BULLETIN

HOLMES SAFETY ASSOCIATION

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HOLMES SAFETY ASSOCIATION MR. JACK SAFETY

November 1991

HOLMES SAFETY ASSOCIATION OPEN-PIT PETE

November 1991

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Please note: The views and conclusions expressed in HSA Bulletin articles are those of the authors and should not be interpreted as representing official policy of the Mine Safety and Health Administration.

KEEP US IN CIRCULATION

The Holmes Safety Association Bulletin contains safety articles on a variety of subjects: fatal accident abstracts, studies, posters and other safety-related topics. This information is provided free of charge and is designed to assist in presentations to groups of mine and plant workers during on-the-job safety meetings.

Welcome new members

NAME	CHAPTER NUMBER	LOCATION
Mitteis Gravel	9378	Royal, NE
Jarman Sand & Gravel	9379	Chambers, NE
Glenn R. Williamson	9380	Slaton, TX
Glen Roark Const. Co .	9381	London , KY
L & M Corporation	9382	Mt. Hope, WV
Roberts and Shaffer Const. Co.	9383	Poca, WV
Lin–Con, Inc.	9384	Wharncliff, WV
San–Con, Inc.	9385	Bellecenter, OH
Cole Sand & Gravel	9386	Emmet, NE
Larry's Sand & Gravel	9387	Chambers, NE
Troy Minerals	9388	Essex Junction, VT
K & K Hall	9389	Dalton, MA
Art Butler	9390	Springfield, MA
Western Maryland Council	9391	Frostburg, MD
Mastodon Sand & Gravel	9392	Deerlodge, MT
Chanute Cement Company	9393	Chanute, KS
Western Gravel, Inc.	9394	Montrose, CO
Morrison Gravel, Inc.	9395	Port Orchard, WA
Rv Associates, Inc.	9396	Port Orchard, WA
Kitsap Quarry, Inc.	9397	Olalla, WA
Pollock Redi Mix, Inc.	9398	Ewing, NE
Atkinson Sand & Gravel	9399	Atkinson, NE
Sandco, Inc.	9400	Durango, CO
Mountain Gravel & Const., Inc.	9401	Dolores, CO
Nielson, Inc. Double Cone #2	9402	Cortez, CO
Nielson, Inc.–Double Cone #1	9403	Cortez, CO
Mancos Valley Gravel	9404	Bayfield, CO
Colorado Marble Co.	9405	Carbondale, CO
Topper Coal Co., Inc. #6 Mine	9406	Pikeville, KY
Douglas Fawthrop	9407	Schroon Lake, NY
John Lucarelli & Sons, Inc.	9408	Mechanicville, NY
Nicky Coal Inc. #1	9409	Birchleaf, VA
Can Am 1	9410	Benton, AR
Wegner #1	9411	Mt. Ida, AR
Wegner #2	9412	Mt. Ida, AR
Foreman	9413	Foreman, AR
N & D	9414	Mabelvale, AR
RPBC Little Rock	9415	Little Rock, AR
Foreman Plant	9416	Foreman, AR
Halco	9417	Little Rock, AR
Arch Street	9418	Little Rock, AR
Liter's Quarry, Inc.	9419	Louisville, KY
Lyle Pospisil & Sons	9420	Creighton, NE
Kinney Branch Mining, Inc.	9421	Virgie, KY
Bass Energy, Inc.	9422	Bruceton, WV
Courtney Rock & Gravel	9423	Lynch, NE
Central Arkansas	9424	Little Rock, AR
Clinton Ready Mix/Quarry	9425	Clinton, AR
South Arkansas	9426	Wabbaseka, AR
Spanish Mountain	9427	Hot Springs, AR

Take time to eat right

Poor eating habits can have damaging consequences and affect job performance.

By Christine B. Vogel

Work backlogs. Deadlines. Your employees face these each day. Time pressures on the job often prevent employees from taking a break or a relaxed lunch.

Sarah Lindgren, a supervisor at Evanston Hospital in Illinois, says she can always tell when her employees haven't taken time for lunch. "They get irritable and stressed out, and they have a lot of trouble concentrating during the rest of the day."

Fast food is fat food

Supervisors whose employees routinely eat on the run are apt to find them sluggish and unable to tackle their work effectively. Employees who rush through lunch breaks tend to eat fast foods or prepackaged foods and snacks. These foods are convenient and filling. They're also high in fat, sugar, salt and calories.

While we usually associate our sugar consumption with a morning coffee-break donut or an afternoon candy bar, we also consume a great deal of sugar that we don't actually see—for example, the high fructose corn sweeteners used in soda pop and breakfast cereals.

Using artificial sweeteners in our daily cups of coffee may not be a solution, even though many believe they're a way to cut calories. According to a 6-year study conducted by the American Cancer Society, "hard-core" users of artificial sweeteners are more likely to gain weight, possibly because they feel that their artificially sweetened drinks and foods cancel out the other calories still being consumed at too great a rate.

While sugars that occur naturally in fruits and vegetables are the best kind—because those foods also contain vitamins, minerals and other ingredients essential to health—great amounts of refined sugars should be avoided. Foods high in refined sugar often have few vitamins and provide little more than empty calories.

Salty foods, which we often crave as snacks, also pose potential problems, since sodium has been linked causally with high blood pressure, swelling and fluid retention and also associated with heart disease and kidney malfunctions. Common snack foods, like potato chips and pickles, and cured meats, such as salami and corned beef, are particularly high in sodium. Ironically, salt is an acquired taste, says Mary Abbot Hess, a Winnetka, Illinois-based nutritionist and corporate consultant. "If you cut back on your salt intake, your taste buds retrain themselves in a matter of weeks," she says.

"People generally have poor eating habits," adds Mara Promisco, chief clinical nutrition specialist at St. Francis Hospital, Evanston, Illinois. "Even when a company cafeteria has a salad bar, many workers continue to eat fried foods. A salad or baked fish doesn't smell as good as fried chicken."

She also points out that while foods high in sugar and fat can generate an instant pick-me-up, they can also cause blood-sugar levels to drop off quickly. The result: energy levels fall and workers crave more high-fat, high-sugar foods.

Foods high in fat take longer to digest, says Cindy Rheingruber, community dietician at Glenbrook Hospital, Glenview, Illinois. That can slow down work efficiency and make employees more prone to mental errors and accidents. In addition, Rheingruber says that high-fat foods can lead to weight gain. Employees who are overweight are often at a greater risk of having cardiovascular problems, diabetes, strokes and back problems.

Eat well to stay healthy

On the other hand, employees who eat carefully tend to be in better overall health. They probably experience less on-the-job stress and absenteeism.

"Mealtimes should be an opportunity for relaxation and a change of scene," says Mary Abbott Hess, a registered dietician and corporate consultant. A change of pace allows time for people to decompress." She adds that it's also important to eat regularly. "If you eat on the run, you're not eating nutritiously because you probably don't eat three well-balanced meals."

She also points out that workers often substitute a cup of coffee for regular food when they feel rushed. Caffeine is only a mild stimulus if ingested in moderation, says Hess. Employees who drink 8-10 cups a day and don't eat regularly rob their systems of the protein and complex carbohydrates that help keep blood sugar at stable levels.

Snacks can be healthy

Some employees may feel that they don't have time to eat a full meal during the work day. According to Evelyn Tribole, a registered dietician and author of "Eating on the Run," workers can snack throughout the day as long as they eat the right kinds of foods. A bagel and a can of fruit juice doesn't take any longer to eat than a soft drink and chips.

Workers who skip meals throughout the day tend to overeat when they finally do sit down to eat. In some cases, small planned snacks throughout the work day allow the body to process small amounts of calories. The steady supply of energy keeps blood sugar in the normal range.

Encourage a healthy diet

Hess consults with companies on nutritional issues and suggests several steps supervisors can take to encourage healthy eating habits in themselves and in their employees:

- Provide adequate time for breaks and meals. Encourage your employees to leave their desks for lunch.
- Suggest having a small refrigerator and a microwave oven on the premises so that employees can bring food from home and prepare their lunch.
- Suggest that the vending machines be stocked with nutritious snack foods, juices, fruits and pre-wrapped sandwiches rather than candy bars and chips. This may be especially important if your company does not have a cafeteria and your employees depend

on the vending machines as a main source of food during the day.

- If employees bring in snack food for others, suggest that they bring foods such as dry roasted nuts, dried and fresh fruit or sunflower seeds rather than cookies or candy.
- If you conduct morning meetings with your employees, provide them with healthy breakfast snacks, such as yogurt, whole grain muffins, bagels, juices and fresh fruit instead of the traditional donuts and sweet rolls.
- If you have a company dietician, ask him or her to make a departmental presentation to promote healthier eating habits.
- If your company has a fitness center, encourage employees to use it on a regular basis.

A nutritious shopping list

Think about what you are going to buy (not what you're eliminating from your diet). Buy tasty, nutritious foods instead of the less healthy ones.

Choose foods that are fresh or dried and not processed. Many of the foods listed below require no preparation. They are convenient to buy and bring to work.

Fresh fruits
Apples
Bananas
Nectarines
Peaches
Pears
Plums

Dried fruits (a candy substitute)
Apples
Apricots
Banana chips
Papaya, pineapple (usually found in health food stores)
Pears, peaches
Prunes
Raisins

Whole grains
Bran muffins with or without fruit
Whole grain bread

Fresh vegetables
Carrot sticks
Celery sticks
Chunks of broccoli, cauliflower, and green pepper
Lettuce (add to a sandwich)
Plum tomatoes

Juices
Apple
Grape
Orange
V-8

Nuts
Almonds
Unsalted cashews
Unsalted peanuts
Walnuts

Candy
Many nutritious candies (made with honey and other natural ingredients) are found in health food stores.
Carob bars (carob has a taste similar to chocolate)
Fruit and nut bars
Sesame honey candy (crunchy, bite size, and individually wrapped)

Fresh vegetables can be prepared while fixing dinner or over the weekend. Place in individual baggies in the refrigerator. Each day take out a portion.

Remember: eating healthy food is less expensive than a doctor's visit and prescription (aside from the illnesses' potential damage to your body). A thought: a body cannot store fat if it isn't fed fat. If you eat foods rich in vitamins and minerals, your body and mind will reap the benefits.

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Holmes Safety Association
Monthly safety topic

Fatal roof fall accident

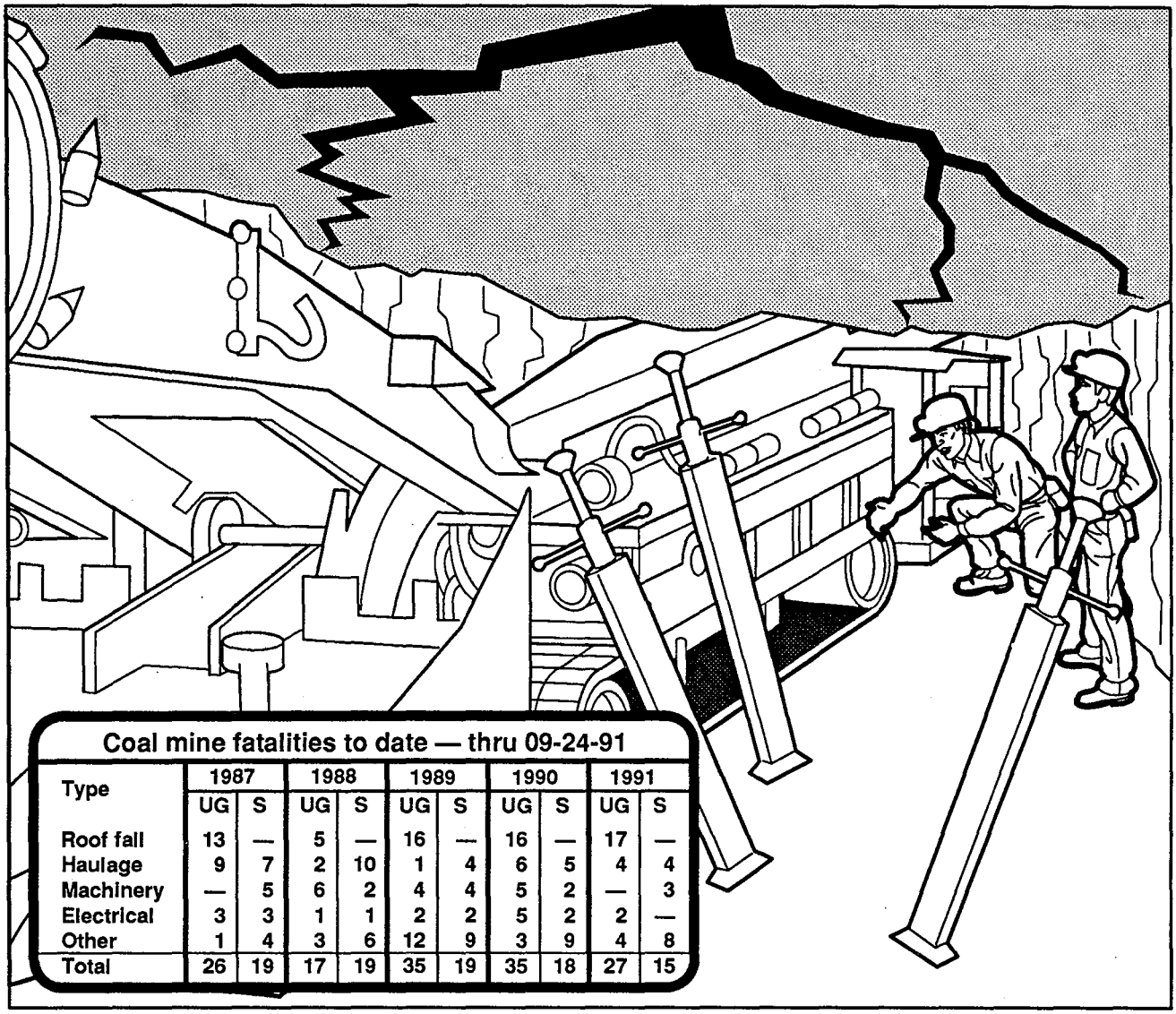
GENERAL INFORMATION: A 49-year-old roof bolter operator, with 26 years of mining experience, was fatally injured by a roof fall while installing breaker posts at the entrance to the No. 4 pillar. The single-section mine is operated by two production shifts with a total of 22 employees, producing 1,200 tons of coal daily. The average coal height is 56 inches, and coal is mined by using a Joy remote-controlled continuous miner, two Simmons/Rand haulers, and one dual-head Fletcher roof-bolting machine. Coal is transported from the section, which is approximately 5,600 feet deep, to the surface via belt conveyor.

DESCRIPTION OF ACCIDENT: The day-shift crew began operations at the usual starting time of 7:00 a.m. and traveled to the 002 retreat-mining section via three battery-powered, rubber-tired mantrips. They arrived on the section at approximately 7:20 a.m. and met the section foreman who had gone underground earlier to conduct a preshift examination. Instructions were given to the crew by the section foreman to cut the No. 6 pillar located in the right butt-off of the 5th Left Panel. Two sumps were taken out of the No. 6 pillar, and the crew advanced to the 5th Left Panel to begin pillar extraction on the top end row of pillars.

The miner operator trammed the continuous miner up the No. 5 entry and began cutting the right side of the No. 4 pillar, loading coal into two 820 S/R Un-A-Haulers. The victim cut three sumps out of the right side of the pillar and backed the miner outby for approximately 50 feet, so the required breaker posts could be installed in preparation to cut the left side of the No. 5 pillar. The section foreman, electrician, two laborers, and the victim began installing breaker posts at the edge of the No. 4 pillar which had just been cut.

At 9:25 a.m., as the victim was installing the last breaker post, a fall occurred in the No. 4 pillar which tailed out to the edge of the 42-inch conventional roof bolts, striking and crushing the victim and causing minor injuries to one of the two laborers. The rock measured approximately 30 feet long, 23 feet wide, and 26 inches thick. The section foreman and the other laborer removed a piece of rock, measuring 42 inches long, 21 inches wide, and 11 inches thick, which had covered the victim. The victim was placed on a stretcher and transported to the surface via a battery-powered mantrip operated by the electrician and accompanied by the miner operator.

A certified emergency medical technician, stationed on the surface, was



Coal mine fatalities to date — thru 09-24-91

Type	1987		1988		1989		1990		1991	
	UG	S	UG	S	UG	S	UG	S	UG	S
Roof fall	13	—	5	—	16	—	16	—	17	—
Haulage	9	7	2	10	1	4	6	5	4	4
Machinery	—	5	6	2	4	4	5	2	—	3
Electrical	3	3	1	1	2	2	5	2	2	—
Other	1	4	3	6	12	9	3	9	4	8
Total	26	19	17	19	35	19	35	18	27	15

contacted and responded by entering the mine. He met the mantrip approximately 2,500 feet underground and started CPR immediately on the victim. The victim did not respond. The mantrip continued to the surface, arriving at approximately 9:50 a.m. The deputy coroner was called to the mine site where he examined the victim and pronounced him dead at 10:50 a.m. The ambulance service transported the victim to the funeral home.

CONCLUSION: The cut taken out of the right side of the No. 4 pillar measured approximately 23 feet wide and 30 feet deep. The approved plan stated that no cut will be more than 20 feet deep and 20 feet wide. The victim, whose regular job was a roof-bolter operator, was installing breaker posts at the time of the accident.

The fatality occurred due to the failure to comply with the approved roof control plan for the extraction of coal pillars. The reduced pillar-block size, excessive cut depth and width, and the presence of laminated shale roof were all contributing factors in the accident.

Getting work off employees' backs

If back injuries are your problem, ergonomics could be your solution. Here's expert advice on analyzing jobs and implementing solutions.

By Gregg LaBar

Ergonomics consultant Clifford M. Gross, Ph.D., doesn't accept the notion that back injuries just happen; that they can't be anticipated and then prevented.

"A lot of people think of back injuries like the flu: Unfortunately, some people get the flu, we don't know why, but we try to help them get better, and tell them to come back to work when they're ready. That's the way back injuries are viewed—they come in under the door and leave equally mysteriously," said Gross, president and CEO, Biomechanics Corp. of America, a Melville, New York-based ergonomic product and service company.

But Gross believes most back injuries can be traced to jobs and work tasks. Experts say worker groups most affected include professional drivers, patient handlers, manual materials handlers, maintenance workers, assembly line personnel, and office workers. These jobs, cutting across a variety of business sectors, generally require a lot of lifting, lowering, pushing, pulling, carrying, twisting, awkward positioning, or standing or sitting in a static position—all risk factors for back injuries. The frequency of the activity and the positioning of the work are also factors.

Back injuries are seldom the result of a single traumatic event such as an extremely heavy lift or a sudden twist. In fact, according to ergonomics consultant Suzanne H. Rodgers, Ph.D., of Rochester, New York, all but about 4 percent of back injury cases result from repetitive overexertion of the disk and spine.

"Usually, there is a combination of factors," Rodgers said. "It's not just lifting a heavy object that causes a problem. The biggest problem is having to work in an awkward posture that may involve bending and then following that with picking up a 40-pound item many times a day. What you have is a fatigued back trying to do the work. There's a sustained effort without time for recovery."

"You have to be fairly relentless to produce these injuries," Biomechanics' Gross added. "It's the insidious repetitive stressors that gradually damage the structure [of the spine and disk]. These are the kind of forces you may be able to tolerate 100,000 times but not 200,000 times."

Indeed, if injury statistics are any indication, there are many such jobs in industry today. Back injuries occur more frequently than any other work-related injury. There were 380,000 such injuries in 1989 in the United States, according to National Safety Council statistics. Other sources estimate that 80 percent of Americans will suffer a back injury during their adult years. Ninety

percent of those people will have at least one recurrence. The annual cost of work-related back injuries runs in the billions of dollars.

What you can do

"Back injuries are the single largest cause of nonfatal injury in the world," Gross said. "Preventing the first time occurrence is really the only successful treatment."

Training workers in proper lifting techniques is one possible way to prevent back injuries, but it is far from enough, according to most experts. For one thing, lifting is only one of many risk factors for back injuries. In addition, training may not have the permanence needed.

"Training does have an effect," Rodgers said. "Perhaps if you repeat it every 6 months, you might be able to keep the number of back injuries down. But what you're saying when you rely on education is that the problem is the person. In a lot of cases, you're looking at sick jobs, not sick people."

Gross also sees value in good worker training, but agrees that teaching workers to lift properly is not the sole answer. That's "like telling people not to listen in a noisy work environment. If it's 70 decibels, no problem. If it's 110 decibels, you have a problem. It's the same for the spine. If the loads are fairly light and you can use discretion on when and how you lift, training is fine. But, if you have to apply repetitive heavy forces to the spine, it's a problem. Then it probably won't matter what technique you use."

Gross espouses ergonomics — analyzing the workplace, job, and job tasks and, if necessary, changing them to make sure they fit the worker — as the best way to prevent back injuries. Some ergonomic solutions — a classic example of engineering controls — can be complex and costly (redesigning part of an assembly line, for example), while others can be simple and cheap (putting longer handles on brooms, dustpans, and shovels to eliminate bending, for example).

"You can solve most of these problems several different ways," Rodgers said. "You choose the most inexpensive solution that's going to give you the best improvement."

Having a program

Christopher J. Cox, safety director, John Deere Davenport Works, Davenport, Iowa, is one safety professional who's convinced that ergonomics is the best way to deal with most back injury problems. "I can change the environment easier than I can the worker," he said.

That's not to say ergonomics is easy, however. It requires at least a basic knowledge of biomechanics, engineering, and human dynamics. Companies that develop ergonomics programs have to provide for the training of supervisors, managers, and employees, as well as develop a system for prioritizing, analyzing, and changing jobs.

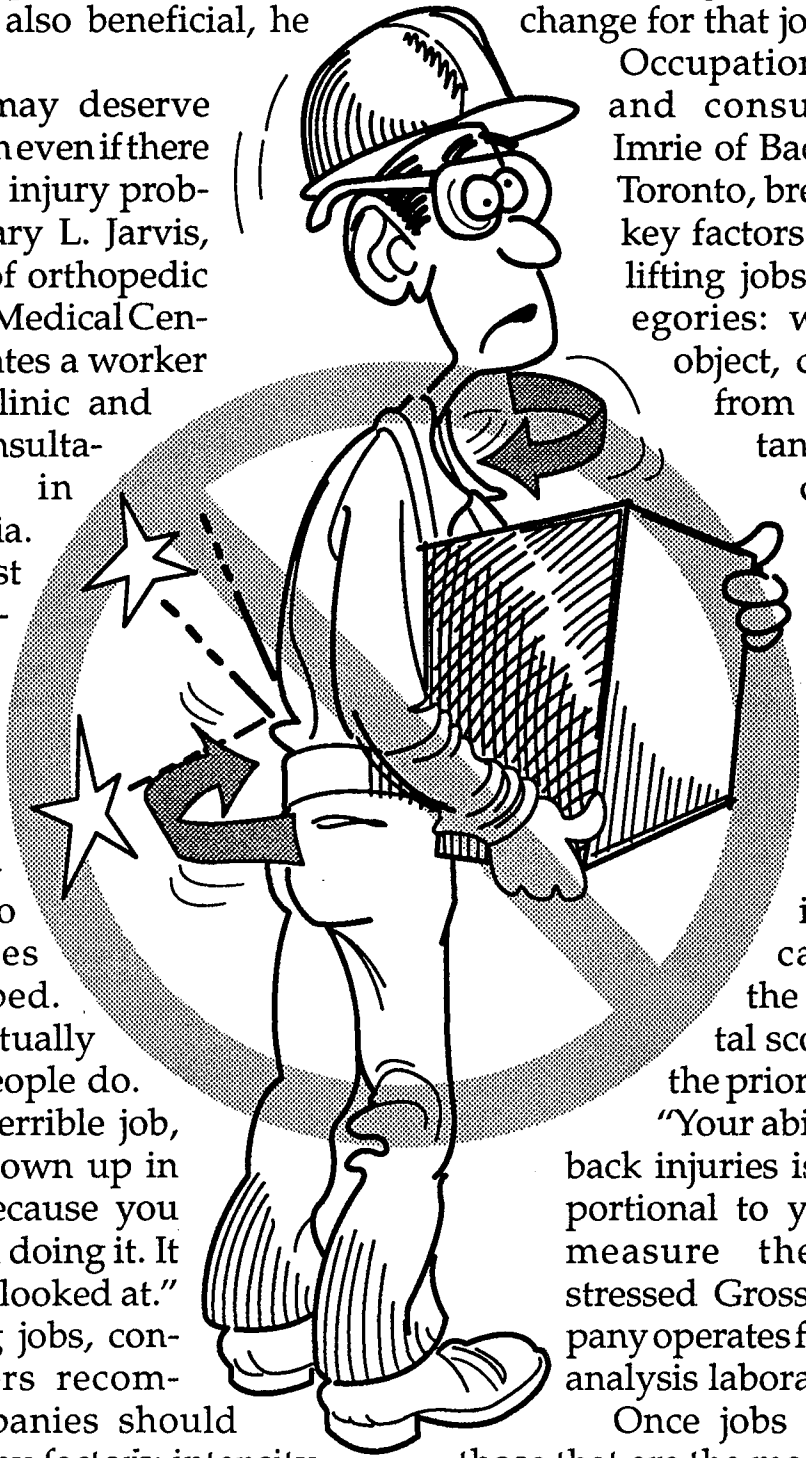
Prioritization of jobs to be reviewed can be done in several ways. At the Davenport Works, where John Deere manufactures large industrial equipment, Cox said he prefers the proactive way of examining those job tasks that have the potential to cause back injuries. He added that it's important to

respond to employee requests for analysis whether or not the job has been linked to back injuries. Traditional use of workers' compensation and OSHA 200 log data is also beneficial, he said.

Some jobs may deserve prompt attention even if there are no apparent injury problems, added Gary L. Jarvis, vice president of orthopedic services, Irvine Medical Center, which operates a worker rehabilitation clinic and offers other consultative services in Irvine, California.

"You can't just focus on symptoms," Jarvis said. "Even job descriptions, if the company has any, aren't that helpful because people do stuff besides what's described. You have to actually look at what people do. Perhaps it's a terrible job, but it hasn't shown up in the statistics because you have Superman doing it. It still needs to be looked at."

In analyzing jobs, consultant Rodgers recommended, companies should consider four key factors: intensity of effort; how often the muscle group gets a rest; how many times the activity is done per minute; and how much work is done during a shift. Rodgers uses a system that rates each factor on a numerical scale, and the numbers are added together. The higher the total score, the higher the priority for change for that job.



Occupational physician and consultant David Imrie of Back Power Inc., Toronto, breaks down the key factors for analyzing lifting jobs into five categories: weight of the object, distance away from the body, distance moved, frequency, and coupling (such as lifting in combination with twisting). Imrie's Back Power Program assigns numerical ratings for each category, and the higher the total score, the higher the priority for change.

"Your ability to prevent back injuries is directly proportional to your ability to measure the problem," stressed Gross, whose company operates four ergonomic analysis laboratories.

Once jobs are analyzed, those that are the most problematic and affect the most people should be considered for change first, our respondents said. Ergonomic changes can take the form of redesigning a workstation

or tool, shifting the workload among workers in an area, automating certain processes, changing the weight or size of objects, using carts and forklifts instead of moving things by hand, and improving the gripping surface of things that have to be moved. Seldom do ergonomic solutions require full-scale revamping of an assembly line or procedures, Rodgers said.

"You can't expect to always be able to recommend major changes because if companies can't or won't do them, they won't do anything," Rodgers said. "You have to look at what can be done immediately and over the long term."

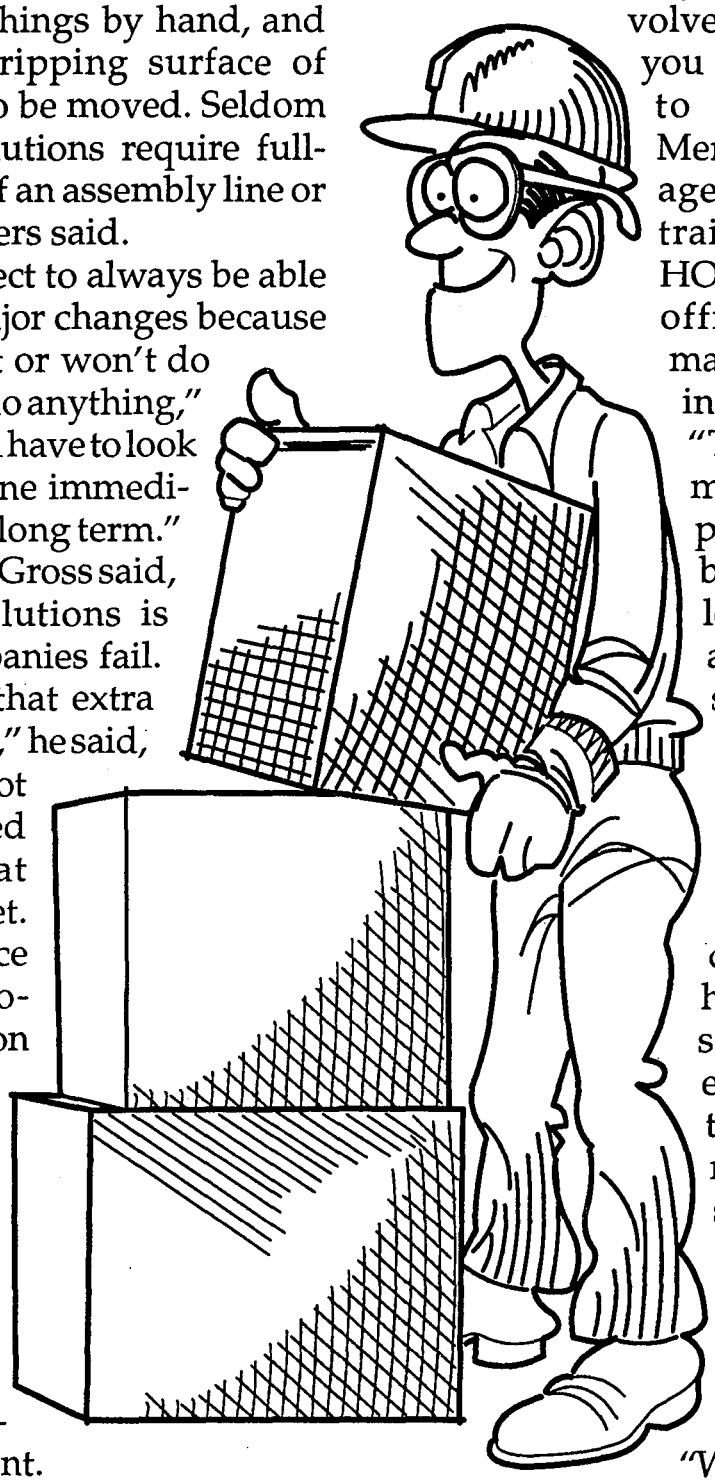
Unfortunately, Gross said, implementing solutions is where most companies fail. "If you don't go that extra mile and fix the job," he said, "you've wasted a lot of time and created expectations that will never be met. That's the difference between an ergonomics information program and an ergonomics injury prevention program."

One other common reason for failure is not allowing and encouraging employee involvement.

"Having an employee-driven program is really important," Cox said. "We want employees to come forward with their problems.

When looking at a job, we first ask the operator about the job and what problems he's had."

"If you don't get the worker involved, no matter what you do, it isn't going to work," added Merle Barnes, manager of safety and training programs, HON Industries, an office furniture manufacturer based in Muscatine, Iowa. "The key in my mind is teaching people a little about body mechanics, letting them look at their own workstations, and giving them a say in changes."



Examples

One HON Industries facility has an off-line assembly line where employees are able to try new equipment and tools to see if they're more effective and make for a more comfortable work environment.

"Workers are fantastic at finding solutions," Rodgers contended. "An engineer might tend to think of automation as the only way to solve these problems, and that can be

expensive. Workers don't really care how it gets done. Their ideas are more likely to identify root causes and simple solutions."

"You have to understand each problem as a unique solution," Rodgers said. "It's not just a matter of throwing furniture at things. If you do that, you might end up with expensive equipment with features you can't use or aren't beneficial, such as an adjustable height table which you have to crawl under and push up with your shoulders to adjust." Instead of an adjustable table, for example, what you might really need are adjustable chairs or a simple platform.

"I think the fear that most people have about ergonomics is that it's expensive," said Ray Bergman, personnel supervisor at Modine Mfg. Co.'s McHenry, Illinois, plant. "I don't buy that. Some of these things are very simple solutions."

According to Bergman, back injuries used to be a big problem at Modine's McHenry plant, a 30-year-old facility which employs some 180 hourly workers in the manufacture of air conditioning condensers for cars and trucks. However, in the last 3 years, the company has instituted more than 60 ergonomic improvements—many aimed at preventing back injuries.

For example, the company redesigned the part of its assembly line where condenser cores had to be lifted several times as they were covered with anti-corrosion protection, water-tested to check for leaks, and then sent to the painting area. Now, they're hung up once on a continuous line that moves them through the various procedures. This has eliminated some 600 lifts a day for workers in that area.

In addition, the company has installed box tilters to assist in packaging the final product for shipment and uses scissor lifts to stack boxes holding condenser cores. Ergonomics has even carried over to the lunchroom, where Modine has replaced its old chairs with ergonomically correct chairs.

HON Industries, Barnes reported, uses scissor lifts to help in the packaging of two-, three-, four-, and five-drawer file cabinets. Depending on the size of the cabinets, the box or the worker is put on the lift to keep the work height at an appropriate level. In addition, small-assembly workstations have been altered to eliminate a lot of the twisting and bending that workers had to do when lifting parts off a pallet. Now, the pallet is placed on a table, which is easily accessible and at the right height.

The company continues to target its program at assemblers—the bulk of its workforce. For example, several jobs have been found to require excessive reaching because the size of the product does not allow the worker to get as close to his work as necessary. That's a difficult problem, but Barnes is hopeful there will be some improvements.

John Deere solutions

At the John Deere plant, Cox reports, workers use a seesaw-type device to make it easier to tighten bolts on the bottom of industrial vehicles. Pushing down on the one end of the device raises the other end, allowing the worker to put the bolts in without having to crawl underneath the vehicle

and lay on his back. In addition, John Deere puts extensions on tools to eliminate some of the reaching that workers might otherwise have to do.

Some ergonomic improvements have been made without adding or changing equipment, Cox said. For example, the heaviest tools and parts are placed in the middle of holding racks (waist level), where they're easier to pick up, not at the bottom, where people might normally think to put them. Another easy measure is to wipe off tools and equipment that may be greasy or oily because that reduces the amount of force needed to lift or use such things.

Cox said something as simple as hanging air hoses, instead of laying them on the floor, is an ergonomic improvement. Otherwise, workers have to pick up hoses by bending down and slinging them over their shoulder.

While many ergonomic improvements can be made without altering the company's business, Irvine Medical Center's Jarvis is aware of at least one company considering redesign of a product as a way to reduce back injuries. Jarvis has been working with a distilled water supplier on redesigning its 37-pound, 5 gallon water dispensers commonly found in offices. As currently manufactured, the jugs are round, bulky, and have no handles. The company is currently doing a pilot project on the prospects for manufacturing 2-1/2 gallon jugs with handles.

Making a difference

Modine's McHenry, Illinois, plant averaged some 50 lost-time injuries per year through the mid-1980s; many of those were back injuries. An aggressive approach to ergonomics was initiated 4 years ago, and Bergman is convinced that it has played a major role in the company's improved safety record. In 1990, for example, the company had only two lost-time injuries, neither involving backs. In fact, only two back injuries have been recorded at the facility in the last 4 years, revealed Bergman.

Bergman's secret to ergonomic success: He's tied many of the ergonomic changes to productivity and quality. Consequently, they've been paid for out of the production budget, not the safety budget, and supported by top management. "We've been able to show more than a safety benefit with most of these changes," Bergman said. "I don't think we had to, but it helps."

At HON Industries' 22 manufacturing facilities, back injuries, while still a serious problem, have been cut by about 50 percent in recent years.

Meanwhile, John Deere's Cox said he can't yet quantify what effect the recent emphasis on preventing back injuries has had, but he's confident that, even in lieu of these numbers, ergonomics can prove its value.

"If you're too worried about numbers, you could tie up all your resources just trying to get them," Cox said. "To me, ergonomics is caring about your employees. It's good business, and that's all you have to say. If something looks uncomfortable or hard, it probably is. I think you have a moral responsibility to try to correct it."

Use whole-brain learning methods to control repetitive motion injuries

Self-discovery learning helps workers take responsibility for their activities at home and work

By Lynne M. Davis, Physical Therapist, Workplace Lifestyles, Minneapolis, Minnesota.

Repetitive motion injuries cost industry thousands of dollars annually in worker's compensation. Carpal tunnel syndrome, tenosynovitis, trigger finger, tennis elbow, and shoulder tendinitis are just a few of the cumulative trauma disorders that account for more than 16 million workdays lost each year by employees of U.S. corporations. The resultant pain and suffering, functional limitations, and long-term disability continue to burden business and industry severely. According to the Kemper National Insurance Companies, just one case of carpal tunnel syndrome requiring surgery can cost up to $30,000.

It is thus imperative that workers involved in assembly work and other repetitive tasks be taught the correct way to perform tasks, so that their risks of incurring repetitive motion injuries will be minimal. This is also true of those whose tasks or recreational activities lend themselves to stressful positions during work or relaxation. Glenda Key, an industrial consultant and president of Key Functional Assessments Inc., in Minneapolis, Minnesota, suggests that the most effective use of a company's training budget is participant-centered learning.

"Whether you spend $300 or $30,000 on education for repetitive motion injury prevention," said Key, "your investment will go much farther if you involve all your employees."

Self discovery

Robert Pike, president of the training and development firm Resources for Organizations Inc., in Eden Prairie, Minnesota, agrees with Key. "People learn best through the experience of self-discovery," he said. "We must excite and direct the self-activity of learning. We live in an age of entertainment. Thirty years ago we watched one black and white television for 6 hours. Today, we flip through 68 channels of cable and say 'nothing is on.' For the adult learner, this means [we need to help him in] capturing his own sense of participation and energy."

Key's approach to the prevention of repetitive motion injures is "whole-brain" learning and rewards for participant involvement. "It is one thing," said Key, "to tell a worker to keep his wrist straight when using a screw driver. It is quite another thing to have the worker demonstrate the commonly used, improper way to hold the tool, then work together toward a solution. We have found that only through whole-brain learning can the employee really internalize the correct position."

Begin with managers

The first step toward doing this in-

volves leading plant and production managers, human resource personnel, engineers and supervisors through a structured, participatory analysis of the problem. This should encompass the full scope of the problem and provide options for intervention. Engineering changes alone are not enough for a solution, nor is training only the labor force.

Job-task analysis includes identifying worker postures and movements, tool use and design, materials handling, work-station design, repetitiveness, and weight or force requirements. This information is used later during employee participation sessions. "Management commitment is first," said M. Steinwell, president of Steinwell Inc., in Fridley, Minnesota. "Then training production employees is essential."

The hands-on learning of a participation session enables management to discover the insight that workers might have on a production process. Key said that employees who are involved take more responsibility for their part in the solution. "They identify simple changes they can make immediately. More importantly, they see immediate results. It becomes a powerful incentive for employee involvement."

Employees often do not realize that their home and social habits may contribute to their injuries. Learning by doing is an excellent way to help workers take responsibility for their activities at home and work.

Suggestions

In educating both management and labor, make prevention programs effective by following these suggestions:

- Use whole-brain learning. Exercise all the senses possible —sight, sound, smell, touch, and taste. Appeal to all learning styles by including lecture, demonstration, and hands-on learning throughout education sessions.
- Use the same terms throughout the education sessions for both employees and managers to ensure precise, objective communication for follow-through. Make sure everyone is speaking the same language.
- Listen to your employees. Even a periodic 10-minute safety meeting focusing on one point can foster effective communication.
- Develop follow-up procedures for supervisors. Include safety meeting discussion topics, employee observation checklists, and regular communication with staff nurses and safety personnel.
- Make sure that supervisors set a safety example for production employees. A supervisor's attitude toward safety determines the safety attitude of employees who report to him.

At one point, each employee diagnosed with carpal tunnel syndrome participated in a 90-minute session of hands-on learning. This addressed hand, arm and upper-body postures and positions, using work and home examples. The purpose was to allow the worker to identify problems that caused symptoms, and to implement modifications to decrease them.

A follow-up questionnaire was administered to participants, asking three questions: Were you able to reduce your symptoms? Were you able to make changes at work that reduced your symptoms? Were you able to make

changes at home that reduced your symptoms? The results indicated that 97 percent of participants reduced symptoms; 83 percent were able to make changes at work that reduced their symptoms; and 73 percent were able to make changes at home that reduced symptoms.

Injury statistics

Last months statistics show eye injuries were predominant over all other injuries.

Boys might not make passes at girls who wear glasses, but on the job, wearing safety spectacles can prevent serious injuries to your eyes.

People who wear glasses usually become so accustomed to them they seldom notice they have them on. Without much thought they clean them, carry them in a case, and keep their prescription up to date.

Unfortunately, people who don't wear glasses have never developed these habits, and when it comes to eye protection, too often they forget it. Some safety glasses and goggles grow dusty hanging in lockers as their owners trust blind luck to protect them from injury.

As a result, some 130,000 disabling (lost time) eye injuries occur each year, 6 *percent* of all work related injuries. Eye injuries can occur in any work area, including offices.

Eyesight is often taken for granted. We treat our eyes as though we can easily find replacements, and this is why so many people lose or injure their eyesight each year.

The eye protection habit: Most common among complaints about eye protection is that it's uncomfortable. That is why glasses, face shields and goggles need to be correctly fitted. Frames must be tight, straight, and properly adjusted.

Dirt, grease, and scratches can interfere with vision and make wearing eye protection uncomfortable. Careful handling, cleaning, and storage in the individual's work area or tool box will encourage use.

During hot weather, a sweatband may help keep perspiration off goggles and make wearing them more comfortable.

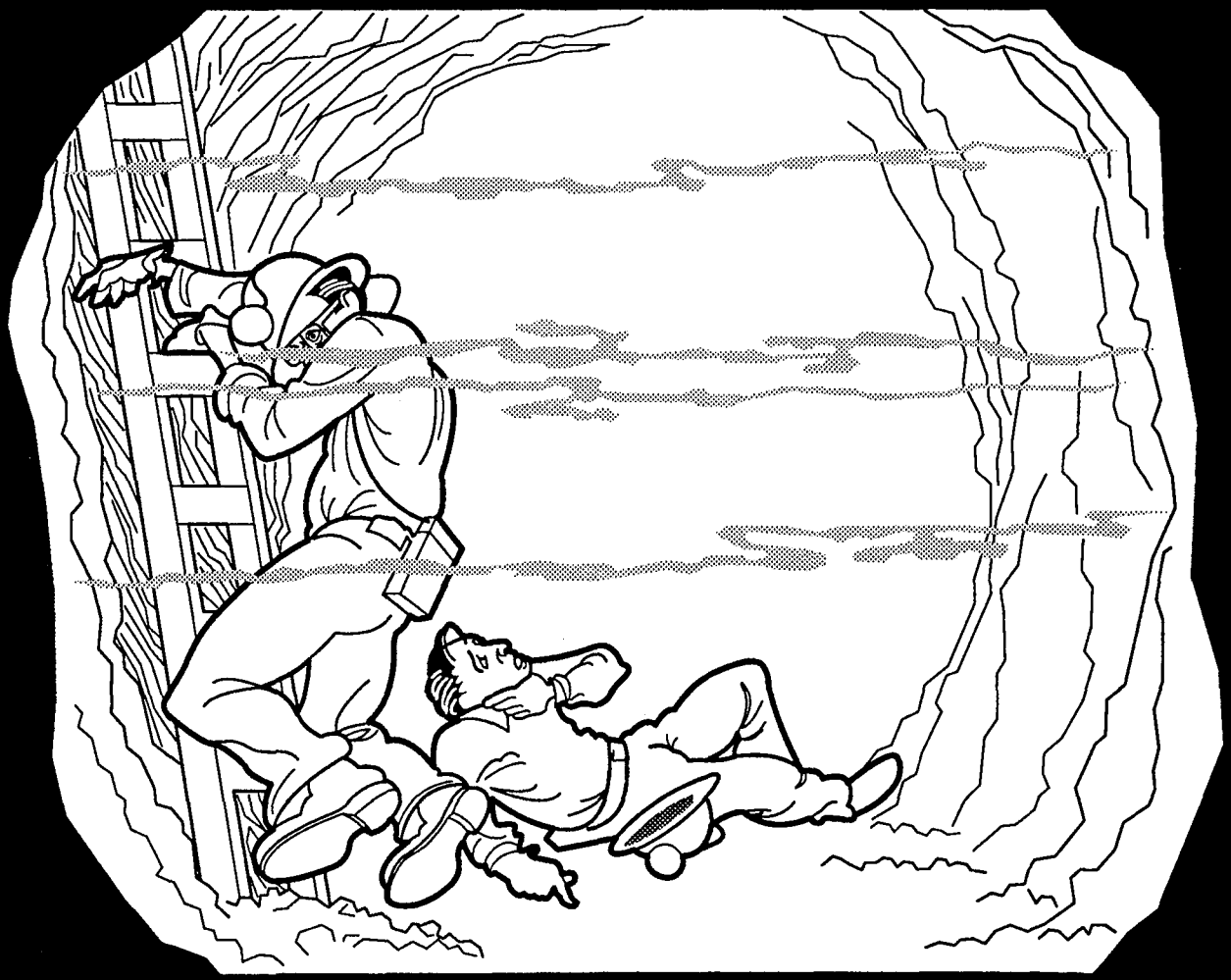
Lens "fog" can be reduced by using antifog sprays and cleaning tissues.

Most eye injuries are preventable. Please take time to keep your eyes, and the eyes of those under your supervision, safe from hazards. This is a habit which will help reduce lost time from eye injuries at work, as well as off the job.

Stressing the importance of eye protection, the Safe Worker magazine points out that you can chew with false teeth, walk with an artificial leg, hear with a hearing aid, but there's no way that you can see with an artificial eye.

EYE INJURIES = $ $ $ $ $

Confined spaces are dangerous places



Know your escape route!

Courtesy of Mines Accident Prevention Association
Ontario, Canada

Prescription for improved safety performance

How do you label the people you work with? Do you think of them as employees, pawns, associates, rivals, friends, or foes? Human resources or profit drainers? Providers of satisfaction or frustration?

Certainly, what you expect from your co-workers is going to affect the way you treat them. The problem is, how you treat them also affects how they behave. Persist in treating people as if you expect them to perform poorly, and they will probably fulfill your expectations.

You need only review some recent fatal accident reports to discover that too many workers are still making unsafe on-the-job choices, and paying a horrible price for their mistakes. You may be able to influence people to make better choices by changing the way you treat them. To improve the safety performance of your co-workers, consider the following five "treatment options:"

1. Respect
2. Empower
3. Reward
4. Rehabilitate
5. Remove

1. Respect: Several months ago, I asked a quarry foreman if he had any suggestions for improving his company's safety program. He responded by saying that he wanted the hourly employees to become more involved in the program, perhaps by conducting some of the safety training. But more important than his words were the look of concern in his eyes and the tone of sincerity in his voice. His co-workers could sense their foreman's concern as well. To them, it meant that they had value not just for their labor, but for themselves, because their boss respected them.

Like the quarry foreman, successful managers lead by example. Their actions match their words where safety is concerned. Rules are fair and apply to all employees, both hourly and salaried.

Because employees feel respected, an atmosphere of trust prevails between labor and management. Communication naturally improves between people who trust each other, which helps the entire work force to make better choices.

2. Empower: "Empowerment" has become a buzz-word to describe everything from parents controlling schools to patients managing their own medical treatments. In today's mining environment, workers must be empowered in order to get anything done. When stockpiles are undercut and become unstable; when material gets hung-up in crushers; when brakes go bad on trucks—are supervisors the only people who can recognize and correct the problems?

If the workers at the scene are trained—and expected—to solve these continuing problems, then obviously it makes more sense for them to do so than to always consult with supervisors. Management's role is to design a system in which these decisions are made correctly by the appropriate people. Here is how to design an effec-

tive system:

A. Identify the jobs that are most important for achieving safe production and conduct a Job Safety Analysis (JSA) on each of these jobs.

B. From the JSAs, determine the critical decisions

that need to be made with each job step.

C. Establish who should make these decisions.

D. Establish what information is needed to guide the decisions.

E. Design training to deliver the information.

Since the people performing the jobs are usually in the best position to make critical decisions, empowerment can be seen as a technique for providing effective task training. Workers may assist in each phase of the design process, and in many cases may also serve as trainers assigned to deliver the decision-making information to co-workers.

Whether or not managers are comfortable with employees making decisions, the fact is that employees are already making them. Collectively, the decisions of front-line workers—people like mobile equipment operators and maintenance mechanics—may have a greater direct impact on an operation's performance than the decisions of management. Rather than bemoaning its loss of control over decision-making, management should concentrate on providing employees with all the information they need to make good decisions.

3. Reward: People who are empowered with decision-making responsibilities must also be held accountable for their decisions. An axiom of good business practice is that what gets measured and rewarded gets done. Consequently, decisions that support safety should be measured and rewarded.

Many safety incentives programs reward work groups and individuals for results, such as days without a lost time injury, while paying little attention to how the safety records are achieved. This sometimes leads to injuries going unreported or being covered up, which may in turn lead to a more dangerous work place, since the causes of hidden accidents are unlikely to be identified.

A better approach for achieving long-term success is to measure and reward the activities that reflect safe decisions. Examples include: conducting and participating in safety meetings; developing JSAs; using personal protective equipment; and following established, safe job procedures. Positive results are bound to occur where these activities are part of the daily routine.

Procedures for measuring and rewarding these activities can be integrated into your company's performance appraisal system. As the saying goes, money talks, and people usually understand the message. But, if you feel respected by your co-workers and empowered to do your job as well as it can be done, you may find that the work itself feels like a reward. Most people want to do a good job, and just being free to do it can be a powerful motivator. If you find that hard to believe, just think of Nolan Ryan for a minute. Do you suppose, at the age of 44, that money is the only thing that

keeps him pitching? No; I suspect that Mr. Ryan is as amazed by his continued success as the rest of us, and he will keep right on taking the mound as long as he can still throw strikes.

For work itself to feel rewarding, honesty must exist along with respect and empowerment. Another of those old business axioms is that profit is truth. Managers who share information freely when times are good, but clam up for "morale's sake" when business takes a downturn, risk nullifying a lot of hard-earned trust. People need to know where they stand. Moreover, employees who participate in difficult decisions often suggest creative alternatives.

For example, several years ago, employees at an iron mine were told that 40 people had to be laid off. Rather than follow standard seniority procedures, employees suggested that management should ask if there were any people who wanted to be laid off. Surprisingly, when the suggestion was followed, there were more than enough volunteers from people who, for one reason or another, had a desire for some time away from the job. In fact, a few people were disappointed that they had to keep working. Thus, both work itself and time away from work can be perceived as effective rewards, depending on the circumstances and needs of the workers.

4. Rehabilitate: While times are not always great at work, neither are they always terrific away from the job. Personal problems can, and do, interfere with an employee's ability to make safe decisions. Perhaps the most dangerous problem workers are susceptible to is chemical dependency.

Whether they are using booze, cocaine, speed, or any other mood-altering substance, employees addicted to alcohol or drugs do not have their minds on their jobs, but on how they can obtain more of the drug. Getting high is the most important priority in their lives. They never planned to get that way, and may wish they had never heard of the drug that has them hooked. But in a society that promotes drinking to feel good and pill popping to relieve pain, a certain amount of addiction is inevitable.

Alcoholism and other addictions are recognized as diseases by the American Medical Association, but what makes them especially difficult to treat is that addicts hardly ever admit they have a problem, or ask to get help. More often, they have to be dragged, kicking and screaming, into treatment. Deep down, they may know they need help, but they feel so much guilt for being "out of control" that they have lost respect for themselves, feeling unworthy of help. Many sink into despair; some kill themselves. Indeed, if an addict fails to seek recovery, the only things left to look forward to are insanity and death.

But addicts can be rehabilitated. Even though chemically dependent people lose respect for themselves, management need not lose respect for them. Through the help of an Employee Assistance Program (EAP) and trained professionals, addicts can be offered the chance to get treatment, and into a recovery program. Many addicts in recovery turn out to be more productive and energetic than other employ-

ees when they return to work.

5. Remove: Addicts must be offered a clear, firm choice: treatment and recovery, or termination. While this may seem harsh, giving workers an opportunity to choose is to both respect and empower them. As long as chemically dependent employees continue to drink alcohol or use other drugs, they cannot be relied upon to make safe on-the-job decisions. Getting them to face that fact is an act of respect. Giving them the freedom to choose between their drug or their job empowers them. Sadly, sometimes people make a choice that may not be in their best interests. But, whatever choice they make, the safety of their workplace will be improved as a result of that choice.

Reprinted from the June 1991 issue of ***Cal Quarryman's Safety Newsletter****, Duluth, MN.*

Use an ounce of prevention

Keep asking "what if?"

By H. L. Boling

An ounce of prevention is worth a pound of cure.

It becomes painfully apparent upon investigation of almost every accident that there was a simple procedure already established that, if followed, could have prevented it. Or, could have prevented or stopped the chain reaction short of its tragic climax.

Of course, it's far easier looking back than looking ahead, but it's up to every one of us to always look ahead, to think ahead, and to continue to question each job and situation...

"What if?"

If only we'd thought to snuff out that spark . . . tighten that loose bolt . . . shore up the trench . . . secure the ladder properly . . . inspect the cable . . . remind our coworkers to wear safety equipment.

If we had done that *before,* it would have been quick and easy to correct. **After,** it's beyond our reach and power to prevent or avoid.

So, let's reflect on the above and continue to question..."What if?" and practice safe production methods.

BEFORE, it's rubbing out a single spark; **AFTER,** it's a raging fire consuming work areas and human lives.

BEFORE, it's tightening a loose bolt and avoiding a malfunction; **AFTER,** it's fingers or a hand severely mashed or worse.

BEFORE, it's being responsible enough to safely guide backing equipment; **AFTER,** it's an unsuspecting person trapped by backing equipment and never returning home.

BEFORE, it's shoring and supporting a questionable trench; **AFTER,** it's the whole world caving in on someone, forever.

BEFORE, it's taking a defective ladder out of service; **AFTER,** it's a sickening crack and a permanent disability.

BEFORE, it's barricading and flagging a floor opening; **AFTER,** it's a scream and a downward flight to injury.

BEFORE, we all have the power to act, to prevent or avoid those tragic accidents; **AFTER,** there is no power on earth that can do anything to change or reverse the circumstances.

Little things are sometimes hard to see, but are seldom completely invisible; however, they can still be found with a little double checking followed by that ever-so-important question . . . "What if?"

We should all strive to develop the **BEFORE** attitude as we practice safe production.

Morenci Copper Review, August 1990

Holmes Safety Association
Monthly safety topic

Fatal electrical accident

GENERAL INFORMATION: A 32-year-old welder was fatally injured when he was electrocuted while contacting the energized metal casing of a short-circuited, electrically-powered, hand-held impact wrench. He had a total of 17 months mining experience—all at this mine.

The mine produced crushed stone from deposits of rhyolite and novaculite. The rock was drilled, blasted, and transported by haul truck to a dump hopper. The material was then crushed, screened, washed, and stockpiled for shipment.

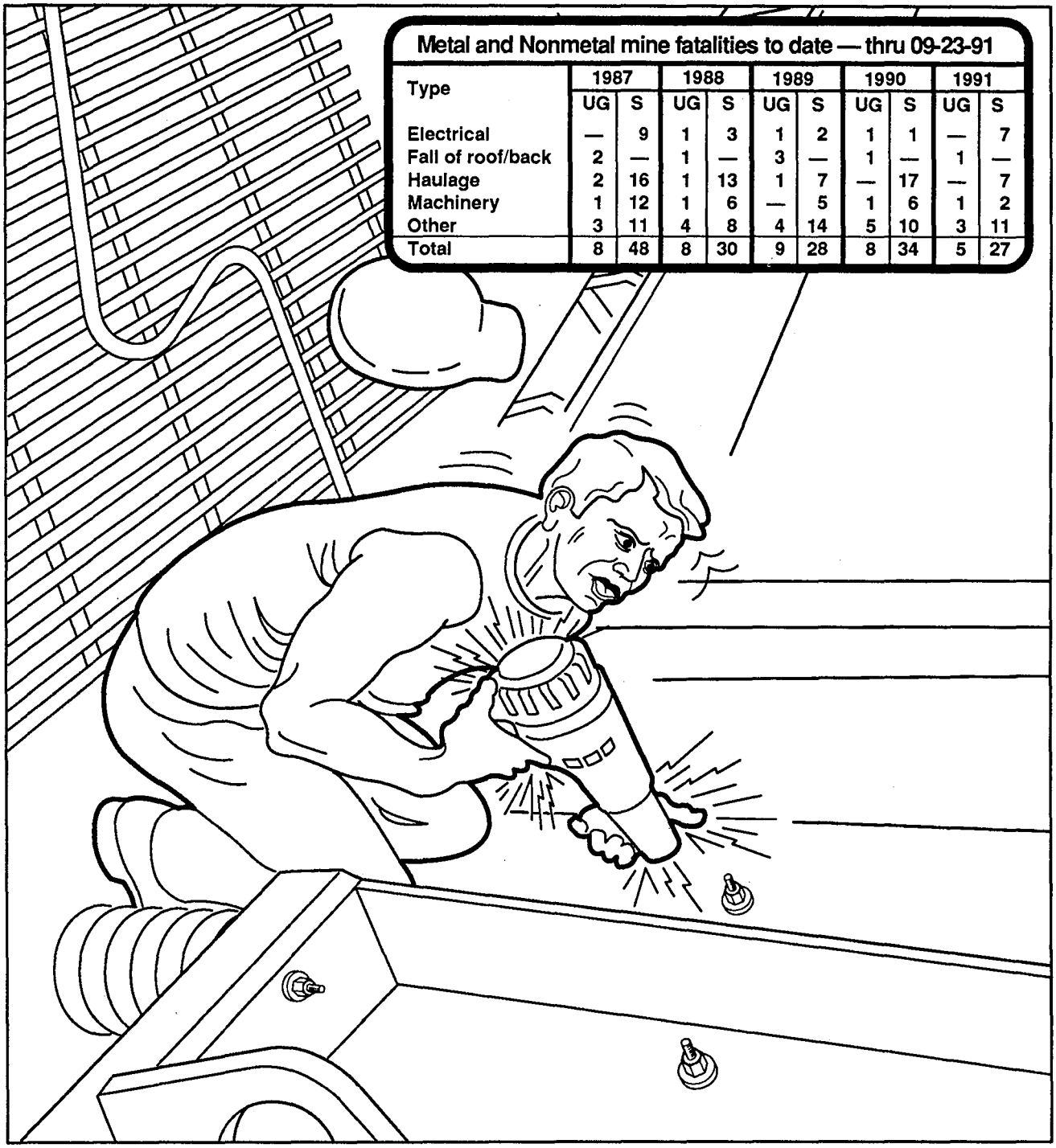
DESCRIPTION OF ACCIDENT: The night foreman came in at his regular starting time of 6:00 p.m. and continued the screen changing that the day shift had begun. The night foreman's crew came in at 7:00 p.m. and the victim and a welder were assigned to the screens. The foreman thought more help was needed, so about 8:30 p.m., he saw two lubricators and told them to go help the victim and the welder. The foreman then left to go to the upper plant. The victim and the welder checked the screens for holes, pulled two screens from the second deck, and started to put the side rails of the screen deck on the frame.

The day shift crew had used the impact wrench earlier without incident. However, it was only used in reverse to loosen bolts.

At about 5:45 p.m., the loader operator used the impact wrench with a company-owned extension cord and he noticed that the ground prong on the wrench's power cord was missing, but he did not mention this to anyone.

At about 7:30 p.m., the victim unplugged the wrench and dropped the extension cord off of the screen plant's catwalk. He told another welder that the night crew wasn't going to use the wrench. The welder loosely coiled the cord at the base of the plant and left at about 7:45 p.m. The victim's personal extension cord reel was not seen on the catwalk at that time. Apparently the victim decided that the impact wrench was needed after all, and went to his pickup, got his cord reel, and plugged in the wrench.

The welder had climbed into the screen plant and had fed the side bolts through the holes in the frame. The victim was sitting on a support I-beam on the outside of the frame directly opposite the welder. The victim had the impact wrench in hand. At about 8:30 p.m., the two lubricators came up and asked the victim what they could do to help. He told them to take the screens that were leaning on the spray bar (on top of the plant) and slide them onto the middle deck. They turned away and had walked about 15 feet up the catwalk when they heard a moan-



Metal and Nonmetal mine fatalities to date — thru 09-23-91

Type	1987		1988		1989		1990		1991	
	UG	S	UG	S	UG	S	UG	S	UG	S
Electrical	—	9	1	3	1	2	1	1	—	7
Fall of roof/back	2	—	1	—	3	—	1	—	1	—
Haulage	2	16	1	13	1	7	—	17	—	7
Machinery	1	12	1	6	—	5	1	6	1	2
Other	3	11	4	8	4	14	5	10	3	11
Total	8	48	8	30	9	28	8	34	5	27

ing sound. They both turned around and saw the victim with the wrench in his hands, back and body rigid, head back and mouth open, with his hair sticking straight out beneath his hard hat.

The welder was holding a bolt flush with the frame with the side of his foot. The victim had turned the forward/reverse control on the rear end of the drill back and forth several times and pulled the trigger, but nothing happened. The switch on the wrench had been defective for months, and users often had to fiddle with it to get the wrench to work in the forward direction.

The welder could partially see the

victim raise the wrench up and put the rear end of it against his sweaty chest. The victim's right hand was on the pistol grip, and his left hand alongside the left part of the wrench casing. He apparently was going to test it once more when he pulled the trigger, as the socket had not yet been put on the drive. The welder believed the wrench never started running. He saw the victim straighten and become rigid, and grunt three times. He knew the victim was being electrocuted, so he started to climb out of the screen plant and jump to the conveyor belt that was several feet below him.

The two lubricators ran to help the victim. One almost grabbed the victim, but was warned away. They then pulled the plug separating the extension cord from the wrench power cord. The instant this was done, the victim dropped the wrench and slumped down. The lubricators reached over the fence guard and grabbed his shirt to keep him from also falling to the ground. They maneuvered him a few feet to the edge of the catwalk. By this time, the welder was standing on the conveyor belt below. All three men lowered the victim to the belt and laid him out. The victim was unconscious, his eyes open, breathing slowly and erratically, but with no detectable pulse. He stopped breathing, so CPR was started while the welder went for help. Within a few minutes, several more men came to the area and helped. The night foreman was called on the radio to inform him of the accident. He called for an ambulance and also called for a med-evac helicopter. Personnel from the ambulance service arrived about 9:15 p.m. and took over CPR duties. The helicopter arrived shortly thereafter and landed in a nearby pasture. The victim was transferred to the helicopter at 10:26 p.m., and taken to the medical centerwhere he was pronounced dead a short time after arrival.

CONCLUSIONS: The accident was caused by a defective impact wrench that developed a ground fault to its metal casing. The absence of the grounding prong on the wrench's power cord and on the extension cord, and the lack of continuity at the outlet, prevented the ground fault from being transmitted to the over-current device. The potentially dangerous condition of the defective rotational direction switch had not been corrected.

In addition, the following conditions contributed to the likelihood of the accident happening:

- An employee was allowed to use his personal extension cord at the mine without routine inspection and approval by management. The grounding prong on the personal extension cord was missing.
- The company did not have an inspection procedure for reporting defects on hand tools to management.
- Training of hand tool operators was insufficient in hazard recognition. The forward switch on the wrench had been defective for months, and no one apparently tried to have it repaired.
- Installation screws for the outlet receptacle were used to establish continuity of the equipment grounding circuit. When the screws loosened, the ground would be lost.

Silica dust, SiO_2
Danger in and around mines

Silica is one of the most abundant minerals in the earth's crust. Recognition and prevention of exposure to silica dust are most important because of the concealed nature of chronic silicosis, the lack of effective treatment, and the progression of the disease even after exposure has ceased.

Free silica naturally occurs in rocks, clays, and soils. Sand deposits are high in silica content and typically contain more than 95 percent silica.

- sandstone, flint—100%
- granite—20%-70%
- slate—40%
- Fuller earth/shales—10%
- negligible levels in limestone, marble

Free silica dust is a solid particulate capable of suspension in air for several hours. The settling rate of an individual particle is governed by size, shape, density, and speed of the particle.

Size comparison

1/2 to 10 microns—respirable dust
1/2 to 50 microns—invisible to naked eye
1/2 to 75 microns—thickness of notebook paper
30 to 120 microns—diameter of human hair

Critical factors influencing dust exposure

- Concentration of airborne dust in the breathing zone
- Percentage of free silica in dust
- Size of the particles in airborne dust
- Length of exposure time
- Resistance powers of the individual worker
- Presence or absence of complicating factors (infection)

Health effects

Excessive exposure to silica (quartz) dust having particle diameter ≤10 microns can cause permanent changes in lung tissue including the related vascular and lymph system. The lung, as an organ, is a highly efficient dust collector that serves as a humidifier, cleaner, and the primary processor of gas exchange.

Safe work practices

Modifying dust producing processes and machinery can help to minimize worker exposure at the source.

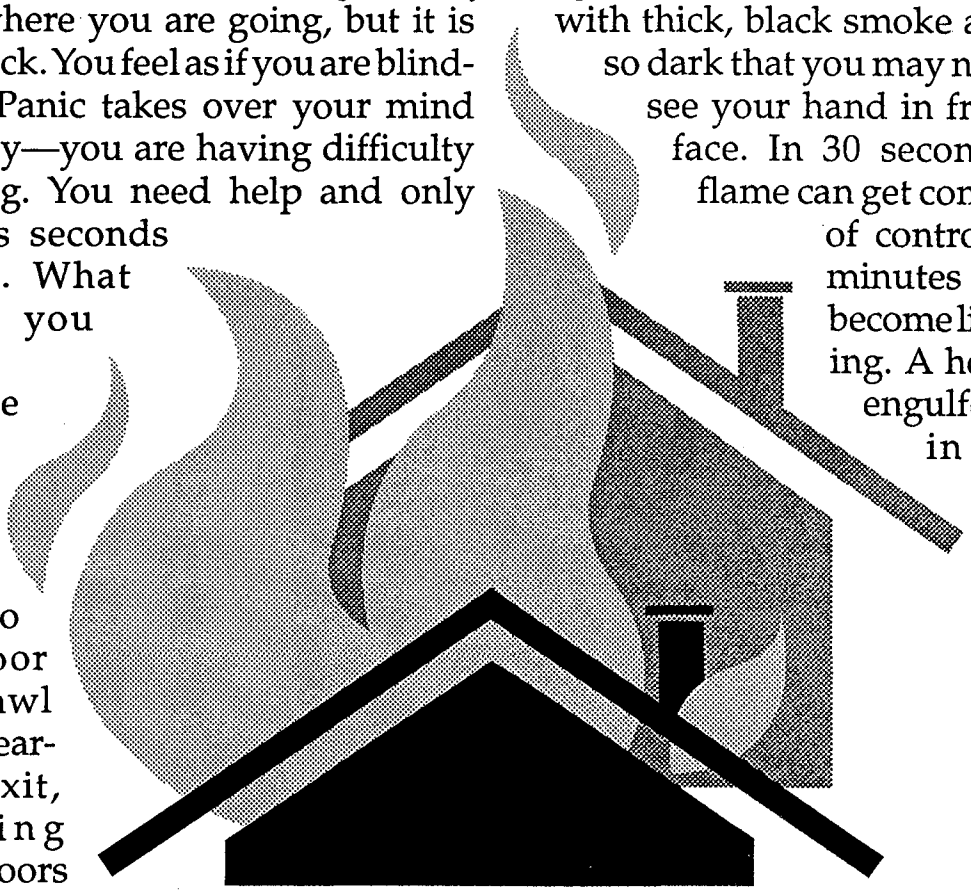
- Use the dust controlling devices that are provided—such as water sprays, detergent kits, and dust collection systems.
- DO NOT operate dust generating equipment unless the dust control devices are installed and working properly.
- Keep floors and work areas free from dust with ventilation systems or wetting agents. (Vacuum instead of sweeping.)
- Avoid areas where dust is present. Administrative control measures and appropriate warning signs, barricades, and work practices can be used to restrict access to unauthorized workers.
- Maintain a complete respirator protection program for all workers exposed.
- Ensure proper wear and fitting of approved MSHA or NIOSH respirators (especially after cleaning and repairing).

North Carolina Department of Labor, May 1991

Home fires are often deadly!

But planning and practice help

The smoke alarm is blaring. You try to see where you are going, but it is pitch black. You feel as if you are blindfolded. Panic takes over your mind and body—you are having difficulty breathing. You need help and only precious seconds are left. What should you do?



The answer to this question is to drop to the floor and crawl to the nearest exit, checking closed doors with the back of your hand so you do not enter a room full of flames. Once outside, call the fire department.

Approximately 5,000 people die in fires every year, according to the National Safety Council (NSC).

"Many unfortunate myths about fire are created by television shows and movies," says Ann Daubach, fire safety specialist at NSC. These misconceptions include: You can see by the light of the fire; it takes a long time for fire to spread; you'll have time to gather keepsakes; a fire's heat isn't life-threatening.

The facts are just the opposite. During a fire, a room can fill up quickly with thick, black smoke and become so dark that you may not be able to see your hand in front of your face. In 30 seconds a small flame can get completely out of control, and in 2 minutes a room can become life-threatening. A house can be engulfed in flames in a mere 5 minutes.

Most people die even before flames can reach them because poisonous smoke and gases can make a person pass out in less than 2 minutes. In addition, a fire's heat can be even more hazardous to a person than its flames. The air can become so hot it can sear your lungs—not letting you breathe, and so hot your clothes may fuse to your skin.

Be aware that most fires in the home happen between 10 p.m. and 6 a.m. Most victims die from smoke and poisonous gas inhalation long before flames reach them.

Everyone should install UL or FM labeled smoke detectors that sense smoke and sound an alarm that will wake you in time to escape. Detectors

should be placed on the ceiling or high on walls outside bedroom areas. In a multilevel home, each level should have a smoke detector.

Smoke detectors should be tested monthly, especially when children are present. This allows children to learn what the smoke detector sounds like, and they will be less afraid if it goes off in a fire.

The batteries should be replaced annually. Non-working detectors are a growing problem and about one-fourth of all U.S. homes have non-operational detectors. Dead or missing batteries was the main reason cited by researchers for non-functional detectors.

In order to remember to change the batteries, NSC recommends making it a special occasion, such as a birthday.

All families should get together to discuss and practice a fire escape plan. Be sure to have a main and alternative exit for each room, if possible.

If you live in an apartment building with elevators, leave elevators out of your escape plan. Use the stairs and head down. If your path is blocked by smoke or fire, go to the roof. Make sure in your planning that the roof is accessible in an emergency.

Always specify a place outside to meet, such as a tree or other landmark, in order to ensure that everyone escapes safely.

Special attention should be given to older persons and children during a fire. Fires are the leading cause of accidental deaths in the home for children, and every year more than 1,300 adults over the age of 65 die in fires.

Children need to be taught what to do in case of fire. They often become afraid and hide under beds and in closets, making it extremely difficult for rescue workers to locate them.

Offer to check smoke detectors for disabled and older adults.

Escaping without injury

If a fire does break out in your home, there are safety steps that can be followed to give you time to escape.

After hearing the alarm, roll out of bed and, if there is smoke in the room, get below it. Make your way to the door and test the temperature of the door with the back of your hand as high up as you can reach. If the door feels cool, crack it open and check for smoke. If all is clear, follow your regular escape route. Test all doors and close them behind you.

If your first escape route is blocked, use an alternate plan. If you're on the first floor you can climb out the window. On higher floors, if there is a balcony or roof outside your window, wait there. Have an escape ladder available to climb down from second or third story windows.

Once you are outside, use a neighbor's phone to call the fire department. If you have designated a meeting spot in an escape plan—go directly to the spot.

Home fires are a very serious, potentially life-threatening situation and fire prevention education is important. NSC urges people to establish and practice fire safety.

Reprinted from the Morenci Copper Review, Volume 7, Number 2, May 1991. Originally published by the National Safety Council.

Semantics and fire safety

Words and phrases have many shades of meaning. A word that means one thought to the writer is often interpreted quite differently by the reader. The field of fire protection is no exception to this failing, and the word "fireproof" is a notorious example.

Steel framework may be designated as fire proofed. Use of this terminology is unfortunate because it often leads to an entire building being called fireproof. The obvious flaw is that "fireproof" refers only to the structure and probably ignores the content. The layman, on the other hand, may interpret the use of this term as an indication that fire is impossible or highly unlikely within the building.

"Noncombustible" certainly sounds reassuring and positive enough, but an investigation of current usage will show that this term can depict anything from inert asbestos to materials with a flame spread rate up to 25. And what is meant by "flame-retardant" or "self-extinguishing"? In many cases, these relative terms denote comparative differences between small laboratory samples which may not be applicable to large-scale building installations.

It is not the choice of words that cause semantic difficulties. Most of us are prone, through mental laziness, to accept words without fully questioning meanings. Advertising today capitalizes on this. A product "tastes better." Better than what? We never stop to ask.

In fire protection there is too much at stake for us not to be skeptical. Know what the words mean.

Reprinted from ***Mine Safety Sense****, Jan-Mar 1991, a monthly publication of the Nevada Department of Industrial Relations, Division of Mine Inspection.*

Protective clothing not enough

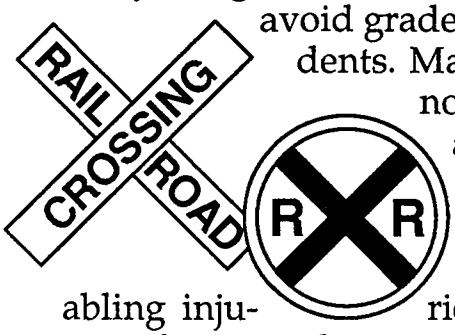
A Bureau of Labor Statistics (BLS) study of 1,313 heat injuries resulting in workers' compensation claims in May 1985, revealed that two-thirds of those burned were wearing personal protective equipment (PPE). Most of the injuries were to areas of the body not protected by the gloves or other gear, and occurred when workers came in contact with something hot. Because most of the injured workers had been on the job at least a year, lack of experience could not be blamed for the injuries. However, BLS reported that only three in 10 people understood that PPE was intended to protect them against burns.

Reprinted from the May 1990 issue of the National Safety Council's ***Safety & Health*** *magazine.*

Railway-highway crossings

Danger in and around mines

Look-listen-live



By using common sense, drivers can avoid grade crossing accidents. Many people do not realize that at a crossing, a collision with a train will cause disabling injuries or death. Far too often people ignore the flashing lights, signs, and bells in a rush to beat a train. The table below shows what has happened at North Carolina crossings:

North Carolina cases	*1988*	*1989*	*1990*
Reported	*244*	*188*	*194*
Injuries	*85*	*85*	*74*
Deaths	*20*	*22*	*14*

Federal Railroad Administration

Over seventeen years ago, a program called *Operation Lifesaver* was created to reduce railway/highway accidents. The program has grown nationally with two major railroads, Norfolk Southern and CSX Transportation, forming a nonprofit program in North Carolina to teach people about the dangers of railway/highway crossings.

Safety measures

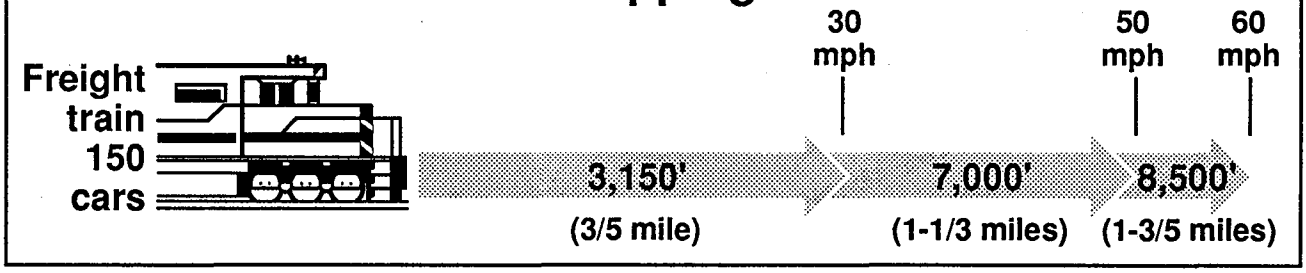
- Expect a train on any track, in any direction, at anytime.
- Don't get trapped on a railway/highwaygrade crossing. Make sure you can clear the tracks before crossing.
- If you do get stuck on the tracks, get everyone out immediately and walk alongside the tracks toward the approaching train.
- When waiting at a crossing for a train to pass, watch out for a second train from the other direction.
- Neverweavearoundcrossinggates.
- Watch out for vehicles that must stop at grade crossings.
- Don't misjudge the train's speed and distance.
- When approaching a grade crossing, decrease speed and be especially careful at night, when your view is limited.

For more information on speakers and training materials, contact North Carolina Operation Lifesaver, Inc.; 5540 Centerview Drive, Suite 200-M; The Koger Center—Yancey Building; Raleigh, North Carolina 27606. Attention: Jane H. Mosley, State Coordinator. Phone: 919-233-0025.

For out-of-state information call: National Operation Lifesaver Office at 1-800-537-6224.

Crossing Tracks Safely, Operation Lifesaver, North Carolina Department of Labor, Mine and Quarry Division, May 1991

Estimated stopping distances



Fitness—Recognizing the common cold

By Gene M. Greeley

At one time or another, everyone of us succumbs to the common cold. The bravest, the sweetest, the smartest—our virtues matter not to these viruses as they set about reducing us to coughing, sneezing shadows of our former selves. Worse yet, scientists have yet to provide us with a cure for the cold viruses.

Colds, "flu," sore throats, ear pain, stuffiness, runny nose, cough, hoarseness, swollen glands, nosebleeds; all are complaints of upper respiratory problems.

These symptoms can be caused by a virus, bacteria, or an allergic reaction. Knowing the difference is important due to the fact that viral infections and allergies do not improve with treatment of "penicillin" or other antibiotics.

Further, to "demand" a penicillin shot for a cold or allergy is to ask for a drug reaction or risk a more serious "superinfection," in addition to wasting one's time and money.

On the other hand, failure to recognize a serious complication of a cold or a bacterial infection may risk simple treatment and delay your recovery.

So, what are the critical signs and symptoms that should alert you to seek professional help?

A good "rule of thumb" is that a bacterial infection usually only involves a single complaint, that is, sore throat, earache, sinus pain, or cough.

For example, the bacterial infection of the respiratory tract by strep is usually limited to the throat. Occasionally, one can encounter a fever and swollen lymph glands (from draining the infected material) in the neck.

On the other hand, the viral "flu" can produce a high fever, excruciating headache, muscle aches and pain (especially in the lower back and eye muscles), nausea, vomiting, diarrhea, and crampy abdominal pain.

Experts have suggested that answering "yes" to any of the following questions may indicate the need for professional care:

1. Are any of the following present in a child?
   a. Rapid or difficult breathing
   b. Wheezing
   c. Marked irritability or lethargy
   d. Difficulty in swallowing
   e. Abnormal drooling
   f. Cough sounding like seal's bark, which doesn't improve with steam and drinking fluids
2. Is patient less than 3 months of age?
3. Is infant rubbing, pulling, or tugging at ears, or does patient feel more than mild ear discomfort?
4. Has the cough produced thick, foul-smelling, rusty, or greenish sputum?
5. Is drainage from the nose foul smelling, one-sided, or a color other than clear, white, or light yellow?
6. Is the throat more than mildly sore?

7. Is there severe difficulty in swallowing, difficulty in breathing, or excessive drooling in a young child?

8. Are any of the following conditions present?

A. A temperature of 101 degrees or greater

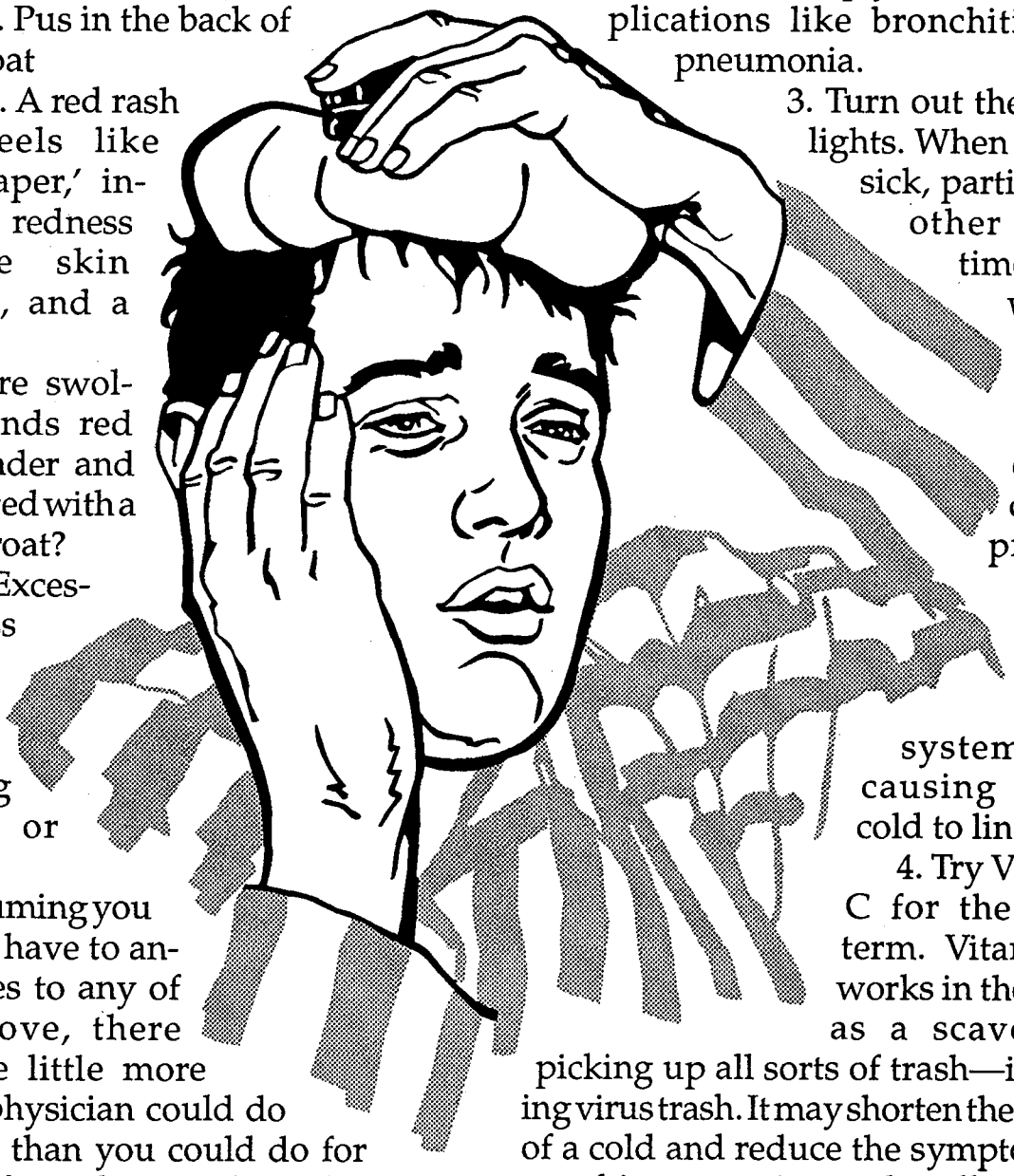
B. Pus in the back of the throat

C. A red rash that feels like 'sandpaper,' increased redness in the skin creases, and a fever.

9. Are swollen glands red and tender and associated with a sore throat?

10. Excessive loss of appetite?

11. Aching lungs or chest?



Assuming you did not have to answer yes to any of the above, there may be little more that a physician could do for you than you could do for yourself. In other words, with a little common sense, the common cold should be self-limiting to 7 days. If you see a doctor, you will probably get over your cold in a week.

So here are a few tips from the experts on taking care of yourself:

1. Be positive. A positive attitude about your body's ability to heal itself can actually mobilize immune system forces.

2. Rest and relax. Extra rest enables you to put all your energy into getting well. It can also help you avoid complications like bronchitis and pneumonia.

3. Turn out the party lights. When you're sick, parties and other good times can wear you out physically, compromising your immune system and causing your cold to linger.

4. Try Vitamin C for the short term. Vitamin C works in the body as a scavenger, picking up all sorts of trash—including virus trash. It may shorten the length of a cold and reduce the symptoms of coughing, sneezing and stuffiness.

5. Warm up. Keep bundled up against the cold; let your immune system stay focused on fighting your cold infection rather than displacing your energy to protect you from the cold.

6. Take a walk. Mild exercise im-

proves your circulation, helping your immune system circulate infection-fighting antibodies. Refrain, however, from strenuous exercise which could wear you out.

7. Lighten up the diet. The very fact that you have a cold in the first place may point to your eating "too congesting a diet." Counteract it by eating fewer fatty food, meat and milk products, and using more fresh fruit and vegetables.

8. Load up on liquids. Drink six to eight glasses of water, juice, tea, and other mostly clear liquids daily. This will help clear the system and can relieve some of the chest and head congestion. Fluids help to keep the mucus thinner and help prevent complications such as bronchitis and ear infections. Do not stress your system, however, by drinking alcohol during this time.

9. Soothe with saltwater. Relieve an irritated throat by gargling morning, noon and night; or whenever it hurts most. One teaspoon of salt in a glass of warm water is adequate.

10. Chicken soup. Dizziness when standing up is common with colds and is helped by drinking salty liquids, bouillon and chicken soup. Chicken soup also appears to possess an additional substance to unclog your nasal passages and increase the flow of nasal mucus.

11. Moisture and humidity. Both of these are important in keeping the mucus thin. Taking a steamy shower or bath can help clear congestion. Use of a vaporizer is recommended in dry climates and where forced-air heating is used during the winter.

12. Medicate at night. If you chose to take OTC ("over the counter") medication during the day, use those that only treat your specific symptoms. Leave the "mega-cures" and combination drugs to use at night when undesirable side effects will not be a problem. OTC medications fall into four broad categories: pain relievers, decongestants, antihistamines, and combinations of the first three. A word of caution: antihistamines tend to dry up secretions and make them thicker which will complicate a "dry" cough. This is another reason for increasing your fluids during this time.

A final word of caution should be noted any time you choose to treat yourself. In the event that your symptoms do not seem to improve in a relatively short time, get worse, or lead to secondary infections, you should consider a visit with the physician.

Reprinted from the Morenci Copper Review, Volume 7, No. 3, August 1991 which, in turn, was excerpted from TAKE CARE OF YOURSELF by Donald M. Vickery and James F. Fries, Addison-Wesley Publishing Company, Inc. and THE DOCTOR'S BOOK OF HOME REMEDIES, by Debora Tkac, Rodale Press, Inc.

Tips for cycling safety

With today's emphasis on physical fitness and because of the pleasure derived from the sport, the number of cyclists is growing at an amazing rate. Unfortunately, the number of bicycle accidents is also growing.

The National Highway Traffic Safety Administration estimates that 90,000 car/bike accidents are reported to police every year, with 84,000 cyclists suffering an injury. These statistics are alarming and suggest that safety should be a high priority for all cyclists.

To prevent injury, the following is recommended:

- Ride on the right side of the roadway with traffic. If you are with a group, ride single file.
- Ride defensively.
- Be alert for the unexpected.
- Wear brightly-colored clothing.
- Slow down at intersections and be extremely careful when making turns.
- Use hand signals to indicate turning or stopping.
- Protect yourself at night with required reflectors and lights.
- Maintain bike in good mechanical condition and carry tools for emergency repairs.
- Wear a helmet.
- Observe all traffic signals and signs.
- Use bicycle paths where they are provided.
- Carry a card with emergency information in case of an accident.

Riding provides transportation, exercise, and enjoyment; but remember, accidents can spoil your ride. So, continue enjoying your cycling by following these tips for cycling safely.

Reprinted from the April 1986 issue of ***Bicycling*** *magazine.*

The Secretary's message...

Since becoming Secretary of the Holmes Safety Association 5 months ago, the organization has continued to move forward in encouraging new members to join such a fine organization. We now have a membership of more than 7,000.

Last month, HSA added a new State Council in Minnesota. This is the fourth state council in the Association. The other state councils are Illinois, Pennsylvania, and West Virginia. The Minnesota Council is also the first Metal/Nonmetal state council.

Several states have expressed an interest in forming a state council. The following states are likely to form a state council before May 1992: Kentucky, Ohio, and Virginia.

Over the past 5 months, we set up three new District Councils. These new councils are in Massachusetts and Kentucky (2). Additional councils will be set up in Kansas, Kentucky, Ohio, Oklahoma, and Tennessee over the next few months.

HSA is moving forward in making new safety material available to the district councils and their members. This material includes a substance abuse tape, safety around abandoned mines program, and a first aid video.

The HSA Executive Committee is preparing an agenda for the National HSA Meeting in Split Rock, Pennsylvania. The annual meeting will be May 26-28, 1992. Look for additional details in next month's HSA Bulletin.

Slogan campaign

The Holmes Safety Association Executive Committee is requesting your support in submitting a slogan for 1992. Our 1991 slogan was ***"Get It Done in 91."*** The slogan must be very brief and end with the words "in 92." The Executive Committee approved an award of a $100 U.S. Savings Bond to the person who submits the winning slogan.

Please submit all entries to the following address:

Holmes Safety Association
c/o Robert Glatter
4015 Wilson Boulevard Room 537
Arlington, Virginia 22203-1984

All entries must reach Arlington, Virginia, by December 12, 1991. The winning slogan will appear in the February 1992 Bulletin.

Seventy years accident-free!

Joseph Youch (second from left) of Mahanoy City is the guest of honor at recent luncheon during which he is presented with the Joseph A. Holmes Safety Award. Youch was an employee of the Reading Anthracite Company for 70 years without having incurred an accident. Others (from left) are Dave Wolfe, Reading safety officer; Thomas J. Ward Jr., Pennsylvania Department of Environmental Resources director of mine safety and first vice president of the Holmes Safety Association; John Shutack, district manager. Ward holds a special citation for Youch from state Senator James J. Rhoades.

*Reprinted from the June 17, 1991, issue of the Shenandoah, Pennsylvania, **Evening Herald.***

The last word...

"Resolve to be cheerful and helpful. People will repay you in kind."

"Resolve to be tender with the young, compassionate with the aged, sympathetic with the striving and tolerant of the weak and the wrong. Sometime in life you will have been all of these."

"Be wary of giving advice. Wise men don't need it and fools won't heed it."

"Compromise is the art of cutting a cake so that everybody believes he or she got the biggest piece."

"The fact that you'll never reach perfection is no excuse for aiming at less."

"The nice thing about being imperfect is the joy it brings to others."

"Most folks will accept criticism they think is meant for someone else."

"We grow a little every time we do not take advantage of somebody's weakness."

"The kindest word in the world is the unkind word unsaid."

"An optimist is someone who sees the light at the end of the tunnel. A pessimist is someone who sees the optimist as the one who got him in the tunnel in the first place."

NOTICE: We welcome any materials that you submit to the Holmes Safety Bulletin. We cannot guarantee that they will be published, but if they are, we will list the contributor(s). Please let us know what you would like to see more of, or less of, in the Bulletin.

REMINDER: The District Council Safety Competition for 1991 is underway – please remember that if you are participating this year, you need to mail your quarterly report to:

Mine Safety & Health Administration
Educational Policy and Development
Holmes Safety Bulletin
4015 Wilson Boulevard, Room 531
Arlington, Virginia 22203-1984

Phone: (703) 235-1400