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# professional protection magazine

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## WATER-BASED PAINT — not as harmless as it sounds. . .

In an **article** in the Scandinavian safety magazine, *Arbetsmiljö*, Three Swedish professors of occupational dermatology express their concern about preservatives used in water-based paints, glues and common materials. This is an abridged version of the article.

Virtually all water-based (water soluble) paints contain preservatives in order to prevent the occurrence of bacteria, fungi and algae. The preservatives are biologically active, and may cause allergic contact eczema to people working with the paints.

All known preservatives may cause skin allergies, however, the effects vary according to the type of product, duration of exposure, and whether the skin is intact or damaged.

Nipa esters (parabenes) are normally used in skin cremes and cosmetics, because of their minor allergenic effects. However, from a microbiological viewpoint, these preservatives are not suitable for a number of applications.

Skin allergies are common in people who are exposed to paint, glue and lubricants.

**ISOTHIAZOLONES** are preservatives that have made their way into various fields of industry lately. The chemicals are known by numerous product descriptions, including Cathone.

Isothiazolones are mostly used in paint and glue, but also in liquid soap, washing detergents, cosmetics and cutting oils.

It seems that isothiazolones are often described simply as "preservatives" on the product label. It is difficult or impossible to find out which preservative has been used, although some of the substances have been shown to be severely allergenic.

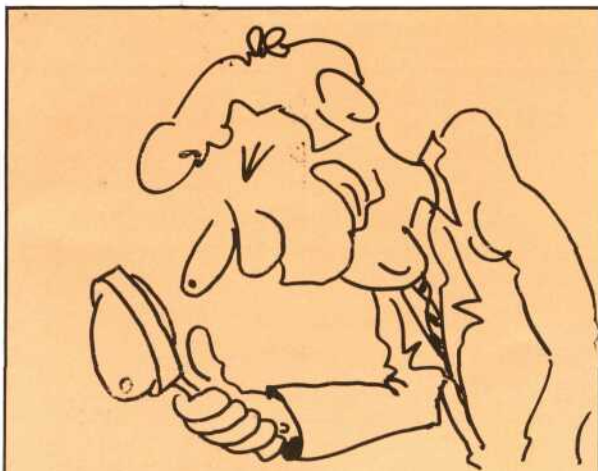
The wide use of isothiazolones means that a skin allergy may be first acquired at work, and that the eczema may then be maintained during home improvements or hobby activities (and vice versa).

Another preservative, dichlofluanide, has recently been labelled as a contact allergen. This substance is also used in water based paints.



(SOURCE: Bjorkner/Fregert/Wahlberg — *Arbetsmiljö* 2 1988.)

**N.B.** We are planning to present a major feature on skin allergies in the next issue of PPM. If you have any questions about allergies, or if you are experiencing skin problems, please write to us.



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# CALIFORNIA WARNING

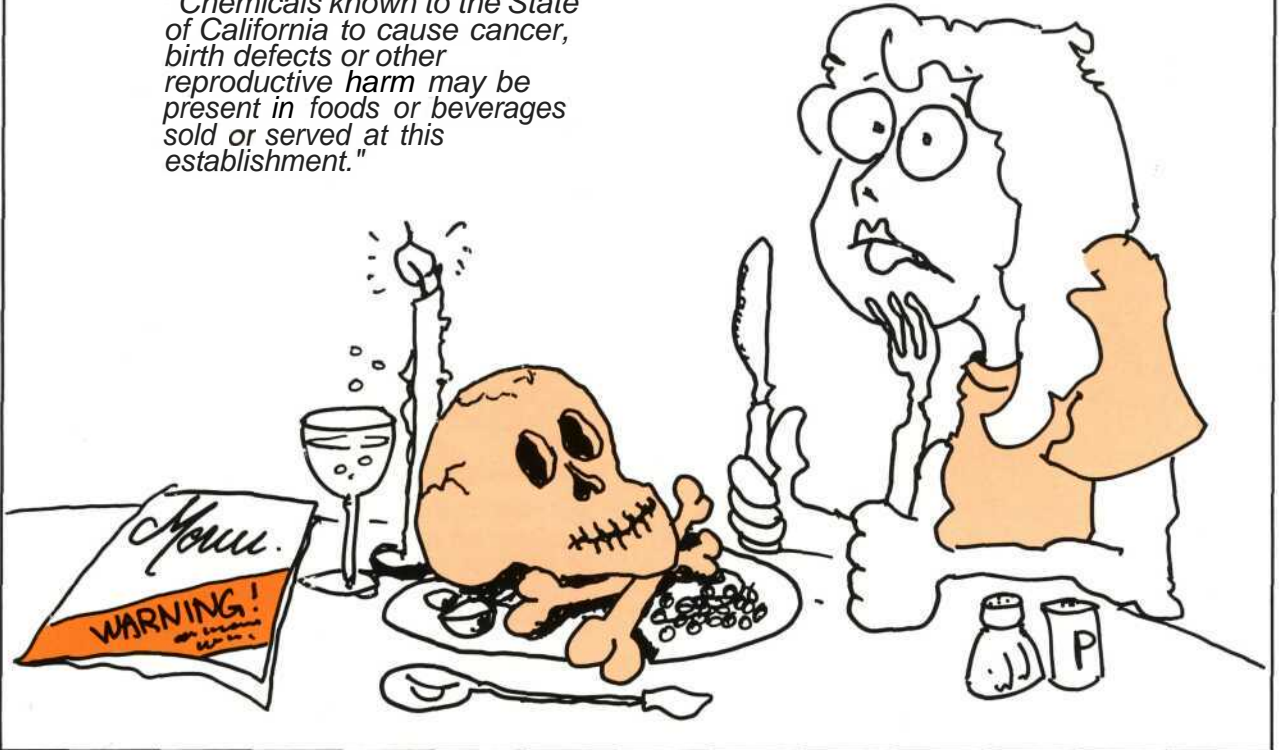
In a communique in March 1988, Associated Press reported that the State of California has now passed legislation to force all food outlets to warn their patrons of hazardous or potentially hazardous chemicals used in food or drinks as preservatives, colourings and additives.

For instance, a restaurant menu could carry a health warning similar to cigarette packs:

*"Chemicals known to the State of California to cause cancer, birth defects or other reproductive harm may be present in foods or beverages sold or served at this establishment."*

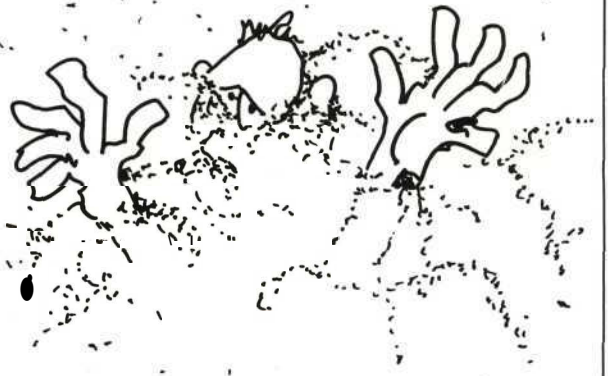
The new law requires companies to give a clear warning if they are using any of 29 chemicals, including asbestos, benzene, lead, chromium and arsenic. More substances are sure to be added to the list.

The law covers not only eating and drinking establishments, but any business where the customer may be exposed to the hazardous substances, such as petrol stations.



## Handy Hints

*Chemicals in powder form are often available in granules, flakes or pastes that don't create a lot of hazardous dust. Make the best choice!*



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# QUESTIONS AND ANSWERS

**Question: What is "Metal Fume Fever"?**

"Welder" - NSW

**Answer:** Metal fume fever is an illness reminiscent of influenza. It may be caused by inhalation of metal smoke or fume in welding, polishing, or melting of metals. The most common cause is Zinc fume, but several other metals are known to produce the illness.

The symptoms are usually fever, shivering, muscular pain, nausea, gastric problems, general fatigue and drowsiness.

The illness commonly occurs when the worker returns to work after the weekend of non-exposure. Therefore, the illness is also known as "Monday fever". In general, the fever passes after a day or two.

**Question: I have read that some chemicals may cause "CYANOSIS". What is it?**

S. Braeger — VIC

**Answer:** Cyanosis is a blue-grey discolouration of mucous membranes and skin, caused by low oxygen content in the blood. The colour change is most visible on the lips, mouth, ear lobes, eye lids and finger tips.

Cyanosis may occur as a result of chemicals that destroy the blood's ability to absorb oxygen, or by heavy gases that displace the air in a confined room.

(SOURCES: Hansson, Hellsten: 'Arbetsmiljoe fraan A till OE', Stockholm 1982; Proctor, Hughes: "Chemical Hazards of the Workplace", Philadelphia 1978)



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## FARMERS BEWARE!

A number of pesticides are now totally banned from agricultural use in NSW. The banned pesticides belong to the group of persistent organochlorines, and include the following members:

**Aldrin**      **BHC**  
**DDT**      **Chlordane**  
**Dieldrin**      **Endrin**  
**Heptachlor**      **HCB**  
**Lindane**

meat — even a single sample may — mean utter disaster for all Australian meat producers.

In order to eliminate further crises, Australian authorities are testing meat samples for residues.

If a meat sample exceeds the Maximum Residue Levels (MRL) set down by the National Health & Medical Research Council, the farm and the livestock will immediately be placed under quarantine. The property owner is interviewed, and the source of the contamination is located. Samples are taken regularly. The quarantine is not lifted until all livestock shows residue levels below MRL.

### IF YOU HAVE QUESTIONS. . .

Contact your local Department of Agriculture. Specific livestock queries may be answered by veterinary officers of the Department of Veterinary Inspectors in your local Pastures Protection Board.

Countless chemicals, ranging from ant dust to emulsifiable concentrate insecticides, contain organochlorines. If you are not sure whether a particular pesticide contains the banned chemicals, contact the Department of Agriculture.



(SOURCE: The NSW Farmer, October 1987; NSW Department of Agriculture)

There are numerous commonly used (and previously registered) pesticides which contain one or several of the above ingredients.

Read the contents list on your pesticide labels and make sure you aren't using any of them.

Heavy fines may be placed on farmers who still use the chemicals — even on those who hold stocks of the banned pesticides.

The only legal use of organochlorines is limited to sub-floor termite control of buildings well away from livestock and grain storage buildings. The reason is that livestock may absorb organochlorines even by licking fence posts, chewing pieces of timber, etc.

Last year, excessive levels of residual pesticides were recorded in Australian meat by US and Japanese authorities. The findings placed our entire meat export industry in jeopardy. Any further finds of contaminated

## Handy Hints



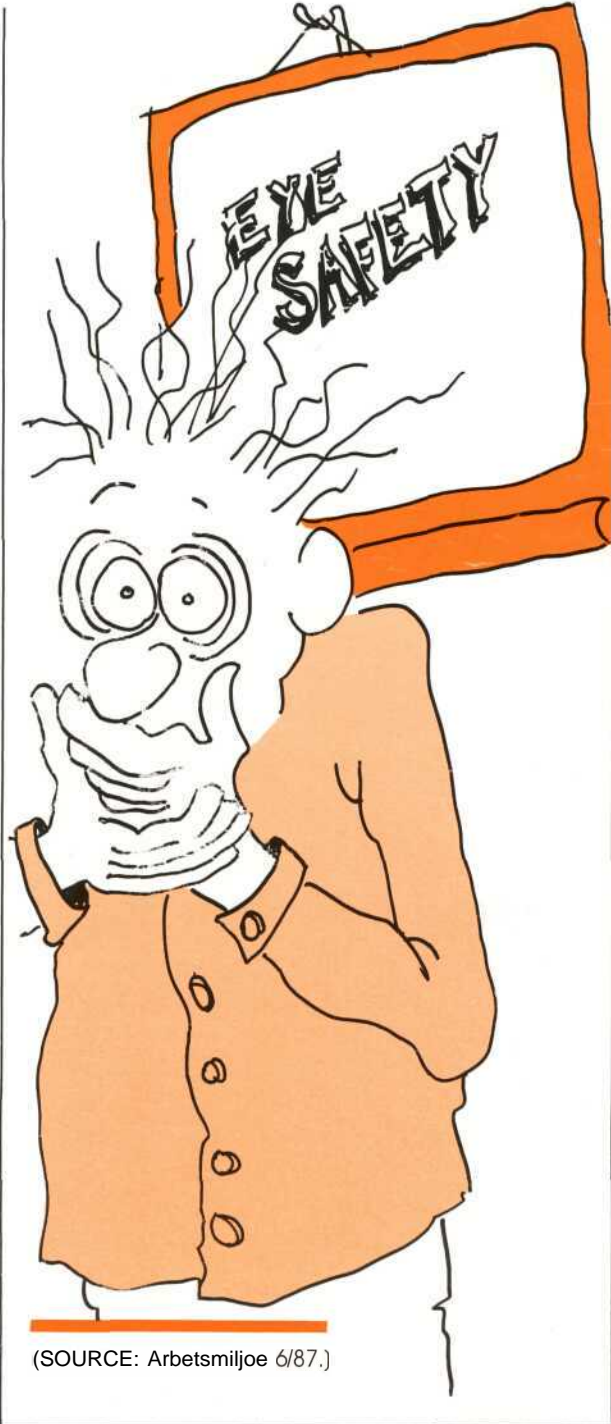
*Don't EVER use your mouth to suck a liquid into a siphon! Even the vapour may be harmful — and an accidental mouthful could cause severe damage! Use a siphon pump or primer.*

# THE HAZARDS OF SAFETY FILMS

Recently, a film about the dangers of not wearing safety goggles was shown in a British factory.

The film was so horrifying that 13 staff members had to be helped out of the auditorium by nursing personnel.

One scene was so realistic that a welder fell off his chair and had to have seven stitches. Another worker fainted with shock.



(SOURCE: Arbetsmiljoe 6/87.)

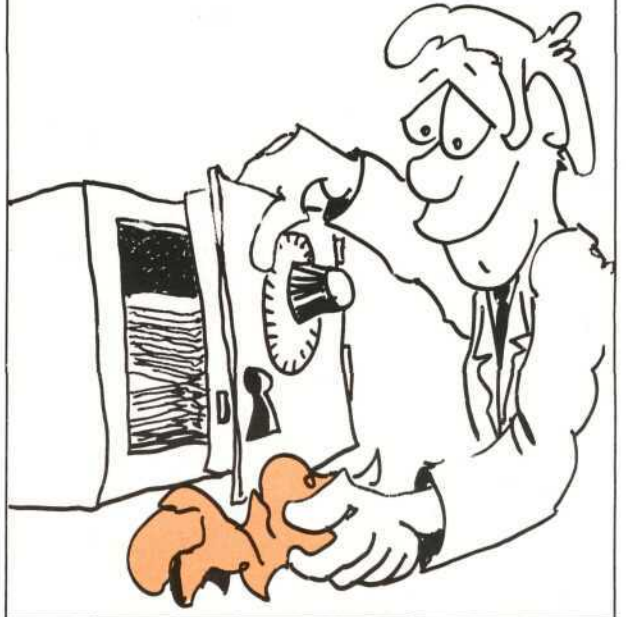
## Handy hints

Almost all non-flammable materials in powder form are **EXPLOSIVE!** All you need is a dust cloud and a single spark and **BANG!** Make sure you don't raise dust, and keep away from open flames and sparks.



## Handy hints

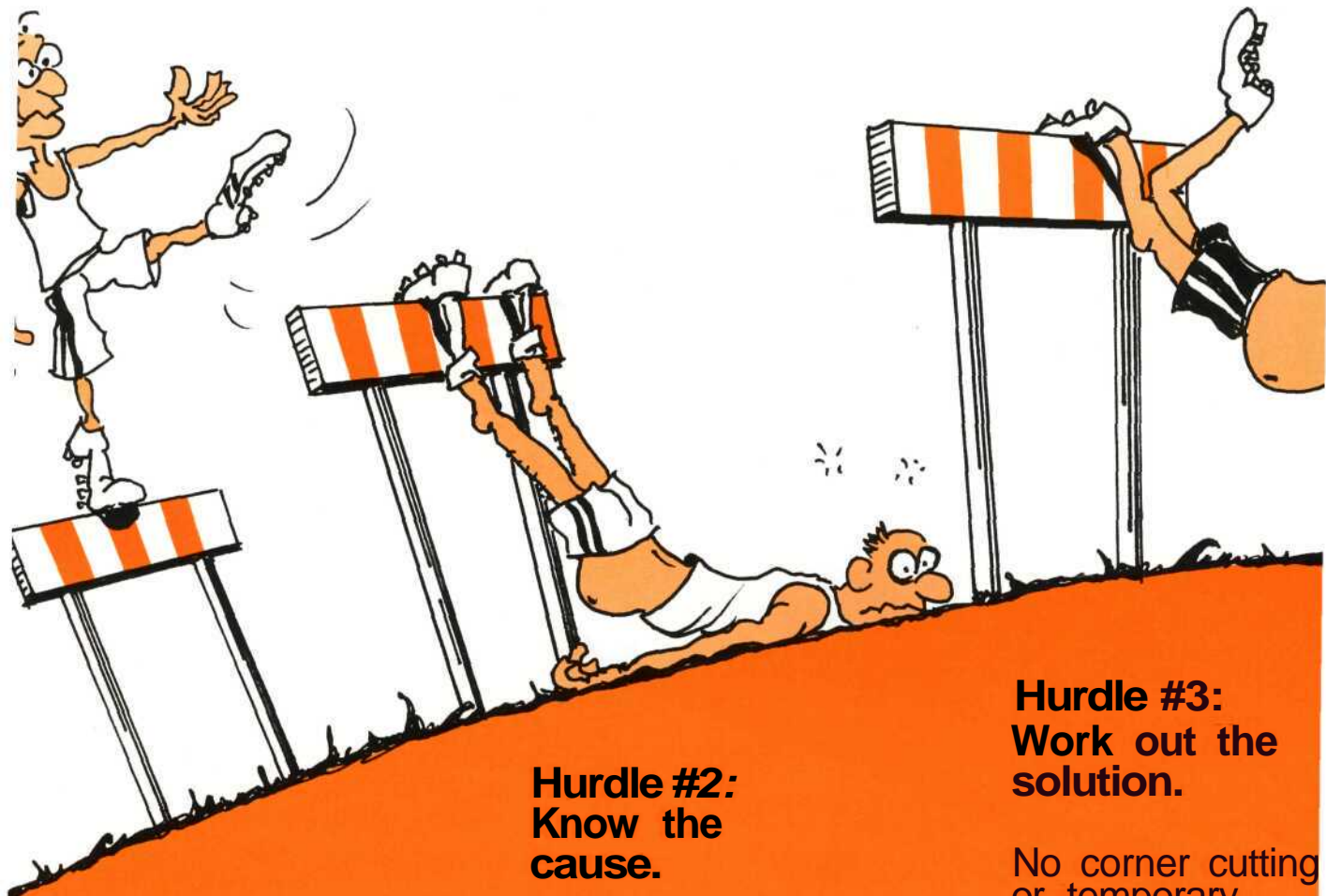
All soiled rags, towels and cleaning tissues should be disposed of in a **METAL** container with a **SEALED** lid!



THE PPM  
COLLECTION  
NUMBER 2

# The Safety HURDLES

There are six major hurdles to safety.  
Make sure your company is ready to take them.



## Hurdle #1: Accept the problem.

This is probably the highest hurdle. It takes both responsibility and guts to recognise the fact that there is a safety problem.

## Hurdle #2: Know the cause.

There's nothing to it: as soon as you accept that the problem exists, you'll know why it's there. All you have to do is to find out as much as possible about it.

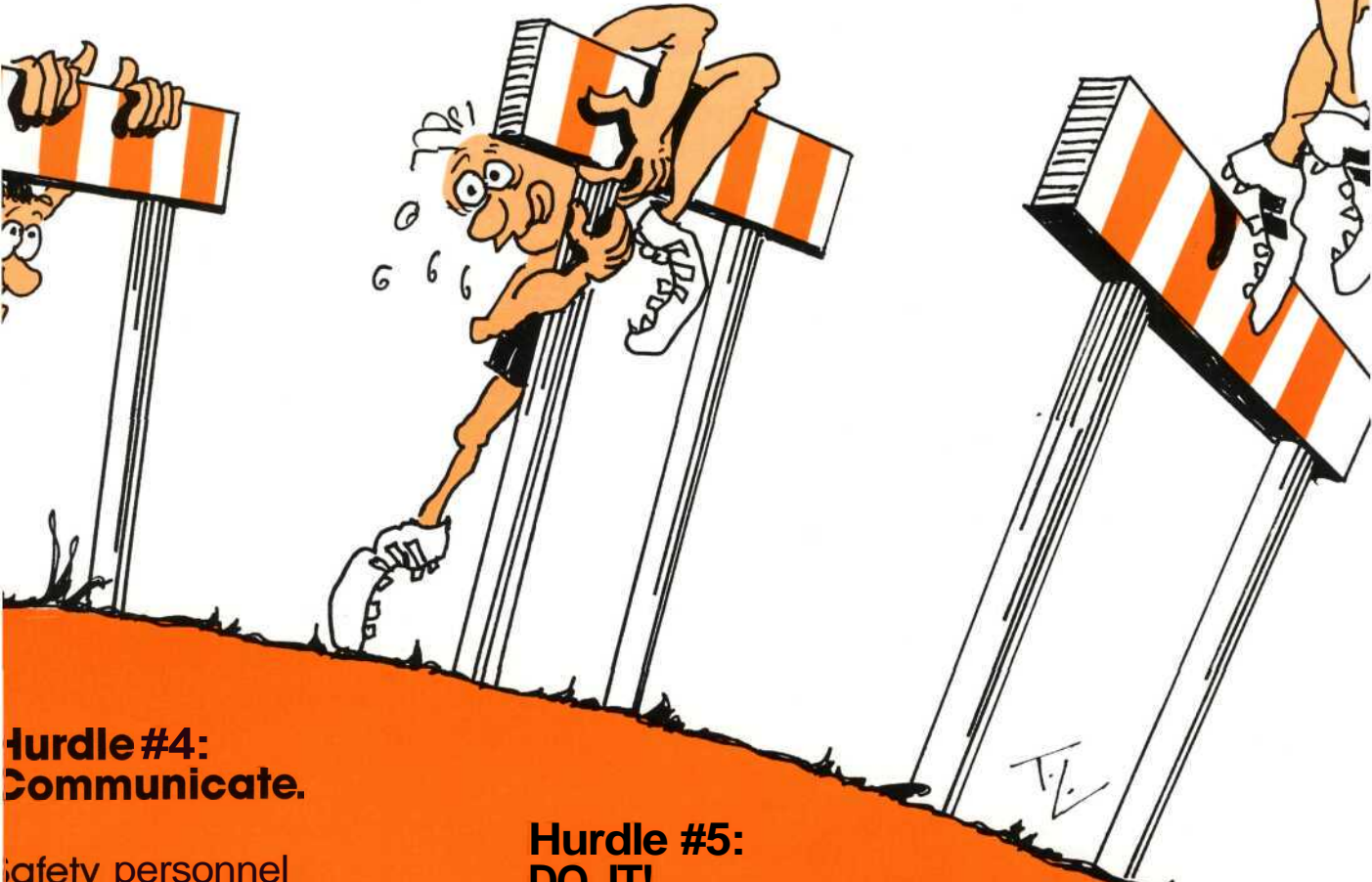
## Hurdle #3: Work out the solution.

No corner cutting or temporary band-aid remedies! Make sure the solution is an effective one, and that it will be handled by people who know what they're doing.

**KEEP IN MIND: The safety hurdle is**

# >LE RACE:

s in the safety race.  
n't trip over any of them.



## Hurdle #4: Communicate.

Safety personnel may not realise the initial cost of implementing the safety measures. Management may not see the long term cost saving of a proper safety scheme. There must be a close co-operation between the safety department and the financial section of the company.

## Hurdle #5: DO IT!

You've come a long way. Don't stop at words — start the action!

## Hurdle #6: Assess and adjust.

Congratulations, you've made it! The only thing you have to do now is to look at the result and make any final adjustments.

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# Special Feature

## CHEMICALS AND PREGNANCY

**PLEASE NOTE:** This article pertains to **EXCESSIVE** exposure, that is, prolonged or repeated exposure to mutagenic or teratogenic chemicals, or to ionising radiation. To the best of our knowledge, exposure to concentrations below the TLV is not likely to present a hazard, and the use of effective personal protection should further prevent any damage. It should, however, be borne in mind that "safe levels" for pregnant women are a contentious subject among occupational health scientists.

About three percent of all newborn babies are afflicted with some sort of birth defect. Later in childhood, another two percent can be added to that number.

Foetal damages include miscarriage, malformation, congenital illness and slow or delayed development.

The research into the causes of birth defects has yet a long way to go, and the great majority of cases remain unexplained by science:

**20% are due to hereditary factors**  
**5% chromosome damage**  
**5-10% environmental factors**  
**65-70% unknown causes.**

Chemicals, radiation and other factors in the environment may cause foetal damage in various ways:

### STERILITY

Some chemical substances cause sterility in both men and women. Once the damage is sustained, the person is unable to have children. A few examples of such substances include: Dibromochloropropane, Epichlorohydrin and Carbon Disulphide.

### BEFORE CONCEPTION

The sperm or the egg may be damaged before conception because either the father or the mother has been exposed to a chemical which causes damage to the genes.

This may result in miscarriage, malformation or congenital disease which may occur either from birth or much later in life. Cancer may also be caused by genetic damage.

### DURING PREGNANCY

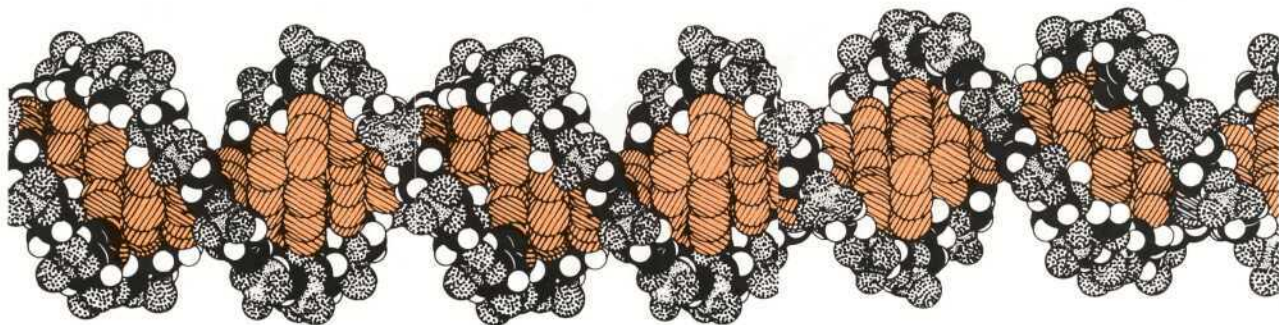
If the mother is subjected to dangerous substances while bearing the child, miscarriage, malformation, growth disturbances or mental retardation may result. (The Thalidomide scandal in the 1960s is a well known example.)

**GENETIC DAMAGES** are closely related to cancer. The damage may lead to hereditary disease, miscarriage or malformation.

Certain radiation and a range of chemicals (mutagens) have the capacity to damage the genes which are situated in our chromosomes. The genes contain our physical inheritance, and determine how our body will be built and how it functions, including growth, cell splitting, and chemical processes in the body.

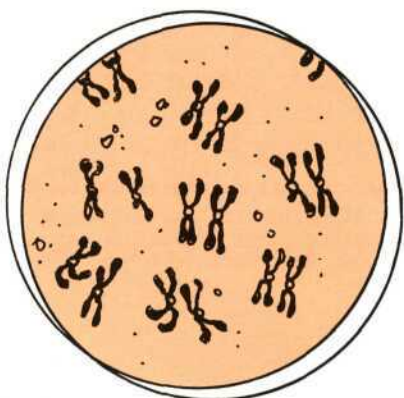
The sperm cells in the male and the egg cell in the female contain only half the amount of chromosomes compared to other cells in our body. Upon conception, the mother's and father's chromosomes are combined, giving the child half the genes from each parent.

This is why it doesn't matter which of the parents has been exposed to dangerous chemicals. There are no reasons to believe that women run a greater risk than men or, conversely, that men may be subjected to higher doses than women. It may therefore seem surprising that some countries, including Sweden and several Eastern Bloc nations, have banned women from working with mutagenic substances.



The consequences of genetic damage are of three kinds:

**Chromosome damage in the reproductive cells** usually results in rejection of the foetus, that is, miscarriage. More seldom, children are born with malformations and mental development disturbances. These children are often sterile from birth.



**Genetic damage in the reproductive cells** does not usually result in miscarriage. However, the child is often born with malformations or with metabolic disturbances.

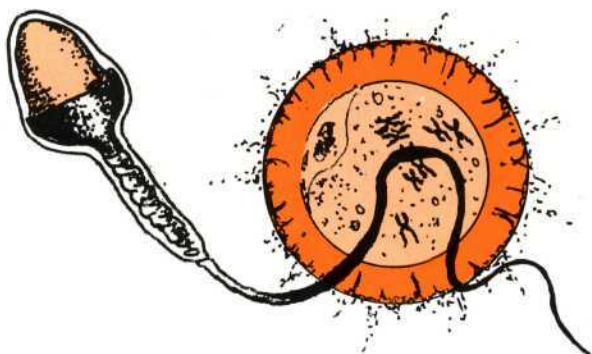
**Chromosome or genetic damage in other cells** may result in uncontrolled cell growth, that is, cancer.

**DAMAGE DURING PREGNANCY** occurs when the mother is exposed to certain chemicals (teratogens) during pregnancy. Damage to the unborn child is caused by chemicals reaching the foetus through the mother's body.

The mother's blood is shared by the baby. The protective barrier of the placenta, which surrounds the foetus, is ineffective against many foreign substances. In fact, fat soluble substances (such as organic solvents) with a low molecular weight and neutral electric charge may very easily pass on from the mother's blood to the child. The protective capacity of the placenta becomes even weaker towards the end of the pregnancy.

Substances that cannot penetrate the placenta, for instance Cadmium, may still cause foetal damage. Such substances accumulate in the placenta, inhibiting the blood flow from the mother to the child.

In addition, it should not be forgotten that even after birth, chemicals may be transferred to the baby through the mother's milk.



## THE SENSITIVITY OF THE FOETUS

During the first three months after conception, the various body organs are formed. The central nervous system begins its long development from the very start. These are extremely delicate processes. Even slight damage to the cells may cause severe malformations.

The foetus does not have the same "de-toxification" facilities as has a developed body. The unborn child is much more sensitive to toxic substances than the mother. Severe damage may occur in concentrations so low, that the mother never notices any poisoning symptoms.



There are three groups of chemicals which should be labelled as teratogenic:

**ORGANIC SOLVENTS** can easily make their way to the foetus. Both animal testing and human observation have shown damages to the unborn by organic solvents. Specific chemicals mentioned by Professor Kari Hemminki of Finland's Institute of Occupational Health include: *Acrylonitrile, methacrylate esters, styrene, carbon disulphide, chloroform, methylene chloride, toluene and xylene*. These particular substances are also mentioned in several other research papers.

**ANAESTHETIC GAS** has been observed to cause foetal disturbances in pregnant medical staff. It is believed that several

anaesthetics may cause damage. (*Enflurane* for instance.)

**HEAVY METALS** are known to cause damage to the unborn child. *Mercury*, *Cadmium* and *Lead* are included in this group, as well as some other metals, such as *Lithium*. In Sweden, pregnant and breast feeding women are not allowed to work with lead.

In addition, **IONISING RADIATION** has been found to cause genetic damage. The main sources of this type of radiation are X-Ray equipment and radioactive substances. If the ionising radiation causes damage to the reproductive cells in the mother or the father, malformation or miscarriage may result. If the radiation damages other body cells, cancer may ensue.

Some pesticides are also suspected of causing birth defects — and not only agricultural ones: even pesticides commonly used in Australian homes are on the high risk list. The Australian Democrats' science spokesman, Senator Coulter, has recently called for domestic insect sprays and pest strips to be banned. According to Senator Coulter, the insecticide **DICHLORVOS** has been known to be mutagenic since 1973.



(SOURCES: Hansson, Hellsten: *Arbetsmiljö från A till ÖE*, Stockholm 1982; Winiarski & Hemminki: "Your body at work", Stockholm 1987; Barry Prismall)

# ENVIRONMENTAL FACTORS INFLUENCING THE REPRODUCTIVE SYSTEM

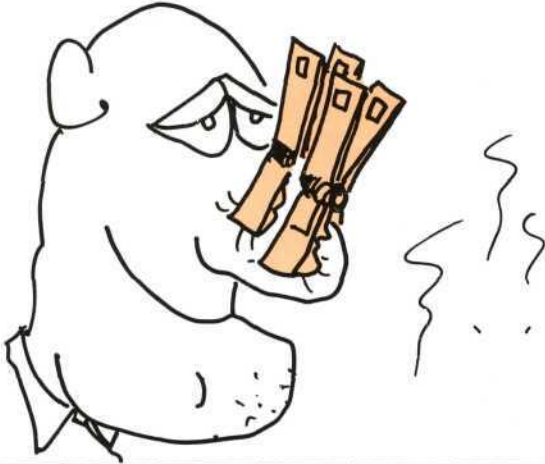
FACTOR	Reduced fertility	Miscarriage	Chromosomal damage	Malformation	Sperm damage
Anaesthetic gases	M	M & F		F	
Benzene	M		M & F		
Carbon disulphide	M	F			
Chloroprene	M	M			M
Epichlorohydrin			M & F		
Ethylene dibromide	M				
Ethylene oxide		F	M & F		
Glutaraldehyde		F			
Ionising radiation	F	F	M & F	F	
Lead	M & F	F			M
Mercury		F		F	
Organic solvents	M	F	F	F	
Vinyl chloride		M	M		

**M = Male Exposure**  
**F = Female Exposure**

(SOURCE: Finland's Institute for Occupational Health, Helsinki 1982)

## Handy hints

Farmers — don't trust your noses! Toxic, explosive and suffocating gases are formed in liquid manure. The greatest hazard is that the gases weaken your sense of smell: the concentration of hydrogen sulphide may rise to lethal levels without your noticing it!



## Handy hints

Compared to light work, you inhale SIX TIMES MORE chemicals when you're working strenuously. Can your breathing gear cope? Make sure you select the right gear to suit your exertion level.



## PESTICIDE USE IN AMERICA

### becoming more stringent

As an illustration of the importance the US authorities place on the safe use of pesticides, consider the following extracts from a proposal for new legislation regarding a new Farmworker's Protection Rule:

**People concerned:** Owners, lessees, operators and their contractors, workers and supervisors.

**Areas concerned:** Farms, parks, forests, nurseries and greenhouses.

#### Measures to be taken:

**Training:** All handlers, including not only applicators, but also mixers, loaders, disposers, and cleaners of pesticides, must be trained by certified people.

**Information:** Information must be given in four ways: orally, by field posters, through a central notice board and, finally, information on request. Oral warnings must be given DAILY to all workers. Regular voice contact must be maintained with any person handling chemicals. In the case of fumigants, visual contact must be maintained. The central notice board should inform workers of emergency medical procedures, and carry a training placard (in First Aid). Every worker must know the name, address and telephone number of the nearest medical facility. The employer must be able to provide emergency transport at all times.

**Monitoring:** Any worker who is handling organophosphate pesticides for three consecutive days, or for six days in any three weeks, must be monitored for cholinesterase by a recognised physician. Records should be kept for two years.

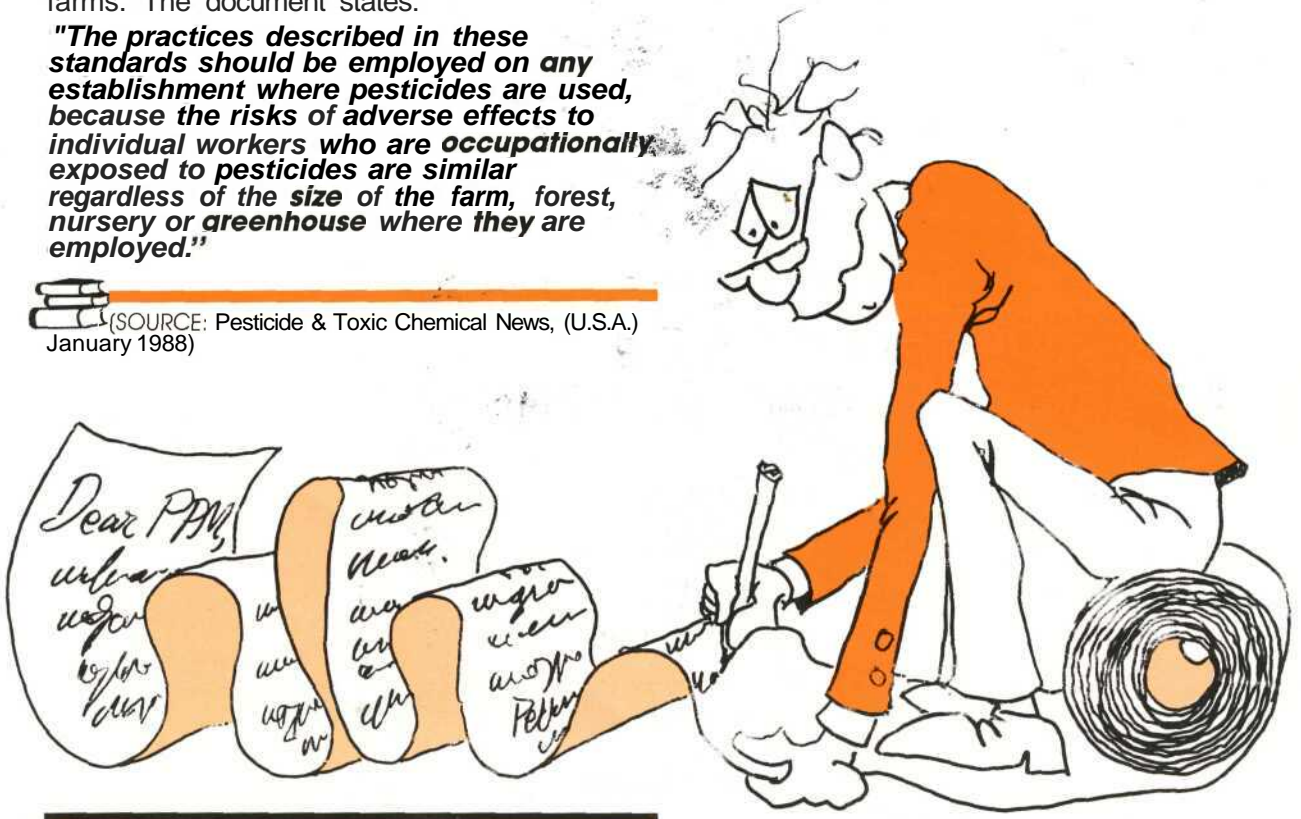
**Decontamination:** Water, towels and soap must be available before eating, drinking, smoking, or going to the toilet. Eye wash equipment should be at hand. If the product label specifies that eye goggles or visor should be worn, the eye wash dispenser must be portable, either attached to the vehicle or carried on the person. Personal protection equipment must be provided.

N.B. These are only portions of the new proposed legislation. The final law will include many additional requirements. It will also allow the various states to amend the legislation slightly. However, there will be no leniency toward small operators or family farms. The document states:

***"The practices described in these standards should be employed on any establishment where pesticides are used, because the risks of adverse effects to individual workers who are occupationally exposed to pesticides are similar regardless of the size of the farm, forest, nursery or greenhouse where they are employed."***

 (SOURCE: Pesticide & Toxic Chemical News, (U.S.A.) January 1988)

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