

Ergonomics in the Pressroom

Pressroom work can involve the danger of cumulative trauma injury problems. Cumulative trauma injury is a major concern in repetitive production tasks. Seating a person at a press hand loading parts in the same way day after day is a poor practice. Good cellular design with rotation of tasks varies motion patterns of the hands and varies positions from sitting, standing and walking. The efficiencies achieved in good work cell design and cellular manufacturing can be an opportunity for beneficial exercise rather than repetitive motion leading to cumulative trauma injury,

A thorough discussion of personnel safety and avoiding cumulative trauma injury is beyond the scope of this discussion. A few examples of how manufacturers strive to avoid cumulative injury to pressroom personnel are considered. The best solution is to automate repetitive tasks that cause repetitive motion cumulative injury.

There is no reason why pressworking operations should inevitably result in human injuries. Modern stamping shops have impressive safety records for avoiding lost time accidents. Modern press controls, automation, and proper guarding of machinery have nearly eliminated the accidental amputations and severe lacerations that were once accepted as an inevitable result of pressworking operations.

In the United States, government-mandated hearing conservation programs have resulted in a remarkable reduction in hearing loss caused by the cumulative effects of exposure to high noise levels. Cumulative trauma injuries are avoidable through common sense manufacturing practices.

Carpal Tunnel Syndrome

This is a common cumulative trauma injury to pressroom workers. It involves excessive pressure being placed on the median nerve where it passes through the wrist. The pressure is caused by a swelling of the tissue within the wrist. One cause of this swelling is repetitive wrist flexure. The result is numbness of a portion of the hand. If untreated, permanent loss of feeling and function can result. To help avoid this problem in the pressroom, a number of measures can be helpful. Changes in work rules may be needed in some cases. The measures include:

- Using low force mechanical switch-type palm buttons. Make sure that newer types actuated by capacitive proximity switches or by interrupting an infra-red light beam cannot be actuated by stray radio signals, moisture or a damp dangling sleeve.
- Designing the repetitive task so that the operator maintains a neutral wrist position.
- Rotating workers between tasks.
- Automating jobs where possible.
- Using sensors for progressive die protection so the press does not need to be single-stroked by an operator.

Other measures can be quite innovative and improve the overall efficiency of an operation. For example, when a number of small knee or OBI press dies are required to produce a part, consider mounting them on common subplates and running the job in a straightside press. This will have the effect of varying the types of hand movements required. A second operator can also work on the other side of the press with the appropriate safety controls. This can have the added advantage of increasing productivity while eliminating the problems associated with workbaskets and tubs in the process of completion.

Back Injuries

Industrial workers have been shown safety posters for decades, which show the correct way to lift heavy objects. The proper way is to keep the back straight and lift with the legs. The object of correct lifting is to avoid a gradual deterioration or sudden failure of the disks in the spinal column. Figure 1 illustrates a section of a normal back and disks.

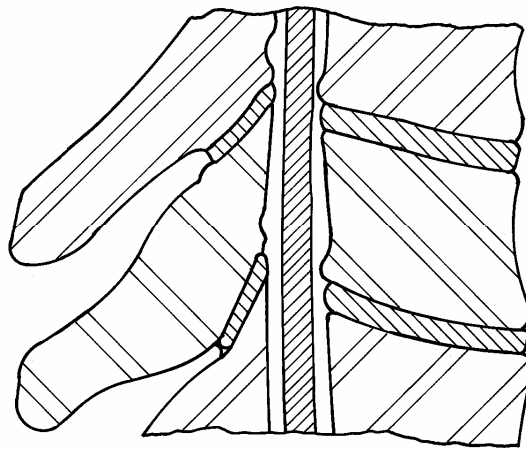


Figure 1.

Disk failures (herniation or rupture) are quite painful and can result in paralysis. However, improper lifting is not the only cause of back injuries. Some other causes are:

- Accidental falls that place a sudden compressive shock on the spinal column.
- Lifting weights that are excessively heavy.
- Excessive repeated forward bending.

Most pressroom injuries are avoidable and back injuries are not an exception. The illustration shows how the most common serious industrial back injury, a herniated disc, occurs. The *disk* functions to separate the bones known as vertebrae and provides flexibility to the spine. As shown in Figure 2, the disk consists of a hard outer layer and a jelly-like core that can bulge from excessive loads, especially if repeated.

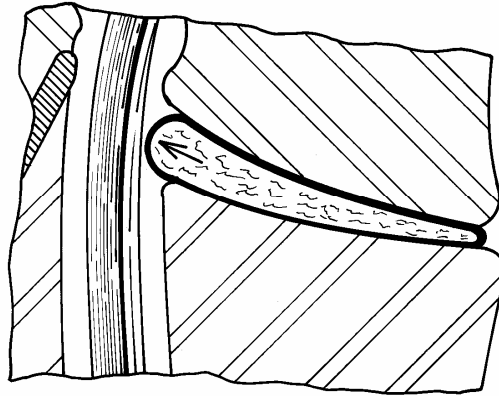


Figure 2.

The hard outer layer must withstand the hydraulic-like pressure of the jelly-like inner substance. The pressure tends to be proportional to the loading on the spinal column. Extreme pressures caused by a fall or extremely heavy lifting can cause the hard outer layer to fail as is shown in Figure 3.

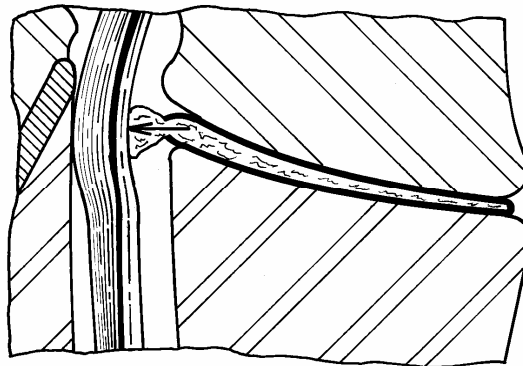


Figure 3.

This is much the same as the failure of a hose caused by the application of excessive pressures. Disk failures, like hose failures, occur because of extreme sudden overloading, chronic overloading, or excessive cyclical loading which is analogous to excessive repeated forward bending. The disks, like a rubber hose, deteriorate with age; so older workers are more susceptible to such back injuries than younger workers, all other factors being equal are.

Avoiding Back Injuries

There are many ways to avoid industrial back injuries. For example, work rules must take into account the fact that certain classifications such as diemakers may occasionally

need to use power equipment to move heavy objects, even though they are not classified as power equipment operators. The availability of hydraulic lift tables and battery-powered transporters, as well as the occasional use of a fork-truck, should be permitted for any classification needing them as an alternative to heavy manual lifting.

The education program should emphasize the mechanical function of the spine and associated ligaments and muscles. Avoiding sudden or chronic overload damage should be repeated frequently as part of the safety education program.

Implement Ergonomic Improvements

Ergonomic improvements should be implemented wherever feasible. Usually the improvements are simple and low in cost. The employee doing the work should be involved in finding ways to make the job easier. Apart from humanitarian concerns, making the job less stressful usually increases productivity.

Lifestyle off the Job

It does little good to work for a company that follows the best industrial safety practices if this is not followed with a healthy lifestyle. Even though the writer has followed what is considered a dangerous occupation, that of a Die Tryout Leader in heavy pressworking for much of his career, it never killed any of his coworkers. What killed them other than age related factors were excessive alcohol consumption, motor vehicle accidents, and a host of other life style related problems.

Excessive weight is a problem for many and the best exercise is shoving yourself away from the table when you have had enough varied healthy food to eat. Avoid fad diets.

Back and Joint Health

A reasonable appropriate body weight for your frame and height structure avoids overloading joints in the course of normal activities such as walking, standing, and sitting. Moderate running is fine for those who work up to this type of exercise and at their best body weight. Running to lose weight subjects the knees back and other joints to impact loading that can do permanent damage. We have only so much cartilage in our joints and if we wear it out it is gone.

Back injury can occur if the same practices advised in the workplace are not followed off the job. Use common sense when doing any activity that involves heavy lifting, repeated bending and working in awkward positions.

Hearing Conservation

Some hearing loss with age is common and affects nearly everyone as we reach retirement age. A normal person is born with hearing that has a threshold so sensitive that the random molecular movement of air in the ear canal almost can be heard. The term decibel (dB), commonly used refers to a sound pressure level, which must have a zero reference point to be meaningful. The term decibel as it is commonly used uses a sound pressure of 0.0002 dynes per square centimeter as the zero reference using "A" weighting. Thus, you may see the term dBa, which defines the reference accurately.

This pressure measurement is to approximate the frequency response of the human ear based on the work of Fletcher and Munson at Bell labs as published in 1933. The “A” weighting and reference point is so universally used that the term dB used in reference to sound measurements is typically assumed to make reference to the standard on which the term dBa is based.

Exposure to sound pressures of 90 dBa or more for extended periods will cause a person with normal hearing to experience a loss of hearing sensitivity or what is termed a threshold shift. Typical causes of recreational hearing loss include:

- Listening to music systems and performances at excessive loudness.
- Motor sports exposing participants to excessive sound pressures.
- Gunfire, especially rifle and pistol practice without wearing hearing protection.
- Exposure to power tool operation exceeding 90 dBa without hearing protection.

Conclusion

The human body is a very special creation of the almighty. We can make choices to work in an ergonomically safe way by cooperation with our employers who have a duty to provide a safe workplace which includes ergonomically sound practices. We have a duty to ourselves and our families to avoid injurious practices in leisure and household activities.

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