ERGONOMIC CONSIDERATIONS: WHAT MAKES A "GOOD" GAMING CHAIR?

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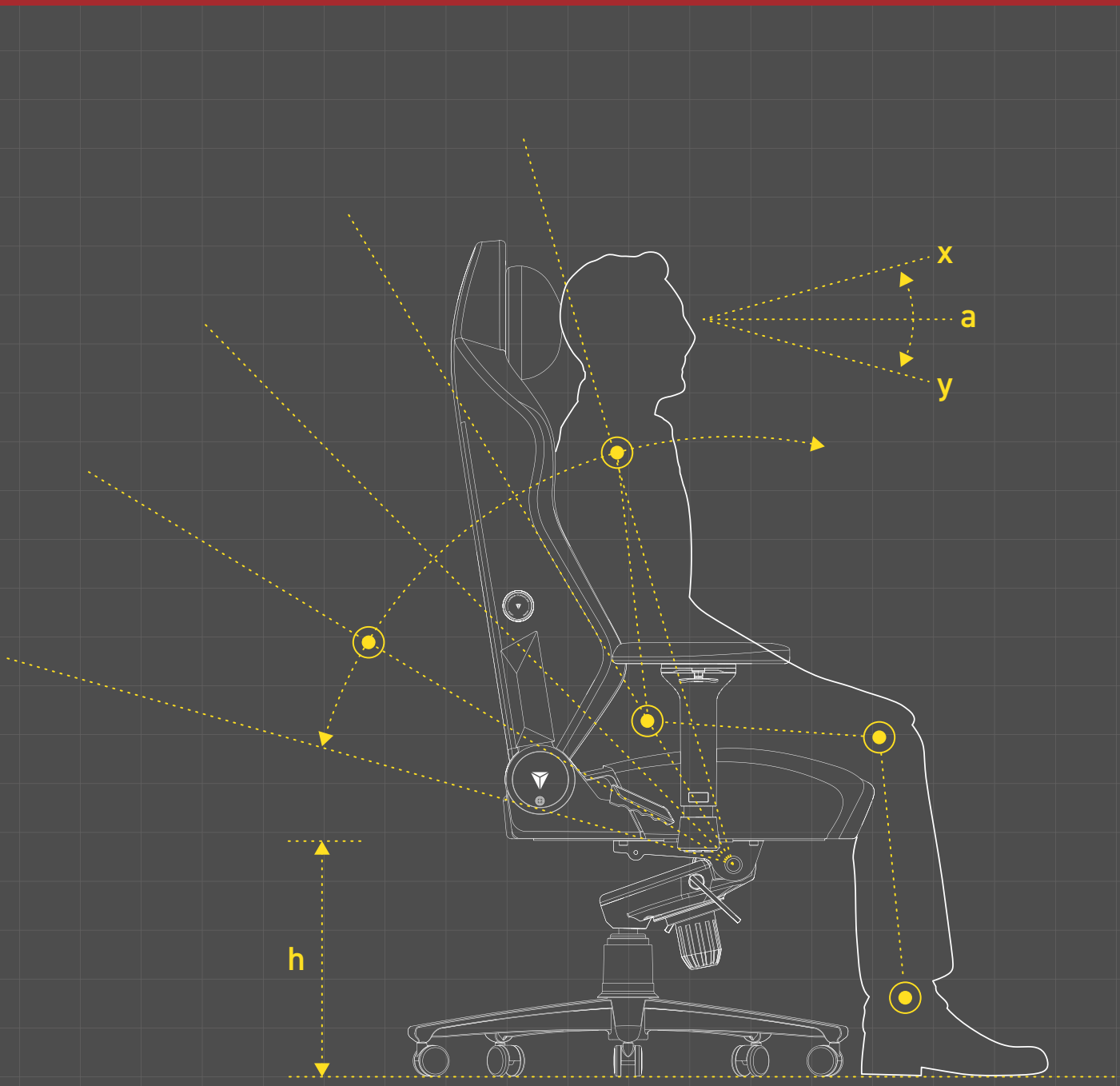


CONTENT

THE ROLE OF ERGONOMICS IN GAMING

As gaming and esports continue to grow, the standard of equipment and care similarly scales. Despite this, pain while gaming is incredibly prevalent, with 42% of collegiate esports athletes experiencing neck and back discomfort[1].

Ergonomics is singularly poised to address this concern by applying the science of design to ensure a pain-free, comfortable gaming experience. Nevertheless, the chair market is saturated with products without true attention being paid to what specifically makes a good gaming chair.

This paper will tackle the common causes of discomfort while seated and the chair components that can improve that experience.

Professional esports athletes at
the League of Legends Mid-Season Invitational.
Photo by LoL Esports from Riot Games

CAUSES OF DISCOMFORT WHEN GAMING AND HOW TO PREVENT THEM

Fig.1: Ischial tuberosities (red) are paired structures of the pelvis that bear significant weight when seated

> *Extended gaming sessions can lead to discomfort and pain arising from a multitude of factors.*

Where does body weight rest when sitting?

In a seated posture, the body's weight is supported via the feet and pelvis. The **ischial tuberosities** (Fig.1), known colloquially as the "sitting bones" are **paired structures of the pelvis** that become the main weight-bearing structures while seated. This becomes increasingly more pronounced when both feet are not placed firmly on the floor, commonly seen in gamers.

Muscles and tissue of the buttocks provide an extra layer of support as they are compressed between the bony prominences and the seat. This compression constricts blood flow to the region, which leads to numbness, discomfort and pain. "Seat pan interface pressure" has historically been used to measure this compression and refers to the relative body weight on the chair during sitting. Higher seat pressures correlate with increased discomfort, and serve as an indirect marker for evaluating the quality of a seat cushion.

FOAM VERSUS MESH: WHAT MAKES A GOOD SEAT

Chairs — and specifically seat cushions — designed with ergonomics in mind can have a significant effect on seat comfort. Commonly-available chairs are made from woven materials, foam or suspension mesh.

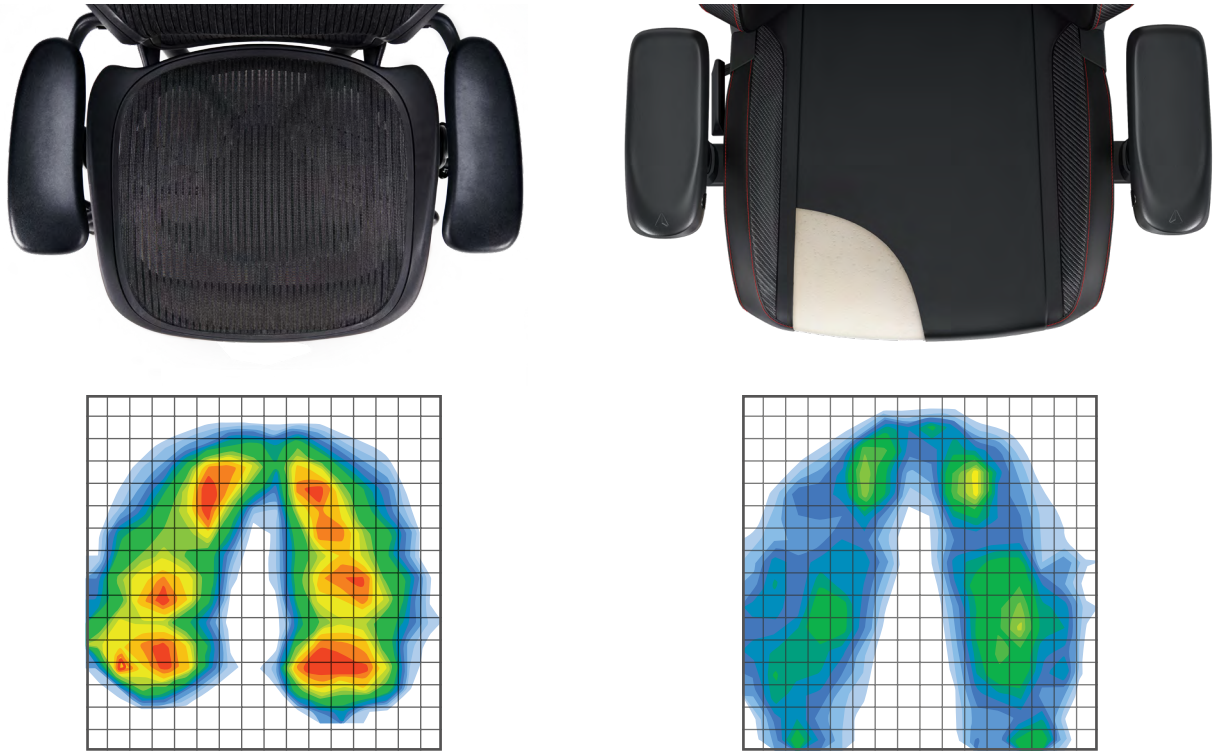


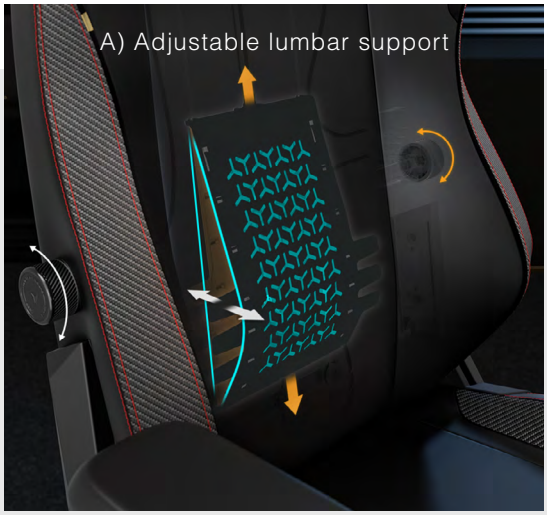
Fig.2: Seated pressure mapping of Mesh versus Foam chairs

In a direct comparison of pressures created by office chairs made of these materials, the lowest pressures came from foam material, while the highest pressure chairs were made from woven fabric or tensile mesh (Fig.2). Of the high-performing foam, seat depths ranged between 5.1 and 6.3cm^2. In addition to foam depth, **hardness also plays an important role in the pressure exerted and subsequent comfort.** Soft foam may initially have greater comfort, but can be affected by "bottoming out", which is a sudden increase in stiffness when pressure increases. As foam stiffness increases, this sensation is lessened[3].

OTHER CONTRIBUTIONS TO SEATING COMFORT

In addition to direct pressure, discomfort can also arise from static tension in the postural muscles (Fig.3). Maintaining an **erect posture requires constant activation** of the muscles of the spine. With prolonged sitting, these muscles begin to fatigue and can lead to discomfort.

Fig.3: Muscles of the back, abdomen, and pelvis work together to support posture



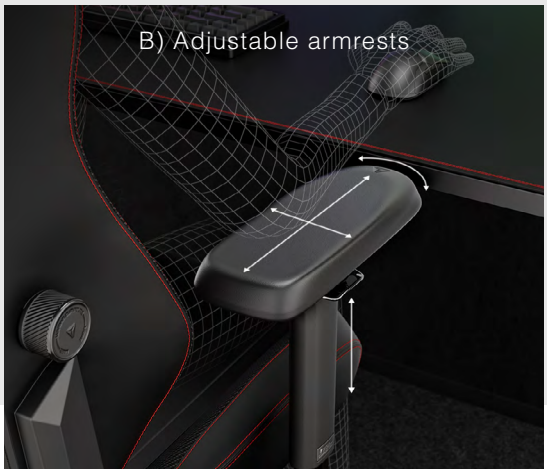


Fig.4: Secretlab's adjustable designs are engineered specifically to support the body

Adjustable Lumbar Support

Adequate lumbar support can alleviate this discomfort and decrease pressure on the spine[4]. Ergonomic chairs must, at the minimum, include lumbar support.

Adjustable Armrests

Adjustable armrests can also significantly impact a user's experience in their chair and lead to an overall increase in comfort.

Of note, the user experience can also be influenced by external factors, such as a guided walkthrough of the ergonomic features of a chair (Fig.4). Raters will reliably regard an ergonomic chair as less comfortable unless the specific components are meaningfully pointed out[5].

SUMMARY OF FINDINGS

Not all gaming chairs are created equally. Research shows that seats made out of foam result in significant decreases in pressure exerted on the body (Fig.5). Furthermore, chairs with lumbar support, adjustable armrests and accompanied by instruction on ergonomic features, lead to greater comfort and an improved experience overall.

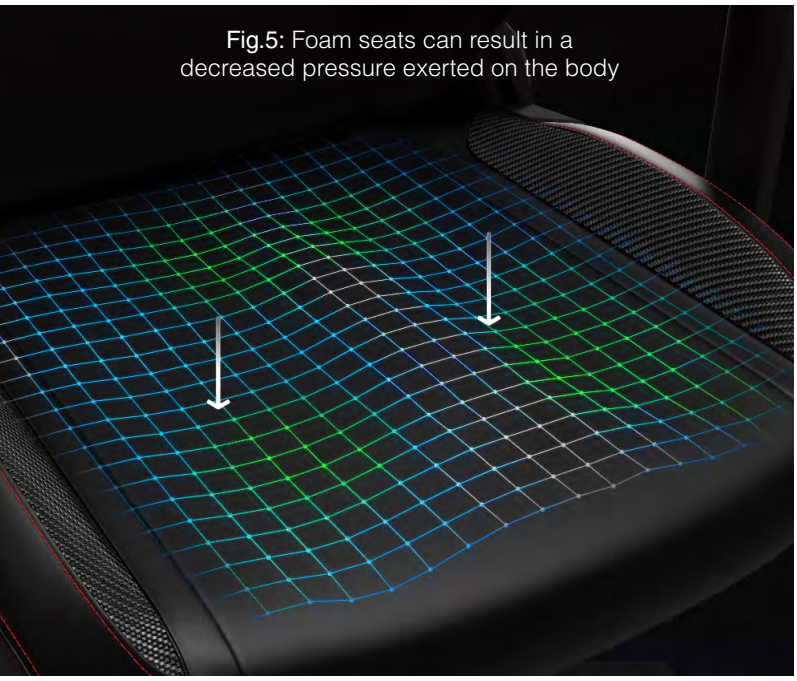


Fig.5: Foam seats can result in a decreased pressure exerted on the body

CONSIDERATIONS

Esports and gaming research remains in its infancy, with the attention of the scientific community just being cast upon the field. As a result, data is extrapolated from the ergonomic research in traditional office spaces, the automobile industry and wheelchair seating studies. Furthermore, seating studies are often performed in shorter intervals than what is often observed in gaming. Overall, more data — specifically on gaming chairs and in the appropriate population — will continue to be necessary to drive this industry forward.

> Gaming chairs, notably the Secretlab TITAN Evo 2022 contain high-density cold-cure foam formulated to a firmness level that provides **continuous support** to the user while **reducing discomfort** caused by excessive pressure upon the ischial tuberosities.
>
> The Secretlab TITAN Evo 2022 also comes equipped with **highly adjustable features** such as the 4-Way Lumbar Support System and 4-Directional Armrests. These are intuitive to use and offer **easy, customizable comfort** for an improved sitting experience.
>
> by Dr. Lindsey Migliore

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