



Wrong approach: wringing out microfiber cloths by holding the hands next to each other horizontally. Here, the moisture is pressed out by the twisting action of both hands and the rotation of the underarm. This overly strains hand joints, which have to bend into an unnatural position. This creates unnecessary stress that can cause health issues.



That's better: one hand above the other for wringing helps the twisting and pressing action to squeeze out more moisture. Here, the arm muscles do all the work, preserving the hand joints and keeping them from bending at an unnatural angle.

Photos: Peter Strauch

## The ergonomics of cleaning

# Preventing pains and strains

**Muscular and skeletal disorders (MSDs) are among the leading causes of work disability. Cleaners, especially, are at risk: no other professional group shows a higher incidence of injury-related work-loss days – with a dramatic impact on the bottom line. It doesn't have to be this way. Teaching your staff the ABCs of ergonomic procedures will help keep your business in shape in the long run.**

■ In 2009, the European Agency for Safety and Health at Work published a study entitled “The Occupational Safety and Health of Cleaning Workers”. An entire chapter is dedicated to the health of cleaning staff, focusing specifically on muscular and skeletal disorders (MSDs). Bad habits and improper movements during typical cleaning activities are typical causes. Compounding the strain on the body's muscular and skeletal system are the risks associated with heavy lifting and carrying, repetitive motions, and frequent twisting of the upper body. All too often the inadequate ergonomics of cleaning tools and equipment as well as machines are to blame as well. Clearly, the way we work must be better adapted to where we work and we what do.

### Building cleaners lead work-loss day statistics

A thorough analysis of sick leave slips issued by doctors revealed an alarmingly high number of muscular skeletal disorders and the resulting absences for health reasons. This transpired clearly from an article in the September 2012 issue of the BKK Fact Review ([www.bkk.de/faktenspiegel](http://www.bkk.de/faktenspiegel)). Among commercial and residential cleaning professionals, which includes building cleaners, BKK – one

of Germany's largest health insurance companies – registered the highest number of sick days for all BKK members taken together in the health and social sectors. From 2011, the number of work-loss days rose by 1.8 to an industry average of 25.6 absence days for health reasons in 2012. The most common reason for sick leave days for all BKK members: muscular skeletal disorders.

For this reason it is important to train staff in the proper use of the any cleaning equipment or machines required for their tasks, especially from the perspective of safety and health. This includes, for instance, making sure to keep the back straight when mopping a floor, and keeping the upper body from twisting to one side when leaning forward. Just wringing wet cleaning cloths with two hands, one positioned over the other one – instead of intuitively doing it with both hands together horizontally – is a big step in the right direction of ergonomic working.

### A fresh concept for positive behavioral change

One effective measure in promoting change in the behavior of cleaning professionals is a training concept called “Ergonomics at work: Building awareness in building cleaning.” The program is



Cleaning a horizontal surface: with the wrong posture, the back is twisted sideways and the upper body has to lean forward. This creates additional stress on spine and discs. The arm is outside the optimum grip range.



That's better: the back is straight, small wiping motions towards the body are used to clean the surface. Important: support yourself with the other hand. This reduces strain on vertebral discs from leaning forward. Also: frequently switch hands for wiping.

largely based on findings of the “Promoting health in hospitals - Cleaning” project and the EU-sponsored “Risk in Cleaning” project conducted between 1996 and 1999. In developing “Ergonomics at work: Building awareness in building cleaning,” Prof. emer. Elke Huth (then with the Hamburg University of Applied Sciences)

worked with Dr. Michael Peschke (Work Medicine Services, City of Hamburg), Dr. Andreas Dittmann (State Accident Fund Hamburg), the Hamburg State Insurance Agency), the City of Hamburg Betriebskrankenkasse, the State Hospital Agency, and the District Agencies of Harburg, Altona and Wandsbek (more on the thinking



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## “Ergonomics at work” – an effective training concept

### Six steps to success

The training concept “Ergonomics at work: All the right moves“ starts with a captivating video to set the stage before going into each of the relevant aspects in detail.

They include selecting the right handle length, what to keep in mind when cleaning vertical and horizontal surfaces, the correct posture for damp or wet mopping, using single disk polishing machines and vacuum cleaners, and making sure the skin is adequately protected.

Also in the training toolbox: wooden blocks and visual aids that illustrate the correct and the incorrect posture and motions for a wide range of cleaning activities based on everyday experience.

The training program consists of the following six learning units:

- ▶ 1. Physical and physiological basics: these concepts are taught using wooden building blocks that can be arranged and rearranged into various figures.
- ▶ 2. Body perception: through collective exercises the participants experience first hand the physical and physiological effects discussed previously.
- ▶ 3. Honing observation skills: the goal here is to differentiate between the various body attitudes and to verbalize them. The participants are given a standardized guideline to evaluate the various postures.
- ▶ 4. Practical exercises: participants practice the various ergonomic work procedures and workflows.
- ▶ 5. Implement action: participants bring together their findings and translate them into real action plans.
- ▶ 6. Motion training at work: multipliers within the organization support the participants in their daily activities and help them avoid incorrect postures and motions.

behind “Ergonomics at work: Building awareness in building cleaning” in the box on this page). In parallel, Elke Huth authored a brochure entitled “Ergonomics at work: All the right moves), published by the Protestant Agency for Workplace Safety and Health). The brochure, first published in 2004, was completely revised in 2012 ([www.ekd.de/efas/449.html](http://www.ekd.de/efas/449.html)). Together with Dr. Andreas Dittmann (State Accident Fund Hamburg) and Dr. Michael Peschke, Head Physician of the City of Hamburg, Elke Huth authored the brochure “Creating healthy work conditions.” The brochure published by the State Accident Fund Hamburg can be downloaded here: [www.uk-nord.de/fileadmin/user\\_upload/pdf/publikationen/gestaltung\\_gesunder\\_arbeitsbedingungen.pdf](http://www.uk-nord.de/fileadmin/user_upload/pdf/publikationen/gestaltung_gesunder_arbeitsbedingungen.pdf)).

### Room for improvement: mop handles

But what does “ergonomic” really mean? Perhaps it’s easier to explain by giving an example of something that clearly isn’t ergonomic: your run-of-the-mill mop handle for wide mop covers,

Wrong handle length: the length of the handle should be adapted to the user’s height to ensure healthy and comfortable work motions. The handle is adjusted correctly when the end is at about neck height. Adjusting for a perfect fit is easy with telescopic handles.



usually made of aluminum, 140 centimeters long and not height-adjustable. Here, “ergonomic” means easy to keep comfortably at close range, and swish from side to side without having to lean forward or straining the back, whether you’re small or tall. That standard aluminum handle is far from fitting the bill. Replace it with a telescopic shaft, however, and, and you have ergonomics at its best.

### Tall and small at a disadvantage

With a long handle, when the mop is used by an individual of smaller height, the distance between the mop and the user’s feet is too wide. The effort that goes into moving the mop across the floor is greater by several orders of magnitude than if the mop were kept closer to the body. This additional effort is completely unnecessary with the right handle length, one adapted to the user’s height.

If the person doing the mopping is on the tall side, and the handle is too short, he or she has to lean forward to drive the handle with the other hand. This forward leaning motion creates additional strain on the spine – there is roughly twice as much pressure on the vertebral discs than when standing erect.

Other ergonomic considerations that come into play as far as the handle is concerned are weight, thickness and the material used for the grip. The weight of the mop holder is important as well. The heavier the whole system is, the greater the effort necessary for effective mopping action.

### Height-adjustable grips on the cleaning trolley?

One key criterion with cleaning trolleys is the height at which the vertical or horizontal wringer is installed. The object here is to avoid any unnecessary forward leaning motion of the upper body. There are only a few cleaning trolleys on the market that feature height-adjustable grips. This problem has been solved more effectively with single disk cleaning machines. Here, the adjustable



Wrong: Here, we see that the back is twisted markedly to the side and the upper body is leaning forward. This creates additional strain on the spine and vertebral discs, which should be avoided.

Photos: Peter Strauch



Right: The back is straight, and the upper hand encloses the end of the handle in such a way that the palm faces the midriff. The handle is held not too firmly so that the top hand doesn't follow the movements of the lower hand. The lower hand holds the handle at hip height – palm facing the waist – and exerts the mopping motion with gentle pressure.

shaft means the machine can be adapted to the operator's build (at waist level). That being said, these machines have a major drawback – they are still quite heavy and should be lighter and more compact. This would make it that much easier and quicker to get them from one area to the next.

Mops and wringers offer great potential for improved ergonomics as well. Take the different presses or wringers for mops, for instance. With a vertical press, only the covers get wrung out. With a flat press, by contrast, many work steps that usually take a heavy toll on the body become unnecessary, like bending over frequently to grab the mop, and manually rinsing and wringing the covers in the waste and clean water buckets. No more mounting and taking off mop pads either, because the flat press is designed in such a way that the pad goes into the press together with the holder and handle. Nowadays, some trolleys can even go up and down staircases. No need to lift the trolley from landing to landing because the architect omitted to plan in a storage room on each floor. The important thing is to get a handle on which cleaning equipment

is best suited for the specific cleaning tasks in a specific location. Machines should be operated in such a way that the motions involved can be executed in the most ergonomically safe and sound manner. Prior to starting with the cleaning, the staff should receive appropriate training to ensure correct body motion and posture right from the outset.

It all comes down to internalizing new information and adapting behavior accordingly. Behavioral changes require constant coaching, so that bad habits are forgotten and good ones formed. Prevention is an investment, but sick leave days are just costs.

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## The ergonomics of cleaning

# Small effort, big return

There are compelling reasons for building service providers to make ergonomics an integral part of their business strategy and day-to-day operations. That's the theory. But what about practice? Service providers share their insights.

### ► Thomas Rosenke, General Manager, Karo Building Cleaning, Hamburg

From our perspective, never before has it been so important to ensure efficient workflows and at the same time protect our people from health risks, especially those resulting of long-term repetitive activity. In this sense, ergonomics takes on a very special meaning in terms of ensuring preventive workplace safety, but also in terms of its economic and social impact. It for this reason that our founder Sylvia Warner emphasized an ergonomic approach in defining and developing workflows and procedures right from the outset. Already in 1998 we integrated workplace, health and environmental protection into the certification of our quality management system under DIN EN ISO 9001. Take the upgrading of our broad wipe utensils to telescopic handles, for instance. This is just one example of how we turn ergonomic theory into practice. The new system considerably reduces strain on the shoulder and neck area because the handle height can be adjusted to body height. Naturally, you also have to accompany this process with good coaching. At our internal training center, we not only thoroughly familiarize our staff with new cleaning equipment and machines, but also explain the health risks associated with the incorrect movement or posture. Acceptance is high and our employees also appreciate the attention and respect we give them by offering these courses. Fact is, workplace health and safety is far from a given in

all companies and organizations in the 21st century. From a business standpoint, it should also be said that the extra costs of equipping our mops with telescopic handles compared to conventional handles are offset by much lower work-loss costs because we have fewer absences due to work-related injuries or illnesses. A close analysis of our sick leave statistics and data made available by German health insurers shows that shifting over to the new handle type alone has resulted in a reduction of the number of muscular skeletal disorders. This pretty much proves that the investment in ergonomic tools and equipment is also an investment in the health of your staff.

### ► Petra Kasten, Unit Head Special Projects, Training and Continuing Education, Interior Building Cleaning, Tereg Facilities Services, Hamburg

As an employer with high social standards, we strongly believe in making working conditions as employee-friendly as possible, despite physically demanding work and a very competitive business environment. In this context, we are particularly sensitive to the issue of ergonomics. Since 2005, we have been actively applying the precepts of the "Making the right moves" ergonomic training concept. Every new hiree receives thorough workplace health and safety training, which also includes the use of personal protection equipment as well as ergonomically designed equipment and how

to operate it. The ergonomically correct way of doing things is conveyed visually and explained in clear concise terms on posts throughout the premises. Our department heads, runners and supervisors take part in annual ergonomics refresher courses. In addition they receive training in how to effectively transmit their knowledge to those they work with. "Since I started working the way you showed me, I no longer have back pains," said one seminar participant. That kind of feedback is very gratifying and it motivates you to keep on doing better. Many colleagues are very receptive to good advice, especially when it makes a difference. We can't really measure the success in money terms, but we are pretty certain that absences due to injury or illness would be much higher if we didn't implement these activities throughout our company. It really should be a no brainer for any employer to use the tools and technologies and practices available today, and keep employees trained and qualified. After all, only healthy employees are able ambassadors of a business.

► **Karsten Fellner, Head of Application Engineering, Dornier Group, Nuremberg**

"Quality for people and buildings" – that's the motto of the Dornier Group and it pretty much guides us through our everyday activities. We put the individual at the center of our thoughts and actions, and that means emphasizing health. Ergonomics are especially important in the building cleaning sector: repetitive, shifting physical efforts, restricted motion ranges as well as having to work with heavy and unwieldy cleaning machines – these are typical aspects of an average workday for our cleaning staff. Every day our colleagues are expected to perform at their best, and the physical demands just keep increasing every day.

It is for these reasons that the Application Engineering team concerns itself with continuously improving workflows and procedures, developing more effective and more ecofriendly cleaning solutions as well as technical innovations, and optimizing the ergonomics of the work environment. All of these components are addressed by our Dornier Modular System. Here, our multifunctional cleaning trolley is just one example. It features an individually configurable drawer system with retractable buckets and ergonomic grips. And because it is so lightweight, moving it around costs much less energy, which results in less fatigue. Everything is neatly stored in its rightful place and easily accessible. That saves valuable time and effort during setup and cleaning. The goal is to keep easing the workload on our staff, and we are making progress all the time. In fact, our experience shows us that investing in new cleaning and machine technology, ecofriendly products and ergonomic tools and equipment pays dividends. Over the long term we have been registering fewer injury or illness-related absences, and at the same work is getting done faster. What we especially value is the feedback we get from our employees. In a constant dialogue, you can actually change things for the better and constructively remove any obstacles along the way. ■

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