitely a prelude to mandates in other states and given the current administration, to eventually regulations at the federal government level. A California appeals court has upheld the state's ergonomics standard put in place in 1997 and broadened its scope to include employers with nine or fewer employees. The state regulation requires an employer to institute an ergonomics program whenever two or more of its employees performing repetitive tasks have reported repetitive motion injuries (RMIs) within a 12-month time span. These so-called "triggering" RMIs must be predominantly work-related and objectively diagnosed by a licensed physician.

## Conclusion

Repetitive Stress Injury (RSI) is a common problem as people spend longer hours on their computers at work, on the Internet, texting, and gaming. It has been proven over and over that a good part of the reason for these injuries is the poor ergonomic design of many computer keyboards. Even those users who feel no discomfort today could be a ticking time bomb because the damage from RMI tends to build over time, starting as minor discomfort that barely registers, eventually resulting in a minor to serious injury.

It is imperative that companies take a more proactive stance in mitigating risks. The workforce continues to change drastically, as manufacturing jobs are replaced by computer-driven services and applications. More of us work at a computer, and increasingly from a remote or home office environment, where the lack of a uniform and ergonomically-engineered workspace leaves little opportunity for reducing risks from unnatural postures. Because the workforce is being placed into these static, hazardous positions for hours at work, followed by hours of personal computer use at home, the threat of RSI's is real and universal.

The Goldtouch keyboard delivers the only adjustable and widely deployable keyboard solution for a global workforce. It is never too late to understand how the right tools for work can empower a workforce, and protect employer and employee from financial and personal loss. Goldtouch can help you choose the right solutions through our experienced staff and access to leaders in the industry. In addition, we can show you clear benefits and achievable benefits with our ROI tools.

To learn more about Goldtouch solutions and how easy they can be deployed at your organization, contact Goldtouch at [512-259-5688](tel:512-259-5688) or email [sales@goldtouch.com](mailto:sales@goldtouch.com). Quantity discount programs are available.

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