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A Safe and Helpful Lift

By: Andrew D'Cruz

Lifting is a common workplace task that seems tailor-made for injury. Picking up a load that is just a few kilograms too heavy, reaching just a little too far forward, carrying something just a bit over the head -- with workers doing any or all of the aforementioned, day after day, it's little wonder that musculoskeletal injuries are so common.

Indeed, Ontario's Ministry of Labour reports that 2007 saw more than 35,000 workers suffer a musculoskeletal disorder, accounting for 43 per cent of all lost-time claims filed with the Workplace Safety and Insurance Board. The claims prompted the ministry to launch a musculoskeletal injury safety blitz in April.

When a worker ends up with a lifting-related injury, says Calgary-based ergonomist Diane Stinson, usually a combination of factors are to blame. "When we look at the risk factors for injury, we're looking at the repetition, the force, the duration, the use of non-neutral postures or if there's any vibration involved," says Stinson, who is also the founder of HealthWorks Ergonomics & Injury Prevention Consultants.

Other factors include the work environment's moisture and temperature, and even the worker's general fitness. Employees who are less fit tend to get fatigued, sometimes resulting in poorer lifting techniques, she points out.

In a number of companies Stinson has worked with, "fitter employees were the ones that were more effective, they weren't getting as fatigued doing their job," she says. They also were not getting injured as frequently, but if they did, were recovering far more quickly.

"Most of the research talks about it being a multiplicative factor," explains Stinson, whereby the chances of injury increase exponentially as new risky behaviours are brought on board.

CHOICES ABOUND

That may be why there is such a wide range of devices designed to reduce or minimize lifting hazards. Lifting devices can be found in just about any type of workplace where lifting is an everyday part of the job, with lift tables, pallet lifters, dollies, lift trucks and portable lifting transporters used to help get materials where they need to be.

In both the food and the pharmaceutical industries, suggests Hans Lofgreen, owner of Toronto-based Jenalex International Trade, lift trolleys are often used to move boxes, bags and plastic rolls. Below-the-hook lifting devices, with their high-weight capacities, are found in a range of manufacturing environments, Lofgreen says. But even in non-industrial workplaces, such as office environments, devices including dollies and lifting transporters are used.

Many product categories have been around for a long time, says Maria Del Grosso, product manager for material handling at Tenaquip Limited in Montreal. But there is a growing realization on the part of employers, suppliers and manufacturers that lifting devices are actually safety equipment -- not just elements in an industrial process, Del Grosso says. "It's a totally different way of looking at the product," she suggests.

ON THE LEVEL

One of the most useful devices to reduce strain on the back, neck, arms and legs is one of the least imposing -- the humble lift table. While many options are available to suit a wide range of applications, at its core a lift table is a horizontal platform sitting atop a pair of scissor-style legs that can be raised or lowered by hydraulic or battery power to the required height for a given task.

"They're there to aid the individual in his job in a particular workstation," says Jim Gibson, a sales manager at Trans- Quip Inc. in Grimsby, Ontario. "They support, they add comfort, they prevent injury," Gibson says.

As an example, he points to a recent set-up he helped design for a food processing company. A worker was transferring food from boxes into a packaging machine. The problem? The pallet carrying the boxes was being unloaded at floor level, but the worker was standing on the mezzanine, located about 70 centimetres above the floor.

The worker "was walking down the mezzanine, picking up boxes and bringing them back up," Gibson reports. "He was doing this all day long" -- a recipe for injury, he suggests.

Gibson proposed installing a lift table at floor level to raise the boxes up over the mezzanine's metre-high handrail. That allowed the worker to "continuously pull [boxes] off the pallet and feed the packaging machine," making the task more ergonomically sound and more efficient.

Stinson has had similar positive experiences with clients. At a large printing company, she says workers in the bindery area faced "extended reaches and either forward or vertical reaches." Stinson suggested the employer drop a lift table down into the floor so it was at a height "that [employees] could work at, they could adjust it and it was always at a good range for them."

Just what lift table to buy depends, of course, on the application. Working in a dusty environment? Gibson suggests considering bellows skirting to keep the leg assembly clean. Need to bring the table all the way down to the floor? Trans-Quip advises considering a special model equipped with legs off to the side and the middle recessed to meet the floor.

Other helpful options include smaller, lighter-duty lifts (with 200-kilogram capacity), plank-shaped tabletops, casters, wheels and user-programmable preset automatic level adjustment.

Positioning a load correctly is essential for all kinds of lifting tasks, whether or not that load is particularly heavy. Imagine reaching down into a deep box each day to extract pieces of mail. Fairly soon, says Del Grosso, the strain will make itself felt on the back, neck and arms -- which is why postal services have widely adopted use of container tilters. These allow a worker to set the angle of a box or container.

Gibson notes that tilters are also "used quite a bit in the pharmaceutical industry where the person is sitting right there filling up boxes and placing them in a bigger box." The option allows a worker to remain seated instead of bending down over the side of the container tens or even hundreds of times an hour.

ON THE SURFACE

A sort of first cousin of the lift table, the pallet lifter is relatively new in Canada. These devices are designed for shipping and receiving departments where pallets loaded with boxes and bags are ubiquitous, like the musculoskeletal injuries that can accompany their loading and unloading.

Usually, workers removing goods have to bend down as the stack grows shorter. A lifter eliminates the need for deep bends since the device raises itself up as each item is unloaded, says Gibson. "It's a system of gravity," he says. "As the weight is depleted off those pallets, the springs decompress, and it continues to raise that pallet upwards."

On top of the lifter is a rotating ring that allows the worker to load or unload from a single position when need be, speeding up the work and reducing strain on the legs.

For more complex pallet-lifting operations, Gibson and his colleague, marketing coordinator Rebecca Abrey, both point to pallet rotators/inverters that literally flip a pallet onto its head. What would be the need?

Imagine a pallet that is ready to be shipped, but has a box at the bottom that is damaged. "Normally, you would have to have a worker go in, unload that whole pallet, take everything off, pull out the broken one, put a new one on, and reload the pallet," says Abrey. With the inverter, she says, that lengthy process is eliminated and the replacement made easier.

HEAVY DUTY

As the weight of a load increases or its shape becomes less regular, lifting under one's own power becomes less and less attractive. Unloading a pallet of 10-kilogram boxes is one thing; unloading a pallet of 40-kilogram bags quite another. At this point, perhaps it is best to look up -- way up -- for an overhead or "below-the-hook" lifting device.

Descending from a hoist, crane or rails on the ceiling, these devices can use a magnet, vacuum, clamp, hook or other device to lift loads ranging, as lifting consultant Scott Davenport puts it, from "50,000 pounds down to an egg." Many such devices are available, but as usual, choosing the right one comes down to the job that needs to be done, says Davenport, president of SWD Enterprises Inc. in Mississauga, Ontario.

Vacuum lifts work on a simple principle, says Fred Pinkerton, vice-president of sales for Conveyerail Systems Inc. in Richmond Hill, Ontario: a blower at one end of a tube creates a vacuum, which is used by vacuum cups on the other end to grip a load. The actual lift is made possible by a small valve in the tube.

As the valve is closed off, Pinkerton says, the force of the vacuum increases, just as when the opening of a running vacuum is covered with the hand. That extra force makes the tube contract like an accordion, lifting the load, he adds.

Pinkerton notes that the food industry is a big client for vacuum lifts. In a bakery, for example, a worker may have to lift bags of flour, sugar and other ingredients off a pallet, carry them to a mixer, lift them to an opening at shoulder height and cut them open.

"That's one of the worst ergonomic situations out there," he suggests, particularly because unlike boxes that stay rigid, lifting a bag "is like picking up a limp cat."

Jenalex International's Lofgreen is also seeing increased use of mechanical lifting devices in the food industry after years in the automotive world. Such devices, Lofgreen offers, are particularly suited to those situations where "you'd like to have a robot, but you can't," as when the items to be lifted are not coming from or going to "the same spot all the time."

The system is made up of an arm with one of 50 "end effectors" that descends from a support structure. Once the arm is grasped, Lofgreen explains, "it doesn't matter how quickly you move the handle, the whole thing will follow your hand." The unit employs sensors to effectively increase a person's lifting capacity by several orders of magnitude.

But Lofgreen cautions the systems are not ideally suited for all heavy lifts. "It's for when you are lifting things every 15 seconds, every 20 seconds, every 30 seconds and so on," he says. "If

you're lifting something once or twice an hour, then it's not cost-effective and you go to some other type of hoist."

Davenport points out it is important to ensure any system that's being considered meets the regulatory requirements governing such devices -- which differ slightly in each province -- and meets any related American Society of Mechanical Engineers (ASME) standards that have been developed.

Of particular importance is the "design factor," which indicates how much more weight a system can withstand above its rated capacity. The ASME standards require below-the-hook devices to have a design factor of 3:1 (in Ontario, for example, that factor is 5:1).

CARRY ON

In an average day, of course, boxes don't just need to move up and down. They need to move left, right, forward and backward, too. And walking with a heavy load can take a toll on the back.

Fortunately, there's a range of equipment -- from simple dollies to lift trolleys, stackers and newer portable lifting transporters -- only too happy to bear the weight.

For many work sites, forklifts -- the ultimate lift-and-move devices -- outlive their usefulness once they reach the door, suggests Tenaquip's Del Grosso. Too big, too expensive and too heavy-duty, forklifts are simply not the best fit for lighter-weight boxes, bags and rolls workers may need to carry.

Consider, for example, a food company where finished product comes out of an assembly line ready to be wrapped in plastic, Lofgreen points out. "That plastic comes in the form of a roll that may weigh 100, 200, 300 pounds," he reports. Workers "have to take that roll, hand bomb it six feet up in the air or very low down on the floor and bend their backs or their knees -- it's really brutal," he adds.

Instead, Lofgreen suggests using a lift trolley with a squeezing attachment that will grasp the roll and manoeuvre the load to the required height.

Lift trolleys and stackers come in many specialized configurations, from clean-room safe stainless steel trolleys with electrical power to hydraulic, 1,000-pound capacity stackers.

A versatile option for a range of workplaces -- from factories and warehouses to offices and retail outlets -- is a portable lifting transporter. Essentially a lift table on wheels, these devices have a capacity of anywhere from a hundred to a couple of thousand kilograms. "They're easy things that people can put into their environment that are cheap and safe and are really going to help people out," Abrey says.

Overall, employers are starting to apply the whole range of lifting products to lighter-duty situations, says Del Grosso. "Just looking at these products from an ergonomic standpoint is new," she suggests.

Abray adds of employers, "sometimes they don't see this as a need." But with just a little education, she says the right lifting product "opens their eyes up, and they do see how bending a hundred times in an hour has been affecting their workers."

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