[1] *Iso 11226:2000 ergonomics – evaluation of static working postures.* [Online]. Available: https:
//subscriptions-techstreet-
com.myaccess.library.utoronto.ca/products/70275.

Table 1 — Trunk posture

Postural characteristic	Acceptable	Go to step 2	Not recommended
1) Symmetrical trunk posture [a]			
No			X
Yes	X		
2) Trunk inclination α [b]			
> 60°			X
20° to 60° without full trunk support		X	
20° to 60° with full trunk support	X		
0° to 20°	X		
< 0° without full trunk support			X
< 0° with full trunk support	X		
3) For sitting: convex lumbar spine posture [c]			
No	X		
Yes			X

[a] With a symmetrical trunk posture, there is neither axial rotation nor lateral flexion of the upper part of the trunk (thorax) with respect to the lower part of the trunk (pelvis) (see Figure 1).

[b] Posture during task execution (dark body segment, solid line) with respect to the reference posture (white body segment, broken line) when viewed from the side of the trunk (for α see Figure 2, where forward inclination is given a positive sign). Annex A describes the procedure for determining trunk inclination.

[c] Convex curvature of the lumbar part of the spine (see Figure 3). This posture is more likely to occur

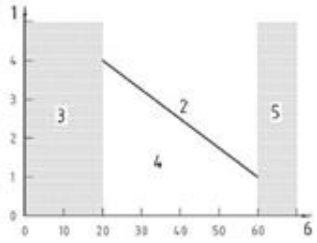
— when the lumbar spine is not supported by a backrest, and

— when a small hip angle is adopted (see 3.7).

Table 2 — Holding time for trunk inclination

Holding time	Acceptable	Not recommended
> maximum acceptable holding time [a]		X
⩽ maximum acceptable holding time [a]	X	

[a] Taken from Figure 4.



Key
1 Maximum acceptable holding time (minutes)
2 Not recommended
3 See 3.4.1, step 1
4 Acceptable
5 See 3.4.1, step 1
6 Trunk inclination α (degrees vs. reference posture)

Figure 4 — Maximum acceptable holding time vs. trunk inclination

[2] *Ab-1817 product safety: Textile articles: Perfluoroalkyl and polyfluoroalkyl substances (pfas).(2021- 2022).* [Online]. Available: https://leginfo.legislature.ca.gov/faces/billTextClient. ..

THE PEOPLE OF THE STATE OF CALIFORNIA DO ENACT AS FOLLOWS:

SECTION 1. (a) The Legislature finds and declares all of the following:

(1) Perfluoroalkyl and polyfluoroalkyl substances, or PFAS, are persistent, toxic, and bioaccumulative substances with multiple adverse effects on human health.

(2) PFAS are utilized in a broad range of products for their water- and stain-resistant properties, including clothing and textiles, despite the growing body of evidence that these materials may leach into food, water supplies, and even the human body through prolonged exposure. PFAS in apparel and textiles can contaminate sources of drinking water and our environment in multiple ways, including through washing and disposal in landfills and incinerators, in addition to impacts on workers and communities in manufacturing locations and global circulation of these persistent chemicals.

(3) Adverse health impacts associated with PFAS include kidney and liver damage, decreased immune system function, interference with vaccine uptake, developmental and reproductive harm, increased risk of asthma, and increased incidences of testicular and kidney cancer for those with high exposure.

(4) Multiple alternatives to PFAS have been identified for water resistance in clothing and textiles. For addressing stains, soap and water work well for most situations, and alternative materials and cleaning solutions offer additional options. This legislation, therefore, phases these uses of PFAS out.

(5) However, for some personal protective equipment (PPE), such as for firefighting gear, alternatives to PFAS are not currently in use. Firefighters face elevated levels of exposure to PFAS through a variety of means, including PPE that is treated with PFAS for its water-resistant properties, as well as through aqueous film-forming foams (AFFF) that contain highly fluorinated forms of fluorosurfactants.

(6) In 2020, the Legislature passed and the Governor signed into law Senate Bill 1044, phasing out the use of these fluorinated foams by prohibiting manufacturers from manufacturing, distributing, or selling any firefighting foams containing intentionally added PFAS beginning in 2022, with limited exemptions in place for facilities that require more time to transition their systems.

(7) This restriction on the sale and use of fluorinated foams, both in responding to emergencies as well as in training exercises, was in direct response to the health risks posed by repeated exposures, and in recognition of the environmental and other public health impacts of the discharge of these toxic foams.

(8) No such phaseouts were mandated for PPE in Senate Bill 1044, and unlike AFFF, currently there are no effective alternatives to PFAS in use for critically important, lifesaving PPE. Instead, the bill contained a provision mandating the notification by the seller of PPE to the purchaser if PFAS is present in the PPE, to be kept on file three years from the date of the transaction.

(9) Research and product development is currently ongoing to create PPE without PFAS that meets the stringent safety standards required for use by firefighters. Once these products are approved, it is of paramount importance that replacements are made as quickly as possible to ensure that California's firefighters are not forced to expose themselves to toxic substances while wearing their required safety equipment.

(10) While this act exempts PPE for the time being to ensure that first responders and other workers continue to have protection on the job, steps must be taken by all employers and manufacturers to ensure that PFAS are eliminated from PPE as quickly as possible, and to limit exposures as much as possible in the meantime.

(b) It is the intent of the Legislature that manufacturers of textile articles eliminate the use of PFAS from their materials, and that manufacturers of PPE, for which there are no current alternatives to PFAS, engage in product development and research in order to phase them out as quickly as possible.

[3] California enacts broad prohibitions on flame retardant use," [Online]. Available: https:/ / www . bdlaw . com / publications / california - enacts - broad - prohibitions - on -flame - retardant - use / # : ~ : text = 2998 % 20prohibits % 20any % 20person % 20from , for %20including%20in%20the%20list..

California Governor Jerry Brown has signed into law Assembly Bill (A.B.) 2998, restricting the sale of flame retardant-containing children products and furniture. Effective January 1, 2020, A.B. 2998 prohibits any person from selling or distributing new juvenile products (*i.e.*, products used by infants and children under the age of 12), mattresses, and upholstered furniture that contain a designated flame retardant chemical at levels above 1,000 parts per million. The law also prohibits, beginning on January 1, 2020, a custom upholsterer from repairing or reupholstering upholstered furniture using replacement components that contain more than 1,000 ppm of a designated flame retardant chemical.

An act to add Chapter 13.5 (commencing with Section 108970) to Part 3 of Division 104 of the Health and Safety Code, relating to public health.

[Approved by Governor September 29, 2022. Filed with Secretary of State September 29, 2022.]

LEGISLATIVE COUNSEL'S DIGEST

AB 1817, Ting. Product safety: textile articles: perfluoroalkyl and polyfluoroalkyl substances (PFAS).

Existing law prohibits, beginning January 1, 2023, any person from distributing, selling, or offering for sale in the state any food packaging that contains regulated perfluoroalkyl and polyfluoroalkyl substances or PFAS, as defined, and requires a manufacturer to use the least toxic alternative when replacing regulated perfluoroalkyl and polyfluoroalkyl substances or PFAS in food packaging to comply with this requirement. Existing law similarly prohibits, beginning July 1, 2023, a person from selling or distributing in commerce in this state any new, not previously owned, juvenile product, as defined, that contains regulated PFAS chemicals.

This bill would prohibit, beginning January 1, 2025, any person from manufacturing, distributing, selling, or offering for sale in the state any new, not previously owned, textile articles that contain regulated PFAS, except as specified, and requires a manufacturer to use the least toxic alternative when removing regulated PFAS in textile articles to comply with these provisions. The bill would require a manufacturer of a textile article to provide persons that offer the product for sale or distribution in the state with a certificate of compliance stating that the textile article is in compliance with these provisions and does not contain any regulated PFAS.

Vote: majority Appropriation: no Fiscal Committee: no Local Program: no

[4] *Determining voltage levels of concern for human and animal response to ac current.*

In terms of startle reaction levels, the UL leakage current limits [4] provide the basis where 0.5 milliamps has been selected as the level where more than 99 percent of the population will not have a startle reaction to that level of current. These values were determined by way of substantial testing and have some inherent factors of safety built in. It is difficult to translate this to a precise voltage, but the most conservative 15 volt level found in Table 1. provides a level that may be useful for initial discussion for a startle reaction threshold.

[5] J. G. Bralla, *Design for Manufacturability Handbook*, 2nd ed. McGraw-Hill, 1999, ISBN: ISBN: 978-0-07-007139-1. [Online]. Available: https://www.accessengineeringlibrary.com/binary/mheaeworks/03f486c4689e37d6/d9932f0a4f01b04de811b6587c2bfb5a538ed30b94f651b6a9c834 ..

TABLE 1.4.23 Major Principles of Design for Assembly

Minimize the number of parts in the assembly
Combine parts
Incorporate hinges, springs, bearings, guides, and other functions into the basic parts.
Eliminate fasteners by using snap fits to hold parts together.
Put electrical and electronic components in one location and consolidate components as much as possible.
Make an outright reduction For example, use fewer fasteners.
Make a full redesign of the assembly
Use a different technology For example, electronics instead of mechanical linkages.

[6] “Analysis of shoulder compressive and shear forces during functional activities of

daily life,"

This study analyses shoulder compression force components and shear force components during 26 functional activities of daily life utilizing a musculoskeletal shoulder model. The results demonstrate substantial loads through the shoulder with the contact force exceeding 50% of the body weight in 10/26 activities of daily living. The ratio of glenohumeral shear force component to compression force component exceeds 0.5 in 8/26 functional activities, with glenohumeral ratios for tasks involving for reaching across the body (1.09; SD 0.41) and picking and placing an everyday object (0.88; SD 0.36). The loading of the joint is considerable not only when high loads act at long lever arms but also at high angles of arm elevation. This improved understanding of glenohumeral joint loading will aid implant design, design of surgical procedures and rehabilitation planning.

[7] *Iec 60721-3-3 ed. 3.0 b:2019 classification of environmental conditions - part 3-3: Classification of groups of environmental parameters and their severities - stationary use at weather- protected locations.*

– 3K21 applies to continuously temperature-controlled enclosed locations. Humidity is not normally controlled.

  Heating, cooling or humidification is used where necessary to maintain the required conditions, especially where there is a large difference between them and the open-air climate. Installed products may be exposed to secondary effects of solar radiation due to increased ambient temperature and to heat radiation. They may also be exposed to movements of surrounding air due to draughts in buildings, for example through open windows, or due to special process conditions.

The conditions of this class may be found in continuously manned offices, workshops, data centres and other rooms for special applications.

[8] *Flowfly kids lunch box insulated soft bag mini cooler back to school thermal meal tote kit for girls, boys, black : Amazon.ca: Home.* [Online]. Available: https://www.amazon.ca/ Insulated- Cooler - School - Thermal - FlowFly /dp /B084JP8LQT /ref= sr_ 1 _ 31 ? dib= eyJ2IjoiMSJ9.5DB5Bvau2kAdv_LPYhgmSwdj03n5I7t0n5DtO9h99Ekre3_QvB3gzOV 2FH14bhgUB2LTVTBhU_ VT63oEYvMP0PlSYtKCLh3fapmqbRcat8KWyycPJ4V4mpAH5o2fqHVC06BqqJz62O Pu-T8wfodBmogPHLtHGDz_ YbMmx5FkgT2GhPzk4QWU4vRuU9kxEo76c- 99IZqqz3b92ZzOCQllEPf_-KoJvPNECGIal3aVt9b_ 38MLABeHz2JqaRUya71zpr906818osWEO0VVoSktuVBJsP1y4i7AxMZ_09SvXD4.Elz xUtzb_gaN2DMEaJCHqe- 3erLnscxhvu_c1SaZft8&dib_tag=se&hvadid=604748003003&hvdev=c&hvlocphy =9000934&

hvnetw = g & hvqmt = e & hvrand = 3905102597394909539 & hvtargid = kwd - 315460998209 & hydadcr=915_1015040235&keywords=lunch%2Bbag%2Bamazon&qid =1732720011&sr=8- 31&th=1.

- ✿ Spacious Design – Measures L: 27 x W: 11 x H: 20 CM You'll find it super spacious and will have no problem fitting your meat and milk inside,Go ahead, pack that extra treat! This FlowFly lunch pouch suit to children adult, men, women,work,office,beach.It is suitable for fitting into backpack .

[9] *Industry guide to health canada's safety requirements for children's toys and related products*, -08-31 2018. [Online]. Available: https://www.canada.ca/en/health-canada/services/consumer-product-safety/reports-publications/industry-professionals/industry-guide- safety- requirements- children- toys- related- products- summary/guidance-document.html.

Drop test procedure

The Product Safety Laboratory Method M01.1 drop test procedure states that a toy be dropped four times onto a tile-covered concrete floor. Each drop is conducted with the toy in a different orientation. The orientations chosen are those considered as most likely to cause damage during the drop. A toy is dropped from a height of 1.37 metres (4.5 feet) if it is likely to be used by a child under three years of age. It is dropped from a height of 0.91 metres (3 feet) if it is likely to be used by a child of three years of age or older. Following each drop the toy is inspected for applicable safety hazards such as detached small components, sharp points and sharp edges.

[10] *A comprehensive guide to design and manufacture safe and durable toys* [Online]. Available: https : / / karkhana . io / a - comprehensive - guide - to - design - and - manufacture - safe - and - durable - toys / , % 20https : / / karkhana . io / a - comprehensive-guide-to-design-and-manufacture-safe-and-durable-toys/.

The safety and durability of toys heavily rely on the selection of materials. Manufacturers must carefully choose safe, non-toxic, and sturdy materials that comply with regulatory requirements and pose no harm to children's health. They must consider various factors such as the age range of the target audience, the type of toy, and the intended use. For instance, toys for young children must be easy to clean and made of safe materials since young children tend to put toys in their mouths. On the other hand, toys for older children can use more advanced materials and manufacturing processes.

Manufacturers should also prioritize the environmental impact of the materials they use. The materials should be sustainable and eco-friendly, and the manufacturing process should minimize waste and energy consumption. Compatibility is also crucial in material selection as the materials must not react with each other, which can lead to product defects or harm to children. Lastly, manufacturers must consider the availability and cost of the materials they select to ensure a steady supply chain and meet production demands.

[11] *Macbook pro*. [Online]. Available: https://www.apple.com/ca/macbook-pro/specs/.

Weight (M4 Pro): 1.60 kg (3.5 pounds)[9]

Weight (M4 Max): 1.62 kg (3.6 pounds)[9]

[12] *How do you measure the breathability (r.e.t.) of a material?* [Online]. Available: https://www.quechua.com/how-do-you-measure-the-breathability-r-e-t-of-a-material

Breathability is measured using the Thermal Evaporative Resistance (RET) coefficient. It measures the capacity of a fabric to stop water vapour getting out. The lower this resistance (i.e. the lower the coefficient), the more breathable the fabric!
(The test method is defined by the ISO 11092 standard).

The RET score uses a numerical index:

- RET < 6: the fabric is extremely breathable, so you'll be comfortable while doing your most intense physical activity.

- RET between 6 & 12: the material is very breathable, making it suitable for moderate physical activity.

- RET between 12 & 20: the fabric is moderately breathable, and therefore not particularly pleasant to wear during physical activity

- RET > 20: the fabric isn't very breathable and therefore not suitable during even light physical activity.

- RET >40: the fabric is considered to be non-breathable.

[13] R. Rosenblum, Pregnant belly shape and size: A month-by-month guide. [Online]. Available:https://www.newtonbaby.com/blogs/pregnancy/pregnant-belly.

It makes sense that you don't show much (or at all) during the first trimester because your baby is very tiny! Your baby goes from a fertilized egg at conception to being around three inches long by week 12.

[14] J. B. G, "Design for manufacturability," in M. Handbooks, Ed., p. 1.64. [Online]. Available: https://www.accessengineeringlibrary.com/binary/mheaeworks/03f486c4689e37d6/d9932f0a4f01b04de811b6587c2bfb5a538ed30b94f651b6a9c83456b8ed6ca4/book-summary. ..

8. Avoid sharp corners; use generous fillets and radii. This is a universal rule applicable to castings and molded, formed, and machined parts. Generously rounded corners provide a number of advantages. There is less stress concentration on the part and on the tool; both will last longer. Material will flow better during manufacture. There may be fewer operational steps. Scrap rates will be reduced.

[15] R. Epstein, S. Colford, E. Epstein, B. Loye, and M. Walsh, "The effects of feedback on computer workstation posture habits," pp. 73–79, Jan. 2012. [Online]. Available: https://journals.sagepub.com/doi/epdf/10.3233/WOR-2012-1287.

Median values for percentage of time spent having proper posture with various ergonomic pads are as follows: with only the initial cue to sit properly (no pad), 0% (5^{th} percentile: 0%, 95^{th} percentile: 70%); use of the Blind Posture Pad, 40% (5^{th} percentile: 0%, 95^{th} percentile: 100%); use of the Feedback Posture Pad, 100% (5^{th} percentile: 83%, 95^{th} percentile: 100%). These findings are summarized in Fig. 3.

Statistical analyses between the conditions (all carried out using sign tests) showed that both prototypes resulted in significant improvements over baseline posture ($p < 0.001$ and $p < 0.0001$ for Blind and Feedback models respectively). Between the prototypes, the Feedback model significantly outperformed the Blind model ($p < 0.001$).

4. Discussion

The Qualcomm results (80% of employees sitting incorrectly) clearly demonstrated that equipment and training given to employees or frequent computer users will not automatically result in correct sitting posture. Even the best equipment will not ensure desired results without proper training. A source of continuous feedback should be provided in order for training or equipment to result in sitting correctly and the development of lasting good posture habits.

[16] K. Knapp, *How to pick the most breathable fabrics*. [Online]. Available: https://www.rei.com/learn/expert-advice/how-to-pick-the-most-breathable-fabrics.html.

2. Nylon and Polyester

Most activewear features one of these two synthetic materials.

- **Pros:** Wicks moisture and dries quickly; resists pilling and abrasion.
- **Cons:** Not as soft as cotton, retains odor, breathability varies based on yarn size and knit or weave.

[17] M.-C. Tsai, E. T. .-. Chu, and C.-R. Lee, "An automated sitting posture recognition system utilizing pressure sensors," *Sensors*, vol. 23, no. 13, p. 5894, /1 2023. DOI: 10.3390/s23135894. [Online]. Available: https://www.mdpi.com/1424-8220/23/13/5894.

Some researchers have utilized hybrid sensor systems to recognize sitting postures. Haeseok Jeong et al. [25] proposed a hybrid sensor system consisting of six pressure sensors and six distance sensors placed on a chair. The collected pressure and distance readings were used to train a K-nearest neighbors (KNN) model for posture classification. Their results showed an accuracy of up to 92%. However, this method required the placement of distance sensors on the seat back, and the accuracy could be affected by users' body size and height. Haeyoon Cho et al. [18] developed a system that combined two ultrasonic sensors and 16 pressure sensors. The collected signals were processed by an Arduino board and then transmitted to the Naver Cloud Platform, where Convolutional Neural Network (CNN) and Lower-Balanced Check Network (LBCNet) were used for posture classification. The recognition results were displayed on an Android phone. Although the system achieved an accuracy rate of up to 96%, it required 18 sensors, resulting in relatively high hardware costs. In contrast, our SPRS (Sitting Posture Recognition System) uses fewer pressure sensors while achieving similar performance. SPRS is capable of classifying ten different sitting postures, as shown in **Figure 1**. For ease of comparison, **Table 1** summarizes the existing methods and SPRS. The detailed methodology and evaluation of SPRS are provided in **Section 3** and **Section 4**.

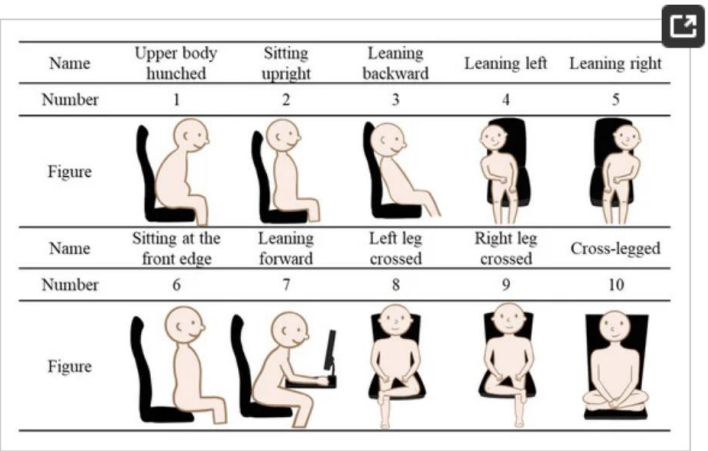


Figure 1. Illustrations of ten different sitting postures.

Table 1. Methods for recognizing sitting posture using pressure sensors.

[18] M. Jangi, C. Ferandez-de-las-Penas, M. Tara, F. Moghbeli, F. Ghaderi, and K. Javanshir, "A systematic review on reminder systems in physical therapy," *Caspian Journal of Internal Medicine*, vol. 9, no. 1, pp. 7–15, 2018. DOI: 10.22088/cjim.9.1.7. [Online]. Available: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5771354/.

Databases were searched until May 2017 and literatures were found from April 1992 until 2017. The literature recruitment strategy was based on applying several keywords and Medical Subject Heading (MeSH) combination running against title and abstract, including concepts such as reminder, physical therapy. The finally selected articles were categorized through reminder aspects such as how, who feedback. Data were extracted according to PRISMA guidelines.

Results:

In 47% of studies, the reminder was sent to the patients, 29% to the physical therapists and 12% to the caretaker team. In 24% of the studies, paper-based letters were main medium for reminders while the rest were various types of media like emails and SMS mobile text messages. 35% of the articles showed positive effects of the reminders.

Conclusions:

Many reminder methods consisted of SMS, phone calls, letters, emails and notices on the wall were used in physical therapy. Reminders may be used to improve patients' adherence to exercise programs.

[19] G. Calcagni, E. Caballero-Garrido, and R. Pell ón, "Behavior stability and individual dif- ferences in pavlovian extended conditioning," *Frontiers in Psychology*, vol. 11, Apr. 2020. DOI: 10.3389/fpsyg.2020.00612. [Online]. Available: https://www.frontiersin.org/journals/psychology/articles/10.3389/fpsyg.2020.00612/full.

How stable and general is behavior once maximum learning is reached? To answer this question and understand post-acquisition behavior and its related individual differences, we propose a psychological principle that naturally extends associative models of Pavlovian conditioning to a *dynamical oscillatory model* where subjects have a greater memory capacity than usually postulated, but with greater forecast uncertainty. This results in a greater resistance to learning in the first few sessions followed by an over-optimal response peak and a sequence of progressively damped response oscillations. We detected the first peak and trough of the new learning curve in our data, but their dispersion was too large to also check the presence of oscillations with smaller amplitude. We ran an unusually long experiment with 32 rats over 3,960 trials, where we excluded habituation and other well-known phenomena as sources of variability in the subjects' performance. Using the data of this and another Pavlovian experiment by Harris et al. (2015), as an illustration of the principle we tested the theory against the basic associative single-cue Rescorla–Wagner (RW) model. We found evidence that the RW model is the best non-linear regression to data only for a minority of the subjects, while its dynamical extension can explain the almost totality of data with strong to very strong evidence. Finally, an analysis of short-scale fluctuations of individual responses showed that they are described by random white noise, in contrast with the colored-noise findings in human performance.