ABOUT the "ORTHOPEDIC COMPUTER MOUSE".

1

I am from AAPS, director of GEMT (labor medicine study group). I have seen the presentation of a fantastic ERGONOMIC TOOL (in …., where it is being tested and already praised due to expected results), recognized in the world, the Orthomouse, that is, a mouse with an anatomic grip, supporting the hand and fingers in full rest and equilibrium. **This mouse allows a "passive adaptation" of the set of wrist/hand/fingers of various sizes, allowing activities for longer periods of time effortlessly**. All that we ergonomists have hoped for: a proactive tool that adds values in injury prevention.

Dr. Ricardo Neder Silveira.
Occupational Medicine.
Director of GEMT (Occupational Medicine Study Group). São Paulo. Brazil.

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…Evidently, the conception of a so called "orthopedic mouse," in which the typist maintains the wrist and the hand in their position of function, is fully justifiable.

The rest of the joints, which is a consequence of the position of function, is important since the relaxation of the joints eliminates possible nervous and/or tendons compression of the carpal tunnel. We can infer that Dr. Julio A. Segalle's conception in developing this type of mouse, fundamentally denominated "position of function" of the wrist and the hand, is of the utmost importance from an ergonomic point of view. Although the problems related to typing are yet to be solved (keyboards cannot suffer great adaptations to totally prevent the occurrence of RSI) **the use of this kind of "orthopedic mouse" will prevent a large portion of the injuries that stem from repeated movements.**

Prof. Dr. Roberto Guarniero.
Orthopedics and Traumatology.
F.M.University of São Paulo.Brazil.

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The functional concepts of these prototypes, which respect the anatomy and physiology of the hand, wrist, and forearm, are fundamentally different from the similar known[devices]. Form and function behave in a more harmonious way, allowing for a higher degree of relaxation during use.

The possibilities of use during long computer-related tasks become much more promising with the hand in the position of functional especially due to the comfort it provides, thus avoiding infamous and poorly tolerated postures that current types of computer mice and other inadequate equipments in the work place impose.

The author, Dr. Julio A. Segalle, **presents solid basis in physiopathology and epidemiology relating to the extensive and intense use of equipments that go against the human hand's physiology and anatomy** in demonstrating the "Orthopedic Computer mouse."

Prof. Dr. Heitor José Rizzardo Ulson
Hand surgery discipline coordinator from the department of orthopedics and traumatology at UNICAMP. São Paulo. Brazil.

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"…tendons and articulations, when not in the position of function, when solicited during long periods, can lead to occupational musculoskeletal disorders…

To prevent these disorders, the following principles should be adopted:

Elimination of incorrect postures of the upper extremity

Reduction of the mechanical compression on the musculoskeletal structures of the upper extremity

Dr. Julio A. Segalle's "Orthopedic Computer Mouse" is an innovative concept that greatly collaborates with the preventive measures cited above.

The "Orthopedic Computer Mouse" allows the hand, while using it, to remain in the position of function while apparently doing so without effort as opposed to devices presently available ("mouse" like)

Due to its conception, which always takes into consideration the preservation of the hand's position of function as well as its biomechanical aspects, the "Orthopedic Computer Mouse" privileges the hand's rest during work, which seems to be of great importance to avoid the appearance of occupational musculoskeletal disorders in computer users."

Dr. Marcos Albino Rizzardo Ulson
Member of the Brazilian Hand Surgery Society
Member of the Brazilian Orthopedics and Traumatology Society

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"…Fulfills the comfort and functionality requirements while ensuring ample support of the prehensor segment, as well as an ease of use of the mobile element.

It could be constituted in an element of ergonomic adjustment thus avoiding discomfort and user's fatigue."

Prof. Dr. Linamara Rizzo Battistela
President of third World Congress of the International Society of Physical and Rehabilitation Medicine. Director of Rehabilitation Medicine, Hospital das Clínicas - Medical School, University of São Paulo. Brazil.

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"…Dr. Segalle, Julio Abel (from Brazil) made an anatomical design of a computer mouse, which I have found very good and innovative, **based on the 'position of function,' which guarantees an innocuous operation by the user…"**

Dr. Eduardo A. Zancolli
Orthopedics and Traumatology. Professor at the University of Buenos Aires. Argentina. He is recognized throughout the world as being the highest authority in surgery of the hand.

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...Dr. Julio Segalle has developed around the Orthopedic Mouse **research that is astounding in its depth and in the theoretical/practical support of its concepts.**

Dr. Juan Carlos Cappello
Director, Occupational Medicine, Johnson & Johnson's, Buenos Aires. Argentina

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"…The orthopedic mouse fills an enormous gap, that of computer mice with real scientific-medical support, which will be translated into a great relief to an enormous mass of suffering users.

It should be constituted, in a rather short term, in the industrial standard."

Dr. Agustín Alcides Cappello
Director, Occupational Medicine, Bimbo, Buenos Aires. Argentina

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“A good example of a mouse is a mouse which supports the hand evenly through a larger area.”

"These data may be useful in the design of tasks and hand tools in the management and prevention of CTS.”

The extension/flexion and ulnar/radial deviation postures associated with lowest carpal tunnel pressure can now be expanded to include a forearm rotation angle near 45º pronation and a metacarpophalangeal joint angle of 45º. This set of postures should be considered during the design of hand-intensive tasks and hand tool in order to minimize carpal tunnel pressure during repetitive activity.”

Prof. David Rempel. M.D., Director UCSF/UCB Ergonomic Program. California. USA.

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The use of a conventional computer mouse requires continuous lifting of the fingers. This results in excessive use of extensor muscles to avoid unwanted switching which can be seen as a possible cause of tension in the deep neck muscles. This new concept is called Horse in view of its functional design: the palm of the hand as well as the middle three fingers "sit" on the main body while thumb and little finger rest at a lower level at the side as if supported by stirrups (Fig. 2). Thumb and little finger work together to realize optimal control in the horizontal (X-Y) plane. The design of the Horse allows for the three middle fingers to adopt a flexed position to relax the tendons. A major part of these fingers rests in a more or less vertical position.

In view of this supported position of the hand and fingers, extensor muscles can relax.

Extensor action is no longer required with the palm of the hand and fingers resting on the Horse. A light flexing action of the top of the fingers is sufficient to switch. This action results in a force on the touch switches situated at the lower end near the tips of the fingers.

- These switches react on touch force only which reduces or virtually eliminates the movement of the tendons when switching. **Moreover, complete support of the fingers will reduce the necessity of co-contraction of the intrinsic muscles of the hand [4].**

Thumb at the side, major part of the three fingers more or less vertical, fingertips touch at the side of the switches.

Chris J. Snijders, PhD, Erasmus MC, University Medical Center Rotterdam. Nederland.
Paul C.Helder, MBA, BA, BSc

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The positioning of the wrist with the new mouse allowed the maintenance of the extension of this joint with less muscle effort. **Its routine use may serve as a strategy to prevent the appearance of pain in computer users as well as symptomatic control on those who have already developed some sort of local injury.**

Dr. Marcelo Riberto. Physiatrist. Rehabilitation Medicine Division of HC, FMUSP. Brazil.
Dra. Maria Inês Paes Lourenção. Occupational Therapist. R. M. D. of HC, FMUSP. Brazil.
José Augusto Lopes. Engineer of the R. M. D. of HC, FMUSP. Brazil.

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"Few concepts have been more useful in saving injured hands than that of the position of function."

Raoul Tubiana M.D., former president of the International Federation of Societies for Surgery of the Hand. Paris. France.

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"Movements of extension of the fingers and of the hand itself, under a functional point of view, are philogenetically subordinated to the previous relaxation of the flexor muscles that are destined to the act of grasping and that are much more potent than their antagonists, the extensors. (See fig.12). The alternation between flexion and extension and the musculotendinous tensions cannot go beyond certain limits in terms of strength or time interval between movements without jeopardizing the functional and morphological integrity of the tissues."

Prof. D. Herval Pina Ribeiro.
Occupational Safety and Health.
F.M.University of São Paulo.Brazil.