

Hypothesis and Claim tested in clinical trial:

1. AsInRedHot, Finger Relief's keyboard layout, prolongs the **onset of symptoms of carpal tunnel syndrome**, as compared to ten fingers and thumbs typing on the control QWERTY keyboard layout.

AsInRedHot prolongs the **onset of symptoms of carpal tunnel syndrome**, as compared to typing on the QWERTY keyboard layout

1. AsInRedHot prolongs the onset of symptoms of carpal tunnel syndrome, **by redirecting or moving the work from the flexor or extensors to interosseous and lubricales muscles to exercise muscles of hand, avoiding the movement adjacent to the median nerve in the carpal canal**, as compared to the control QWERTY keyboard layout.

1. AsInRedHot prolongs the onset of symptoms of carpal tunnel syndrome, **such as swelling, as calculated by volumetric measurement of water displacement of hand, wrist and forearm** as compared to the control QWERTY keyboard layout.

1. AsInRedHot prolongs the onset of symptoms of carpal tunnel syndrome, **such as swelling, as calculated by objective measurement of by tape circumference of the forearm 10 mm distal to epicondyle of elbow** as compared to the control QWERTY keyboard layout.

AsInRedHot prolongs the onset of symptoms of carpal tunnel syndrome, **in the exercise, flexion and extension, of fingers** as compared to the control QWERTY keyboard layout.

AsInRedHot prolongs the onset of symptoms of carpal tunnel syndrome, **such as pain, as self reported subjectively on a visual response scale**, as compared to typing on the control QWERTY keyboard layout.

AsInRedHot prolongs the onset of symptoms of carpal tunnel syndrome, such as **pain**, as self reported subjectively on a **visual analog scale**, as compared to typing on the control QWERTY keyboard layout.

AsInRedHot prolongs the onset of symptoms of carpal tunnel syndrome, such as **pain** sensitivity, as self reported subjectively on a **Palm mapping for pain sensitivity diagram**, as compared to typing on the control QWERTY keyboard layout

Explanation of biological function.

AsInRedHot prolongs the onset of symptoms of carpal tunnel syndrome, **generated by finger flexion and extension by use of the QWERTY keyboard layout, among patients**

who have been diagnosed with carpal tunnel syndrome, including a history of abnormal electromyogram report in the median nerve, forearm, wrist and hand.

1B can **symptoms of carpal tunnel syndrome**, by use of the QWERTY keyboard layout, among patients who have been diagnosed with carpal tunnel syndrome, including a history of **abnormal electromyogram** report in the median nerve, forearm, wrist and hand.

2. Finger flexion and extension can generate symptoms of carpal tunnel syndrome in patients who have been diagnosed with carpal tunnel syndrome, including confirmation by an abnormal electromyogram of the median nerve. |

AsInRedHot prolongs the onset of symptoms of carpal tunnel syndrome, **generated by finger flexion and extension by use of the QWERTY keyboard layout, among patients who have been diagnosed with carpal tunnel syndrome, including a history of abnormal electromyogram report in the median nerve, forearm, wrist and hand.**

3. **AsInRedHot** prolongs the uncompromised hand and finger **neural processes interface of sensors of touch or pain receptors, and effectors of muscles and skeleton**, by prolonging the onset of symptoms of carpal tunnel syndrome as compared to the control QWERTY.

Inferences from the claims tested in the clinical trial:

4. **AsInRedHot** prolongs the onset of symptoms of carpal tunnel syndrome, **such as loss of tactile sensation** in the finger tips as compared to the control QWERTY.

AsInRedHot prolongs the onset of symptoms of carpal tunnel syndrome, **such as the loss of tactile sensation in the finger tips, necessary to train patients with test models used for touching soft breast like modeled foam cups with various size of objects replicating lumps and masses found in breasts (etc) for breast self examination,** as compared to the control QWERTY.

AsInRedHot prolongs the onset of symptoms of carpal tunnel syndrome, such as the loss of tactile sensation in the finger tips, **necessary for patients' breast self examination, and earlier detection of lumps or masses, in the belief that early detection means early treatment, which means higher survival rates and chance of remission,** as compared to the control QWERTY.

QWERTY typists, upon the onset of symptoms of carpal tunnel syndrome, should not rely on the reduced tactile sensation of their finger tips for Breast self

examination (BSE), but should instead visit physicians more frequently, use mammograms, or make other arrangements.

Moral: If you have CTS, don't trust BSE.

4B. AsInRedHot prolongs the loss of tactile sensation in the finger tips, such as required in discerning a **clinically palpable nodal metastases melanoma**, due to onset of symptoms of carpal tunnel syndrome as compared to the control QWERTY.

4C. AsInRedHot's use showed no difference in **nausea** response as compared to the control QWERTY. This is a **qualitatively assumed result, as no one endorsed nausea in their free comment response** (neither AsInRedHot nor QWERTY had nausea.)

5. AsInRedHot prolongs the **onset of symptoms of carpal tunnel syndrome, such as** the loss of **ability** of fingers to **detect or discern lumps and masses**, due to onset of symptoms of carpal tunnel syndrome, such as during **breast self examination**, as compared to the control QWERTY.

5B. AsInRedHot prolongs the **onset of symptoms of carpal tunnel syndrome, such as** the loss of ability of fingers to detect or discern lumps and masses, due to onset of symptoms of carpal tunnel syndrome, such as during **lymphatic system self examination**, as compared to the control QWERTY.

5C. AsInRedHot prolongs the **onset of symptoms of carpal tunnel syndrome, such as** the loss of ability of fingers to detect or discern lumps and masses, due to onset of symptoms of carpal tunnel syndrome, such as during **scrotal self examination**, as compared to the control QWERTY. (pg 191).

5. AsInRedHot prolongs the onset of symptoms of carpal tunnel syndrome, such as the loss of **ability** of fingers to **detect or discern lumps and masses**, due to onset of symptoms of carpal tunnel syndrome, such as during **breast self examination**, as compared to the control QWERTY.

5B. AsInRedHot prolongs the onset of symptoms of carpal tunnel syndrome, such as the loss of ability of fingers to detect or discern lumps and masses, due to onset of symptoms of carpal tunnel syndrome, such as during **lymphatic system self examination**, as compared to the control QWERTY.

5C. AsInRedHot prolongs the onset of symptoms of carpal tunnel syndrome, such as the loss of ability of fingers to detect or discern lumps and masses, due to onset of symptoms of carpal tunnel syndrome, such as during **scrotal self examination**, as compared to the control QWERTY.

6. AsInRedHot prolongs the loss of **ability** of fingers to **floss teeth**, due to onset of symptoms of carpal tunnel syndrome, as compared to the control QWERTY.

6B. AsInRedHot prolongs the loss of ability of fingers to floss teeth, such as would maintain **good dental hygiene**, due to onset of symptoms of carpal tunnel syndrome, as compared to the control QWERTY.

6C. AsInRedHot prolongs the loss of **ability** of fingers to **floss teeth**, such as would maintain **good cardiac health, by avoiding infection from dental infection**, due to onset of symptoms of carpal tunnel syndrome, as compared to the control QWERTY.

6D. AsInRedHot prolongs the loss of ability of fingers to floss teeth, such as would prolong the onset of **dental carries**, due to onset of symptoms of carpal tunnel syndrome, as compared to the control QWERTY.

6E. AsInRedHot prolongs the loss of ability of fingers to floss teeth, such as would prolong the onset of **dental infection**, due to onset of symptoms of carpal tunnel syndrome, as compared to the control QWERTY.

6F. AsInRedHot prolongs the loss of ability of fingers to floss teeth, such as would aid in the **prevention of cavities, plaque and gingivitis**, due to onset of symptoms of carpal tunnel syndrome, as compared to the control QWERTY.

6G. AsInRedHot prolongs the loss of ability of fingers to floss teeth, such as would maintain good cardiac health, by **avoiding endocarditis**, due to onset of symptoms of carpal tunnel syndrome, as compared to the control QWERTY.

7. AsInRedHot's use showed no difference in the level of anxiety (pg 160) response as compared to the control QWERTY. This is a **qualitatively assumed result, as no one endorsed anxiety** in their free comment response (neither AsInRedHot nor QWERTY had **anxiety**).

8. AsInRedHot prolongs the need for **"pain relieving" drugs**, required to relieve the onset of symptoms of carpal tunnel syndrome, as compared to the control QWERTY keyboard layout.

8B. AsInRedHot prolongs the need for "pain relieving" drugs, such as **anti inflammatories**, required to relieve the onset of symptoms of carpal tunnel syndrome, as compared to the control QWERTY keyboard layout.

8C. AsInRedHot prolongs the need for "pain relieving" drugs, such as **steroids**, required to relieve the onset of symptoms of carpal tunnel syndrome, as compared to the control QWERTY keyboard layout.

8D AsInRedHot prolongs the need for “pain relieving” drugs, such as **analgesics**, required to relieve the onset of symptoms of carpal tunnel syndrome, as compared to the control QWERTY keyboard layout.

8E AsInRedHot prolongs the need for “pain relieving” drugs, such as **acteomenophin**, required to relieve the onset of symptoms of carpal tunnel syndrome, as compared to the control QWERTY keyboard layout.

8F AsInRedHot prolongs the need for “pain relieving” drugs, such as **ibuprofen**, required to relieve the onset of symptoms of carpal tunnel syndrome, as compared to the control QWERTY keyboard layout.

8G AsInRedHot prolongs the need for “pain relieving” drugs, such as **aspirin**, required to relieve the onset of symptoms of carpal tunnel syndrome, as compared to the control QWERTY keyboard layout.

8H AsInRedHot prolongs the need for “pain relieving” drugs, such as **morphine**, required to relieve the onset of symptoms of carpal tunnel syndrome, as compared to the control QWERTY keyboard layout.

8I AsInRedHot prolongs the need for “pain relieving” drugs, such as **anesthetics**, (pg 160 - nausea response) required to relieve the onset of symptoms of carpal tunnel syndrome, as compared to the control QWERTY keyboard layout.

8J AsInRedHot prolongs the need for “pain relieving” drugs, such as **NSAIDS (non steroidal anti inflammatory drugs)** required to relieve the onset of symptoms of carpal tunnel syndrome, as compared to the control QWERTY keyboard layout.

9. AsInRedHot prolongs the **risk of allergic reaction**, due to the use of “pain relieving” drugs, such as required to relieve the onset of symptoms of carpal tunnel syndrome, as compared to the control QWERTY keyboard layout.

9B AsInRedHot prolongs the risk of allergic reaction, due to the use of “pain relieving” **over the counter or prescription drugs**, such as required to relieve the onset of symptoms of carpal tunnel syndrome, as compared to the control QWERTY keyboard layout.

9C AsInRedHot prolongs the risk of allergic reaction, due to the use of “pain relieving” drugs, such as **alcohol use by eighty percent of the population**, required to relieve the onset of symptoms of carpal tunnel syndrome, as compared to the control QWERTY keyboard layout.

9D AsInRedHot prolongs the risk of allergic reaction, due to the use of “pain relieving” drugs, such as **as self medication**, required to relieve the onset of symptoms of carpal tunnel syndrome, as compared to the control QWERTY keyboard layout.

21A. AsInRedHot prolongs the need for **“pain relieving” drugs**, required to relieve the onset of symptoms of carpal tunnel syndrome, **thereby reducing reactions to the pain relievers**, such as **constipation from the pain relievers**, as compared to the control QWERTY keyboard layout

21B. AsInRedHot prolongs the need for **“pain relieving” drugs**, such as **Aspirin**, required to relieve the onset of symptoms of carpal tunnel syndrome, **thereby reducing reactions to the pain relievers**, such as **bleeding from the stomach, kidney problems, and worsening heart failure are possibilities, with significant side effects in people over 70**, as compared to the control QWERTY keyboard layout.

21C. AsInRedHot prolongs the need for **“pain relieving” drugs**, such as **ibuprofen**, required to relieve the onset of symptoms of carpal tunnel syndrome, **thereby reducing reactions to the pain relievers**, such as **bleeding from the stomach, kidney problems, and worsening heart failure are possibilities, with significant side effects in people over 70**, as compared to the control QWERTY keyboard layout.

21C. AsInRedHot prolongs the need for **“pain relieving” drugs**, such as **naproxen**, required to relieve the onset of symptoms of carpal tunnel syndrome, **thereby reducing reactions to the pain relievers**, such as **bleeding from the stomach, kidney problems, and worsening heart failure are possibilities, with significant side effects in people over 70**, as compared to the control QWERTY keyboard layout

21D AsInRedHot prolongs the need for **“pain relieving” drugs**, such as **opioids**, required to relieve the onset of symptoms of carpal tunnel syndrome, **thereby reducing reactions to the pain relievers**, such as **constipation**, as compared to the control QWERTY keyboard layout.

21E. AsInRedHot prolongs the need for **“pain relieving” drugs**, such as **opioids**, required to relieve the onset of symptoms of carpal tunnel syndrome, **thereby reducing reactions to the pain relievers**, such as **constipation**, and efforts to relieve **constipation**, such as **bulking agents like psyllium (Metamucil)**, as compared to the control QWERTY keyboard layout.

21F. AsInRedHot prolongs the need for **“pain relieving” drugs**, such as **opioids**, required to relieve the onset of symptoms of carpal tunnel syndrome, **thereby reducing reactions to the pain relievers**, such as **constipation**, and efforts to relieve **constipation**, such as **bulking agents like psyllium (Metamucil)**, as compared to the control QWERTY keyboard layout.

21E. AsInRedHot prolongs the need for **“pain relieving” drugs**, such as **opioids**, required to relieve the onset of symptoms of carpal tunnel syndrome, **thereby reducing reactions to the pain relievers**, such as **constipation**, and efforts to relieve **constipation**, such as as **stool softener like docusate (Colace)**, compared to the control QWERTY keyboard layout.

21F.. AsInRedHot prolongs the need for **“pain relieving” drugs**, such as **opioids**, required to relieve the onset of symptoms of carpal tunnel syndrome, **thereby reducing reactions to the pain relievers**, such as **constipation**, and efforts to relieve **constipation**, such as **laxatives that stimulate the bowels like bisacodyl (Dulcolax) or senna**, as compared to the control QWERTY keyboard layout.

21G.. AsInRedHot prolongs the need for **“pain relieving” drugs**, such as **opioids**, required to relieve the onset of symptoms of carpal tunnel syndrome, **thereby reducing reactions to the pain relievers**, such as **constipation**, and efforts to relieve **constipation**, such as **“powder” consisting of polyethylene glycol beads (Miralax, other brands), lactulose, Milk of Magnesia, or magnesium citrate** as compared to the control QWERTY keyboard layout.

21H.. AsInRedHot prolongs the need for **“pain relieving” drugs**, such as **opioids**, required to relieve the onset of symptoms of carpal tunnel syndrome, **thereby reducing reactions to the pain relievers**, such as **constipation**, and efforts to relieve **constipation**, such as **lactulose**, , as compared to the control QWERTY keyboard layout.

21I.. AsInRedHot prolongs the need for **“pain relieving” drugs**, such as **opioids**, required to relieve the onset of symptoms of carpal tunnel syndrome, **thereby reducing reactions to the pain relievers**, such as **constipation**, and efforts to relieve **constipation**, such as **Milk of Magnesia**, as compared to the control QWERTY keyboard layout.

21J.. AsInRedHot prolongs the need for **“pain relieving” drugs**, such as **opioids**, required to relieve the onset of symptoms of carpal tunnel syndrome, **thereby reducing reactions to the pain relievers**, such as **constipation**, and efforts to relieve **constipation**, such as **magnesium citrate**, as compared to the control QWERTY keyboard layout.

10. AsInRedHot prolongs the risk of **invasive treatments** for treating and relief of the onset of symptoms of carpal tunnel syndrome, as compared to the control QWERTY keyboard layout.

10B AsInRedHot prolongs the risk of invasive treatments, such as **carpal tunnel release**, for treating and relief of the onset of symptoms of carpal tunnel syndrome, as compared to the control QWERTY keyboard layout.

10C AsInRedHot prolongs the risk of invasive treatments, such as **would risk further damage to nerves, arteries, veins, muscles, bones and ligaments**, for treating and relief of the onset of symptoms of carpal tunnel syndrome, as compared to the control QWERTY keyboard layout.

10D AsInRedHot prolongs the risk of invasive treatments, such as would risk **infection**, for treating and relief of the onset of symptoms of carpal tunnel syndrome, as compared to the control QWERTY keyboard layout.

10E AsInRedHot prolongs the risk of invasive treatments, such as would require **convalescence and recovery**, for treating and relief of the onset of symptoms of carpal tunnel syndrome, as compared to the control QWERTY keyboard layout.

10F AsInRedHot prolongs the risk of invasive treatments, such as would require **rehabilitation**, for treating and relief of the onset of symptoms of carpal tunnel syndrome, as compared to the control QWERTY keyboard layout.

10G AsInRedHot prolongs the risk of invasive treatments, such as would require **physical therapy**, for treating and relief of the onset of symptoms of carpal tunnel syndrome, as compared to the control QWERTY keyboard layout.

10H AsInRedHot prolongs the risk of invasive treatments, such as would require **occupational therapy**, for treating and relief of the onset of symptoms of carpal tunnel syndrome, as compared to the control QWERTY keyboard layout.

10I AsInRedHot prolongs the risk of invasive treatments, such as might be contra indicated for women who were **pregnant or might become pregnant**, for treating and relief of the onset of symptoms of carpal tunnel syndrome, as compared to the control QWERTY keyboard layout.

11. AsInRedHot prolongs the onset of **disability**, due to the onset of symptoms of carpal tunnel syndrome, as compared to the control QWERTY keyboard layout.

11B AsInRedHot prolongs the onset of **disability**, such as inability **to close the fingers to the palm without pain, tingling or numbness**, due to the onset of symptoms of carpal tunnel syndrome, as compared to the control QWERTY keyboard layout.

11C AsInRedHot prolongs the onset of **disability**, such as inability to stand the **strain of weight bearing on wrist or hands**, without pain, tingling or numbness, due to the onset of symptoms of carpal tunnel syndrome, as compared to the control QWERTY keyboard layout.

11D AsInRedHot prolongs the onset of **disability**, such as inability to maintain **tactile sensation** in fingers and hands, due to the onset of symptoms of carpal tunnel syndrome, as compared to the control QWERTY keyboard layout.

11E AsInRedHot prolongs the onset of **disability**, such as **recovery or rehabilitation from prophylactic invasive treatment**, due to the onset of symptoms of carpal tunnel syndrome, as compared to the control QWERTY keyboard layout.

11F. AsInRedHot prolongs the onset of **disability**, such as **comorbidities** with carpal tunnel syndrome, due to the onset of symptoms of carpal tunnel syndrome, as compared to the control QWERTY keyboard layout.

11G AsInRedHot prolongs the onset of **disability**, such as **comorbidity arthritis in hands and fingers**, due to the onset of symptoms of carpal tunnel syndrome, as compared to the control QWERTY keyboard layout.

11H. AsInRedHot prolongs the onset of **disability**, such as **comorbidity of burn injury** to hands and fingers, due to the onset of symptoms of carpal tunnel syndrome, as compared to the control QWERTY keyboard layout.

12. AsInRedHot prolongs the **quality of life**, by prolonging the onset of symptoms of carpal tunnel syndrome, as compared to the control QWERTY keyboard layout.

12 B. AsInRedHot prolongs the **quality of life**, by prolonging disability, by prolonging the onset of symptoms of carpal tunnel syndrome, as compared to the control QWERTY keyboard layout.

12C. AsInRedHot prolongs the **quality of life**, by prolonging need for **surgery**, by prolonging the onset of symptoms of carpal tunnel syndrome, as compared to the control QWERTY keyboard layout.

12D. AsInRedHot prolongs the **quality of life**, by prolonging need for **medication or drugs**, by prolonging the onset of symptoms of carpal tunnel syndrome, as compared to the control QWERTY keyboard layout.

12E. AsInRedHot prolongs the **quality of life**, by prolonging the **loss of ability to detect cancer mass or lumps by self examination**, by prolonging the onset of symptoms of carpal tunnel syndrome, as compared to the control QWERTY keyboard layout.

12F. AsInRedHot prolongs the **quality of life**, by prolonging **the loss of ability to maintain dental hygiene**, by prolonging the onset of symptoms of carpal tunnel syndrome, as compared to the control QWERTY keyboard layout.

13. AsInRedHot has similar home row keys as DVORAK simplified keyboard, which was used by AT&T in studies (1970's to 1990's), which DVORAK use reduced the rate of absenteeism, and worker's compensation claims by half as compared to regions using QWERTY. (Note: AT&T explained the differences as a matter of work ethic, those areas with lower absenteeism had a higher work ethic).

14. Moving finger movements away from the full **flexion and extension** muscle control to the **interosseous and lubrical muscle** control **reduced contraction and expansion of tendons** and the movement in the carpal canal **adjacent to the median nerve and reduced pressure** on the median nerve which pressure compromises the nerve leading to symptoms of the carpla tunnel syndrome of pain, tingling, and numbness.

17. **Pragmatic or effectiveness or management trial (pg. 18)**

AsInRedHot **accommodates** patient's diagnosed with carpal tunnel syndrome, and who are familiar with QWERTY, by moving 10 of 16 letters and 2 of 5 punctuation

marks, as compared to other non-QWERTY layouts which move 24 of 26 letters and 5 of 5 punctuation marks.

17B Patients can **adjust** to AsInRedHot in 2 days or 8 hours of training compared to 18 weeks and 54 hours of training for QWERTY.

17C Of about 100 patented non-QWERTY layouts, AsInRedHot relocates or **moves** the **fewest** keys of the QWERTY layout in order to maximize the letter frequency on the home row, which is the middle row of a 4 row layout, which use of high frequency keys minimizes flexion and extension of the fingers, thereby increases the accommodation of all typists over those of any other patented layout.

18. **P. 269** A 2000 survey of 2.5 million medline abstracts did not identify any **co-morbidity studies** for carpal tunnel syndrome (i.e. no Breast cancer and CTS, no heart disease and CTS, etc).

18B Divergent hypotheses of carpal tunnel syndrome (p. 279)

Accepted	Finger Relief
Carpal tunnel syndrome is a local disorder of the wrist.	Carpal tunnel syndrome is systemic .
Carpal tunnel syndrome is not a co-morbidity of significance.	Carpal tunnel syndrome is a significant co-morbidity.
Carpal tunnel syndrome does not impact breast cancer.	Carpal tunnel syndrome impedes discovery of breast cancer .
Carpal tunnel syndrome does not impact arthritis.	Carpal tunnel syndrome exacerbates arthritis .
Carpal tunnel syndrome does not impact endocarditis.	Carpal tunnel syndrome impacts dental hygiene which impacts endocarditis .
Carpal tunnel syndrome is not aggravated by QWERTY layout.	Carpal tunnel syndrome symptoms are aggravated by QWERTY .
Carpal tunnel syndrome does not impact melanoma.	Carpal tunnel syndrome impedes discovery of clinically palpable nodal metastases melanoma .

AsInRedHot prolongs the onset of symptoms of carpal tunnel syndrome, **a systemic disorder**, as compared typing on the control QWERTY keyboard layout.

AsInRedHot prolongs the onset of symptoms of carpal tunnel syndrome, **a significant co-morbidity to any other malady**, as compared to typing on the control QWERTY keyboard layout.

AsInRedHot prolongs the onset of symptoms of carpal tunnel syndrome, **which symptoms impeded the discovery of breast cancer**, as compared to typing on the control QWERTY keyboard layout.

AsInRedHot prolongs the onset of symptoms of carpal tunnel syndrome, **which symptoms exacerbates anthritis**, as compared to typing on the control QWERTY keyboard layout

AsInRedHot prolongs the onset of symptoms of carpal tunnel syndrome, **which symptoms impact dental hygiene and therefore endocarditis**, as compared to typing on the control QWERTY keyboard layout

19. **Explanatory or efficacy trial (p. 19)**

AsInRedHot can work among patients dianosed with carpal tunnel syndrome to prolong the onset of symptoms of carpal tunnel syndrome due to the use of a **personal computer** or typewriter keyboard layout.

20. **Directional hypothesis testing (p. 132)** that QWERTY is a worse exercise of the hand and fingers.

The QWERTY keyboard layout requires reaching, **flexion and extension** for fingers to press the most used letters in English, so as to **cause an onset of symptoms** of carpal tunnel syndrome among patients diagnosed with carpal tunnel syndrome.

The **efficacy** of AsInRedHot is such **that its technology works in all circumstances** to prolong the onset of symptoms of carpal tunnel syndrome, as compared to typing on the QWERTY keyboard layout.

The **Effectiveness** of AsInRedHot is such **that its technology works under real life conditions** to prolong the onset of symptoms of carpal tunnel syndrome, as compared to typing on the QWERTY keyboard layout.

The **Efficiency** of AsInRedHot is such **that each dollar of cost provides a hundred dollars of benefits**, by prolonging the onset of symptoms of carpal tunnel syndrome, as compared to typing on the QWERTY keyboard layout.

The **Performance bias** of AsInRedHot is such **that a lower level of technical skill required of the typist**, by prolonging the onset of symptoms of carpal tunnel syndrome, as compared to typing on the QWERTY keyboard layout.

The **treatment bias of hand surgery**, to remedy pain due to carpal tunnel syndrome, is consistent with the tendency in medicine to opt for intervention in the natural course of disease, rather than understand preventive or alternative care (i.e. don't reinvent the typewriter).

A **cost minimization analysis** shows AsInRedHot is the procedure which carries the least cost, by reducing pain relieving drugs, reducing surgery, and improving quality of life, by prolonging the onset of symptoms of carpal tunnel syndrome, as compared to typing on the QWERTY keyboard layout.

A Cost effectiveness analysis shows AsInRedHot is the procedure which has a shorter length of disability before subject can return to active employment or exercise, by reducing the need for carpal tunnel release surgery, by prolonging the onset of symptoms of carpal tunnel syndrome, as compared to typing on the QWERTY keyboard layout.

A Cost benefit analysis of AsInRedHot converts the prevented morbidity of a quarter million carpal tunnel release surgeries annually (\$675 million), by reducing the need for carpal tunnel release surgery, by prolonging the onset of symptoms of carpal tunnel syndrome, as compared to typing on the QWERTY keyboard layout.

A Cost benefit analysis of AsInRedHot converts the prevented morbidity of 7,000 breast cancer deaths annually (\$7 billion), by maintaining or improving tactile sensation in the finger tips in support of breast self examination, by prolonging the onset of symptoms of carpal tunnel syndrome, as compared to typing on the QWERTY keyboard layout

A Secondary benefit analysis shows AsInRedHot's future benefits resulting from the acquisition of the technology will includes reduced workers' compensation claims, reduced absenteeism, among keyboarding patients, by prolonging the onset of symptoms of carpal tunnel syndrome, as compared to typing on the QWERTY keyboard layout.

The Quality adjusted life years evaluation (QALY) of AsInRedHot is such that the level of health status and effect on patient's life is improved, by not losing use of fingers, hands, wrists or arms, by prolonging the onset of symptoms of carpal tunnel syndrome, as compared to typing on the QWERTY keyboard layout.

The Overview analysis – meta analysis. in the scientific literature according to the *Illustrated World Encyclopedia*, Vol. 14, 1970, Glen Cove, New York, p. 4694. describes QWERTY technology as “very poor”.

The Overview analysis – meta analysis. in the scientific literature according to the *Quantification of Tendon Excursion &c*, Flannery, Robertson, and Cooper, Conference Proceedings, 19th Annual Meeting of the American Society of Biomechanics, sponsored in part by NASA and the Department of Veterans Affairs, August 1995, p. 195, paper “Quantification of Tendon Excursion Through Kinematic Analysis of Typing Movements on Alternative Keyboard Layouts”. The paper acknowledges partial funding by the U.S. Department of Education, Rehabilitation Services Administration.) scribes QWERTY technology as "awkward . . . designed to slow typing".

The Overview analysis – meta analysis. in the scientific literature according to the *Typists' Speed & Efficiency*, Virginia Russell, Computer Technology Review, Winter 1985 describes QWERTY technology as "worse possible arrangement".

The Overview analysis – meta analysis. in the scientific literature according to the *Century of the Typewriter*, Wilfred A. Beeching, New York: St. Martin's Press, 1974, pp. 14 to 47 describes QWERTY technology as "confidence tricks" [or scam].

The Overview analysis – meta analysis. in the scientific literature according to the *Conquering the Keyboard*, by Robert Alonso, Personal Computing, August 1985, p. 72 describes QWERTY technology as "wrong thing".

The Overview analysis – meta analysis. in the scientific literature according to the 1994 Compton's Encyclopedia, Typewriter, p. 342. describes QWERTY technology as "not the best . . . [makes] much more work".

The Overview analysis – meta analysis. in the scientific literature according to the National Museum of American History, Smithsonian Institution, Wash. D.C. 1992, p.39 describes QWERTY technology as "The Case Against QWERTY".

The Overview analysis – meta analysis. in the scientific literature according to the CTD News, April 1995. Reprinted by permission of CTD News, Haverford PA 19041 describes QWERTY technology as “greater potential for CTDs” [cumulative trauma disorder or disability) and Alternative key layouts SAFER than QWERTY."

The Decision analysis for the preferred course of action from research of Dr. Rick Robertson of the University of Pittsburgh Medical Center. who notes the problem is the large number of times you have to go to the top and bottom rows using QWERTY, ... As soon as you move from the home row, you increase the angular motion of the fingers and sliding motion of the tendons, which increases the potential for CTDs” “ASINREDHOT layouts requiring less total tendon excursion than typing on the QWERTY layout."

21A. AsInRedHot prolongs the need for “**pain relieving**” **drugs**, required to relieve the onset of symptoms of carpal tunnel syndrome, **thereby reducing reactions to the pain relievers**, such as **constipation from the pair relievers**, as compared to the control QWERTY keyboard layout.

21B. AsInRedHot prolongs the need for “**pain relieving**” **drugs**, such as **Aspirin**, required to relieve the onset of symptoms of carpal tunnel syndrome, **thereby reducing reactions to the pain relievers**, such as **bleeding from the stomach, kidney problems**,

and worsening heart failure are possibilities, with significant side effects in people over 70, as compared to the control QWERTY keyboard layout

21C. AsInRedHot prolongs the need for **“pain relieving” drugs**, such as **ibuprofen**, required to relieve the onset of symptoms of carpal tunnel syndrome, **thereby reducing reactions to the pain relievers**, such as **bleeding from the stomach, kidney problems, and worsening heart failure are possibilities, with significant side effects in people over 70,** as compared to the control QWERTY keyboard layout

21C. AsInRedHot prolongs the need for **“pain relieving” drugs**, such as **naproxen**, required to relieve the onset of symptoms of carpal tunnel syndrome, **thereby reducing reactions to the pain relievers**, such as **bleeding from the stomach, kidney problems, and worsening heart failure are possibilities, with significant side effects in people over 70,** as compared to the control QWERTY keyboard layout

21D AsInRedHot prolongs the need for **“pain relieving” drugs**, such as **opioids**, required to relieve the onset of symptoms of carpal tunnel syndrome, **thereby reducing reactions to the pain relievers**, such as **constipation**, as compared to the control QWERTY keyboard layout.

21E. AsInRedHot prolongs the need for **“pain relieving” drugs**, such as **opioids**, required to relieve the onset of symptoms of carpal tunnel syndrome, **thereby reducing reactions to the pain relievers**, such as **constipation**, and efforts to relieve **constipation**, such as **bulking agents like psyllium (Metamucil)**, as compared to the control QWERTY keyboard layout.

21F. AsInRedHot prolongs the need for **“pain relieving” drugs**, such as **opioids**, required to relieve the onset of symptoms of carpal tunnel syndrome, **thereby reducing reactions to the pain relievers**, such as **constipation**, and efforts to relieve **constipation**, such as **bulking agents like psyllium (Metamucil)**, as compared to the control QWERTY keyboard layout.

21E. AsInRedHot prolongs the need for **“pain relieving” drugs**, such as **opioids**, required to relieve the onset of symptoms of carpal tunnel syndrome, **thereby reducing reactions to the pain relievers**, such as **constipation**, and efforts to relieve **constipation**, such as **as stool softener like docusate (Colace)**, compared to the control QWERTY keyboard layout.

21F.. AsInRedHot prolongs the need for **“pain relieving” drugs**, such as **opioids**, required to relieve the onset of symptoms of carpal tunnel syndrome, **thereby reducing reactions to the pain relievers**, such as **constipation**, and efforts to relieve **constipation**, such as **laxatives that stimulate the bowels like bisacodyl (Dulcolax) or senna**, as compared to the control QWERTY keyboard layout.

21G.. AsInRedHot prolongs the need for **“pain relieving” drugs**, such as **opioids**, required to relieve the onset of symptoms of carpal tunnel syndrome, **thereby reducing reactions to the pain relievers**, such as **constipation**, and efforts **to relieve constipation**, such as **“powder” consisting of polyethylene glycol beads (Miralax, other brands)**, lactulose, Milk of Magnesia, or magnesium citrate as compared to the control QWERTY keyboard layout.

21H.. AsInRedHot prolongs the need for **“pain relieving” drugs**, such as **opioids**, required to relieve the onset of symptoms of carpal tunnel syndrome, **thereby reducing reactions to the pain relievers**, such as **constipation**, and efforts **to relieve constipation**, such as **lactulose**, , as compared to the control QWERTY keyboard layout.

21I.. AsInRedHot prolongs the need for **“pain relieving” drugs**, such as **opioids**, required to relieve the onset of symptoms of carpal tunnel syndrome, **thereby reducing reactions to the pain relievers**, such as **constipation**, and efforts **to relieve constipation**, such as **Milk of Magnesia**, as compared to the control QWERTY keyboard layout.

21J.. AsInRedHot prolongs the need for **“pain relieving” drugs**, such as **opioids**, required to relieve the onset of symptoms of carpal tunnel syndrome, **thereby reducing reactions to the pain relievers**, such as **constipation**, and efforts **to relieve constipation**, such as **magnesium citrate**, as compared to the control QWERTY keyboard layout.

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