Ergonomics

Five things to consider

When improving ergonomics with biological safety cabinets

Musculoskeletal disorders (MSDs) affect the muscles, nerves, blood vessels, ligaments and tendons. Laboratory workers are at risk for MSDs as a result of awkward physical tasks, repetitive actions, and more, including activities like pipetting and working in biological safety cabinets (BSCs). Ergonomics — fitting a job to a person — helps lessen muscle fatigue, increases productivity and reduces the number and severity of work-related MSDs.[1]

Interesting facts

40-80%
laboratory professionals have work related musculoskeletal disorders[2]

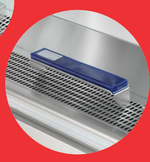
62.5%
of health personnel working in TB laboratory were found to have shoulder pain[3]

9.7%
of laboratory technicians were found with carpel tunnel syndrome[4]

1 Anchor your forearms

Place your forearms on the over-the-grill armrest, partially extended into the BSC work area with your elbow angled between 90 and 120 degrees. Haile, Taye and Hussen[5] recommend the use of armrests to provide support to shoulders in neutral positions.

Over-the-grill armrest (stainless steel)



Over-the-grill armrest with gel-filled padded armrests on top (available as accessory and replaceable)

2 Adjust your seat height

Set the height of your stool or chair, so that when seated, your forearm is comfortably anchored from Step 1.

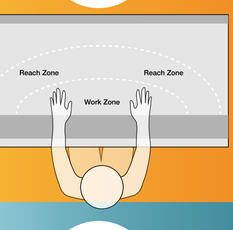
Cleanroom compatible, five legged saddle stool to help maintain an ergonomic posture

3 Support your feet

With the seat height set to allow proper forearm position, use a footrest if necessary to support your feet and allow your thighs to be generally parallel to the floor with your knee angled at 90 degrees or more.

Adjustable footrest as accessory (alternatively, footrests can be integrated into the BSC stand)

4 Organize for reach



Minimize contamination and ergonomic stress by organizing the BSC work area.

- **Work from clean to dirty** with clean materials on left side, primary working area in the center and waste disposal and finished product to the right for a right handed operator.
- Consider the **three levels of reach** within the BSC work area. The **work zone** shown to the left depicts the work zone where the average person can reach with elbows at 90 degrees. The **reach zone** is the additional area accessed when extending the elbow angle to 120 degrees. Accessing beyond the reach zone would require leaning forward and greater extension. Do as much as the physical and fine manipulation within your work zone, reaching required for the clean to dirty processing should not go beyond the comfortable reach zone.

5 Apply sharing best practices

Most biological safety cabinets are easily shared when working ergonomically. The BSC height can be set to accommodate the taller people within the lab and adjustable stools and footrests to support other users. In some cases, it may be helpful to consider electric stands in order to accommodate laboratories with a wide range of worker sizes.

Final Reminder – **Take breaks**. Shah et al suggest scheduled microbreaks of less than 2 minutes with light stretching.[2] When scheduling extended time in the cabinet, also plan for breaks.

References

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