

Glutaraldehyde in NSW Public Health Care Facilities (Policy and Guidelines for Safe Use of)

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Summary Policy to assist public health care facilities to minimise the risks associated with occupational exposure to glutaraldehyde and meet legislative requirements.

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Applies to Area Health Services/Chief Executive Governed Statutory Health Corporation, Board Governed Statutory Health Corporations, Affiliated Health Organisations, Dental Schools and Clinics, Divisions of General Practice, NSW Dept of Health, Public Health Units, Public Hospitals

Distributed to Public Health System, Dental Schools and Clinics, Divisions of General Practice, Health Associations Unions, Health Professional Associations and Related Organisations, NSW Department of Health, Public Health Units, Public Hospitals

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POLICY AND GUIDELINES FOR THE SAFE USE OF GLUTARALDEHYDE IN NSW PUBLIC HEALTH CARE FACILITIES.

This circular replaces circular numbers 93/36 and 93/99.

Attached is a copy of the NSW Health Department's *Policy and Guidelines for the Safe Use of Glutaraldehyde in NSW Public Health Care Facilities*.

Safe handling guidelines for the use glutaraldehyde were first published by the Department in 1993. Glutaraldehyde has since been classified as a hazardous substance in accordance with the National Occupational Health and Safety Commission (NOHSC) *Approved Criteria for Classifying Hazardous Substances*. NOHSC also reduced the recommended Exposure Standard for Glutaraldehyde.

The use of glutaraldehyde is also covered by the *NSW Occupational Health and Safety (Hazardous Substances) Regulation*, gazetted in 1996. Health care facilities are required to comply with the provisions of this Regulation by July 1998.

The revised policy and guidelines are to assist public health care facilities to minimise the risks associated with occupational exposure to glutaraldehyde, and to meet the related legislative requirements. The document should be read in association with the *NSW Code of Practice for control of workplace hazardous substances*.

In particular, the policy and guidelines should be brought to the attention of radiology, medical imaging and ultrasound units, gastroenterology and endoscopy units, operating theatres, anatomical pathology, engineering and maintenance departments, out-patient clinics and day surgery units.

Occupational health and safety staff, staff involved in infection control, and any other departments that are required to use substances containing glutaraldehyde should also be made aware of the requirements of the document.

Michael Reid
Director-General

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NSW HEALTH

POLICY AND GUIDELINES

FOR THE SAFE USE OF

GLUTARALDEHYDE IN NSW PUBLIC

HEALTH CARE FACILITIES

Circular Number 97/61

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NSW HEALTH DEPARTMENT

POLICY AND GUIDELINES FOR THE SAFE USE OF

GLUTARALDEHYDE IN HEALTH CARE FACILITIES

6.1.1 Introduction

Substances containing glutaraldehyde are used extensively in the health care industry for:

- disinfecting reusable heat-vulnerable medical equipment, especially that which contains fibre-optic components;
- in the developing solution in X-ray film processing; and
- as a fixative in electron microscopy.

Glutaraldehyde is a hazardous substance and adverse health effects such as irritation and sensitisation can occur in some people. Safe work practices and protective measures are essential to protect the health of staff using this substance

6.1.2 Background

In response to the health problems glutaraldehyde exposure may cause, the NSW Health Department established a working party in 1992 to develop guidelines for the safe use of glutaraldehyde.

The guidelines developed by the working party for safe use of glutaraldehyde in health care establishments in NSW were published in 1993. Since then, glutaraldehyde has been assessed as a priority existing chemical under NICNAS and classified as a hazardous substance in accordance with the National Occupational Health and Safety Commission (NOHSC) *Approved Criteria for Classifying Hazardous Substances*. Also, NOHSC has revised downwards the Exposure Standard for Glutaraldehyde, and the NSW Occupational Health and Safety (Hazardous Substances) Regulation 1996 has been gazetted.

The Department accordingly saw the need to review the guidelines to ensure they reflected these changes and the experience of three years of their operation in the workplace.

A new Working Party was convened in June 1996 for this purpose with the following members:

- Sandy Berenger - Infection Control - Hunter Area Health Service
- Trish Butrej - OH&S Officer - New South Wales Nurses' Association
- Frank Carbon - Radiography - Royal Prince Alfred Hospital
- Linden Gotch - Gastroenterology - St George Hospital

- Helen Kasbarian - Workers' Compensation Officer - Health & Research Employees' Association
- John Kruit - Radiography - Manly Hospital
- Ric Morgan - Occupational Hygiene - Noel Arnold & Associates
- Mary Yaager - OHS&R Officer - Labor Council of NSW
- Chris Pickering - Sedgwick Risk Services (Co-ordinator)

Input to the revised Guidelines was also provided by Bob Graf (Worksafe); Dr Bob Kenyon and Gary Rhyder (WorkCover NSW); and Tony Patterson and Russell Thurling (Department of Public Works and Services).

6.1.3 Aim and Scope

The revised guidelines have been structured to assist health care facilities in complying with the *NSW Occupational Health and Safety (Hazardous Substances) Regulation, 1996* and should be read in conjunction with the *NSW Code of practice for the control of workplace hazardous substances*. They are intended to provide general occupational health and safety advice on the use (which includes handling, storage, transport and disposal) of glutaraldehyde and a framework within which managers of health care facilities can develop strategies to control the risk and prevent unnecessary and excessive exposure of their employees.

This document is not intended to cover the medical consequences to patients of the use of glutaraldehyde as a disinfectant. Relevant information can be found in TGA 54 (as amended) (see section 10) and the current NSW Health Department policies, guidelines and regulations on disinfection, sterilisation and infection control.

The guidelines should be brought to the attention of

- OH&S Officers/Risk Management Units
- OH&S Committees
- Radiology/Medical Imaging/Ultrasound Units
- Gastroenterology/Endoscopy Units
- Operating Theatres
- Anatomical Pathology
- Engineering/Maintenance Departments
- Out-patients Clinics
- Free-standing Day Surgery/Endoscopy Units

and any other departments which must use substances containing glutaraldehyde.

A dictionary is provided at Appendix 1.

6.1.4 NSW Department of Health Policy Statement

Employees and other persons must be protected from adverse health effects arising from exposure to glutaraldehyde.

Each health care facility in which employees may be exposed to the effects glutaraldehyde shall develop and implement systems and procedures to minimise exposures by all routes and ensure that no employee or other person is exposed to more than 0.1 parts per million (peak limitation) vapour concentration in air (the current Worksafe Exposure Standard).

In developing these systems and procedures, health care facilities are required to:

- *ensure timely, relevant consultation with appropriate staff (including OH&S Committees);*
- *include strategies to prevent exposures in the design stages of both the environment in which glutaraldehyde is used, the work practices associated with its use and the purchase of equipment;*
- *identify all tasks in which glutaraldehyde is utilised and assess the risks;*
- *document assessments, air monitoring, health surveillance and training,*
- *implement control measures according to the hierarchy of controls;*
- *provide relevant information and training for managers, supervisors and staff involved in the handling, use and disposal of glutaraldehyde; and*
- *ensure ongoing monitoring and review of these systems and procedures to ensure their continuing relevance and validity.*

Health care facilities must comply with the provisions of the Hazardous Substances Regulation, and implement this Policy and Guidelines as soon as practicable and, in any event, by 12 July 1998.

6.1.5 Health Effects of Exposure to Glutaraldehyde

Glutaraldehyde is a strong irritant to the skin, eyes and respiratory system, as well as being a skin sensitiser. Adverse health effects experienced by employees exposed to glutaraldehyde include:

- irritation of the nose, eyes and throat;
- general tightness of the chest;
- dermatitis (skin inflammation, rashes);
- occupational asthma;
- rhinitis (inflammation of the nose and its mucous membranes);

- headaches.

Dermatitis may be the result of either irritation, or, sensitisation. Sensitised persons may develop dermatitis even after brief exposure to low-strength solutions.

The causal mechanism of occupational asthma associated with glutaraldehyde has not been established, hence it is not clear whether it is caused by irritant effects or by sensitisation. As a consequence, glutaraldehyde is not currently classified as a respiratory sensitiser.

Repeated exposure to glutaraldehyde may cause exacerbation of skin and respiratory irritant effects. Glutaraldehyde may also aggravate common pre-existing respiratory and skin diseases, e.g. atopic eczema, asthma and chronic obstructive airways disease.

Employees should therefore be protected from exposure as far as possible.

6.1.6 Responsibilities of Health Care Facilities

The responsibilities set out below are consistent with Part 3 of the Hazardous Substances Regulation 1996 (the Regulation) and are in addition to the general duty of care imposed on employers by section 15 of the **OH&S Act** including the provision of such information, instruction, training and supervision as may be necessary to discharge that duty of care.

6.1.6.1 Information

6.1.6.1.1 Material Safety Data Sheets (MSDS)

MSDS must be obtained before or on the first occasion that glutaraldehyde is supplied and if a different product is purchased or the product is changed.

MSDS for glutaraldehyde must be readily accessible at the workplace to any employee who could be exposed to the product.

MSDS must not be altered. However, an overseas MSDS may be re-formatted to conform to Australian MSDS requirements.

6.1.6.1.2 Labels

Labels complying with the Regulation must be affixed to all containers that hold glutaraldehyde. These labels must not be removed, defaced or altered.

The labels must clearly identify the container as holding glutaraldehyde and display basic health and safety information about the substance including the relevant risk and safety phrases. Glutaraldehyde soaking containers need only be labelled "Glutaraldehyde" together with any risk phrases (see Table 1) appropriate to its concentration.

A list of safety phrases suitable for use with glutaraldehyde is in the Dictionary (Appendix 1).

Table 1.1 is reproduced from Table 31 in the NICNAS report on Glutaraldehyde (see section 10 for full title of this report).

Table 1.5 has been compiled from Appendix I of the WorkCover *Code of Practice for the Labelling of Workplace Hazardous Substances*.

Table 1.1 - Classifications for glutaraldehyde at various concentrations

Glutaraldehyde Classification	Concentration	Mixture Classification	Risk Phrase
Corrosive	>25%	Corrosive	R34
	> 1 -25%	Skin Irritant	R38
Serious Eye Damage	>5%	Serious Eye Damage	R41
	>0. 1-5%	Eye Irritant	R36
Respiratory Irritant	. 1%	Respiratory Irritant	R37
Skin Sensitiser	. 1%	Skin Sensitiser	R43
Toxic (Inhalation)	>25%	Toxic	R23
	1-25%	Harmful	R20
Harmful (Skin)	. 25%	Harmful	R25
Toxic (Oral)	. 50%	Toxic	R25
	5- <50%	Harmful	R22

Table 1.2 - Key to Risk Phrases

R34	Causes burns.	R23	Toxic by inhalation.
R38	Irritating to skin.	R20	Harmful by inhalation.
R41	Risk of serious damage to eyes.	R21	Harmful in contact with skin.
R36	Irritating to eyes.	R25	Toxic if swallowed.
R37	Irritating to respiratory system.	R22	Harmful if swallowed.
R43	May cause sensitisation by skin contact.		

6.1.6.1.3 Hazardous Substances Register

Glutaraldehyde must be listed in the hazardous substances register required by the Regulation. Where it is used in more than one concentration, each application must be listed. The MSDS for each product must be included in the register.

Hazardous substances registers must be readily available to all employees who may be exposed to hazardous substances while at their place of work.

6.1.6.1.4 Other Relevant Information

Other relevant information, e.g. the presence of glutaraldehyde in pipework, sumps or dilution tanks must be notified to anyone who could be exposed to the substance. Pipes should be labelled and access points to other systems should display an appropriately worded warning.

Further information about glutaraldehyde can be found in the NICNAS Summary Report for the assessment of glutaraldehyde as a priority existing chemical (Chemical Gazette No C6, 7 June 1994).

6.1.6.2 Consultation

The facility must consult with employees who are likely to be exposed to risk from using glutaraldehyde, and with employee representatives, about:

- hazard identification, risk assessment, risk control, risk monitoring, training and provision of information; and
- any proposed changes to the systems of work involving glutaraldehyde that may affect health and safety.

6.1.6.3 Risk Assessment

A risk assessment must be undertaken by a competent person, i.e. one who has sufficient knowledge and skills to evaluate the health risks to employees arising from the use of glutaraldehyde. This assessment must be undertaken as part of the implementation of these Guidelines and:

- identify all areas where glutaraldehyde is used; and
- for every area identified, ensure that a suitable and sufficient assessment is made of the risks to health created by the use of glutaraldehyde.

The risk assessment must be documented and contain sufficient information to substantiate the conclusions reached. It should identify all factors contributing to any health risks.

Table 2 - Contents of a risk assessment report

Risk assessment reports should include:

- the name and position of the person carrying out the assessment;
- the date of the assessment;
- the location and task(s) to which it relates;
- the name of the substance(s) containing glutaraldehyde (if applicable);
- consideration of the work environment and procedures;
- a description of existing controls including emergency measures;
- the results of consultation with exposed staff;
- a review of the information contained on the containers in which the substance is supplied, the relevant MSDS and any other information about glutaraldehyde that is available (e.g. these guidelines and the NICNAS Glutaraldehyde F, till Public Report, available (e.g. these guidelines and the NICNAS *Glutaraldehyde Full Public Report*, Australian Government Publishing Service, July 1994);
- identification of any risks to health created by the use of glutaraldehyde including a consideration of any relevant complaints by employees, incident reports and workers' compensation claims;
- results of monitoring of airborne glutaraldehyde (if any);
- a conclusion about the level of risk based on how people may be exposed, the level of exposure, the adequacy of control measures, and history of incidents;
- recommendations including any need for monitoring and/or health surveillance.

The assessment may relate to more than one work area or place of work where the particular circumstances of these workplaces are essentially the same and the degree of risk is comparable, e.g. soaking endoscopes at more than one location where equipment, procedures, work load and layout are the same.

If, after the assessment, the conclusion is drawn that there is no risk to health, an appropriate notation must be made in the Hazardous Substances Register to indicate that an assessment has been made.

If a risk to health is identified, the facility must:

- implement control measures;
- institute monitoring;
- provide information and induction and on-going training; and
- undertake health surveillance.

The report(s) of the glutaraldehyde risk assessment(s) must be readily accessible to any employee or other person at the workplace who could be exposed to the substance.

Table 3 - Circumstances under which a risk assessment must be revised

<p>Risk assessments must be revised:</p> <ul style="list-style-type: none">• if there is reason to believe that its findings are no longer valid;• if health surveillance or air monitoring results reveals the need for preventive or corrective action;• should significant change in the work practices or equipment to which it relates occur; or• if five years have elapsed since the last assessment or subsequent revision.
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Based on the findings of the assessment, certain control measures may be required. Such controls should be implemented following the hierarchy of controls (see section 6.1.6.4.1).

6.1.6.4 Controls

The controls put in place should prevent exposure to glutaraldehyde or, if that is not practicable, ensure that exposure is adequately controlled so as to minimise the risks to health it creates. Since glutaraldehyde is a strong irritant, an established skin sensitiser and a suspect respiratory sensitiser, exposure of employees to glutaraldehyde should be prevented or kept to an absolute minimum.

Table 4 - Principles for managing the use of glutaraldehyde.

The following principles should be followed in the use of glutaraldehyde.

- It should only be used where no safer, suitable, alternative substance approved by the Department is available for the purpose.
- Any non-essential uses of the substance should be eliminated.
- Glutaraldehyde processes should be isolated from general work areas to minimise the number of persons exposed.
- Exposure control measures must reflect the degree of risk determined by the risk assessment (see section 6.1.6.3).
- The control measures selected should ensure that the exposure standard is not exceeded.
- The control measures put in place should follow the accepted hierarchy of controls (see section 6.1.6.4.1) which puts the provision of personal protective equipment (other than mandatory protective clothing) as a last option and places emphasis on elimination, substitution by a less hazardous substance and engineering controls to prevent or minimise exposure.
- An alternative control strategy must be in place to manage failure of the primary control system or an emergency such as a major spill.
- All control measures including ventilation, safe work practices and personal protective equipment must be properly maintained and correctly used.

6.1.6.4.1 Hierarchy of Controls

The Hazardous Substances Regulation requires exposure to hazardous substances such as glutaraldehyde to be controlled. The Code of Practice that accompanies the Regulation sets out how the various levels of the hierarchy may be applied.

The hierarchy of control measures is a list of measures in priority order, that can be used to eliminate or minimise exposure to hazardous substances. The hierarchy of control measures and the sequence in which they should be implemented is given below, with examples where possible.

Unless glutaraldehyde can be eliminated or substituted, adequate ventilation is an essential part of any glutaraldehyde management strategy (Appendix B).

Elimination

- Control of a hazard by elimination includes use of an alternative process that does not involve utilising a hazardous substance.
- Current technology does not allow this option for all uses of glutaraldehyde in health care facilities.

Substitution

- Control of a hazard by substitution involves change to a less harmful substance or the same substance but in a less harmful form. (Note that if the substitute is classified as a hazardous substance, then a risk assessment will have to be carried out.)
- In relation to high level disinfection, any alternative substance would have to be approved by Department of Health Infection Control Policies.

Isolation

- Control of a hazard by isolation involves complete separation of the process from the employee.
- For glutaraldehyde used in high level disinfection, this could mean an automated disinfecting machine for scopes and, for medical imaging, automatic film processors, both of which remove or at least keep to a minimum the need for employees to come in contact with glutaraldehyde or its vapours.

Engineering Controls

Unless glutaraldehyde can be eliminated or substituted, adequate ventilation is an essential part of any glutaraldehyde management strategy (Appendix B).

- Control of a hazard by engineering means entails plant or processes that either minimise the generation of the substance or limit or contain its spread.
- Extraction ventilation, closed systems for filling and emptying glutaraldehyde containers, as well as fume cupboards and re-design of work-stations are examples of engineering controls.

Safe Work Practices

Safe work practices do not actually control hazards at their source but instead entail certain administrative practices which lessen exposure and therefore lower risks. Safe work practices should include:

- storing glutaraldehyde in secure and properly marked locations away from sources of heat;
- keeping glutaraldehyde containers covered or sealed;
- ensuring processes involving glutaraldehyde are only conducted in areas set aside for its use;
- keeping the number of staff involved to a minimum;
- restricting access to areas where glutaraldehyde is used;
- ensuring regular inspection and maintenance of equipment;
- scrupulously following the safe work procedures developed for its use, including wearing personal protective equipment;
- rotating employees through areas to reduce frequency of exposure;
- limiting exposure time/occasions when exposed;
- disposing of glutaraldehyde solutions and containers in a manner which minimises exposure to workers and the environment (see Appendices C and D).

6.1.6.5 Airborne Concentration - Exposure Levels

The current occupational exposure standard for glutaraldehyde in Australia is 0.1 parts per million, (peak limitation) with a sensitiser notation. A full explanation of exposure standards is contained in *Exposure Standards for Atmospheric Contaminants in the Occupational Environment*, as amended from time to time by Worksafe, and available from Australian Government Publishing Service bookshops.

Accordingly, as stated in the Department's Policy (Section 4), no employees or other persons at the workplace are to be exposed to an airborne concentration of glutaraldehyde vapour in their breathing zones of more than 0.1 parts per million (peak limitation).

6.1.6.6 Atmospheric Monitoring

There are several different methods available for monitoring glutaraldehyde vapour levels. Most of these monitoring methods are expensive and complicated and all require considerable expertise. The simpler hand-held meter may be subject to interference from other chemicals.

Consequently, it is recommended that chemical vapour sampling and monitoring should only be undertaken by a person with appropriate training, e.g. an occupational hygienist using validated methods.

Monitoring should take place during peak workload periods as follows:

- as part of commissioning of a new facility or item of equipment;
- initially to determine glutaraldehyde exposure levels as a part of the risk assessment;
- routinely and at least annually to determine compliance with exposure standards;
- after a non-compliant air monitoring result as soon as corrective action has been taken;
- in response to employer or employee concerns or reports of adverse health effects;
- after equipment changes or work practices have been revised; and
- if directed by a WorkCover NSW inspector.

Monitoring should take place after consultation with staff to ensure that air sampling takes place in all areas where potential exposure might occur and in the peak work load situation.

Table 5 - Contents of a monitoring report

Monitoring reports should contain the following information:

- the location, date and time of sampling;
- who performed the sampling;
- the reason for the sampling (initial, routine or in response to a complaint);
- the conditions under which sampling occurred;
- any comments and/or reports of adverse health effects or staff complaints;
- the monitoring methodology;
- the results;
- an interpretation of the results including a comparison with the exposure standard; and
- recommendations for any corrective actions required, including health surveillance and further monitoring.

Where a risk assessment indicates that atmospheric monitoring should be undertaken, the employer must:

- arrange for monitoring to be conducted and results recorded; and
- ensure that any employee or other person at the workplace who may be or may have been exposed to glutaraldehyde is provided with the results of the monitoring and that the monitoring records are readily accessible to them.

6.1.6.7 Training

Training is a requirement under the **OHS Act** and the Hazardous Substances Regulation. Information and resources may be obtained from WorkCover NSW, Worksafe Australia and suppliers.

6.1.6.7.1 Induction

Training must be provided before commencing duties to all employees who are likely to be exposed to glutaraldehyde at their workplace. This training must be given in a manner which is appropriate to the employee's knowledge and skill levels and take into account any language or other requirements.

6.1.6.7.2 On-going Training

Training must be provided at least annually to ensure that procedures for use are continuously and correctly followed and to provide a forum for procedural review.

6.1.6.7.3 Training Content

Table 6 - Content of Training

<p>Induction and on-going training courses should include:</p> <ul style="list-style-type: none">• potential health effects;• first aid;• where to find and how to interpret relevant information, i.e. MSDS and labels;• wearing and maintenance of personal protective equipment;• safe handling, use and disposal procedures;• use of control equipment;• environmental monitoring and health surveillance;• legislative responsibilities;• reporting of hazards, equipment and other process failures and incidents;• an outline of the identification, assessment and control process; and• emergency procedures and spill clean up.
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6.1.6.7.4 Training Records

Training records must be kept (see section 6.1.7.1).

6.1.6.8 Health Surveillance

Health care facilities should consider health surveillance of those employees exposed to glutaraldehyde where the risk assessment indicates that health problems may occur. Health surveillance should be undertaken or supervised by a WorkCover NSW-authorized medical practitioner.

The following guidelines (1) are suggested:

1. Before commencement of work to obtain baseline information:
 - general medical history;
 - symptom questionnaire relevant to the possible health effects of glutaraldehyde exposure, e.g. dermatological and respiratory history and symptoms;
 - spirometry (2).
2. Routinely:
 - symptom questionnaire (at least annually);
 - spirometry (every two years). (See note 2.)
3. If symptoms are reported or identified by routine surveillance:
 - evaluation by a suitably briefed and qualified physician;
 - spirometry (where respiratory symptoms indicate). (See note 2.)

Note 1: These are suggested measurement tools only and are not specific to glutaraldehyde exposure. For example, other factors may also affect lung function.

Note 2: Routine or surveillance spirometry should always be conducted immediately at the end of the work-shift.

Any health care workers with diagnosed sensitisation or exacerbation of existing medical conditions should be transferred to work which does not involve potential exposure to glutaraldehyde in accordance with anti-discrimination policies and legislation.

Any incidence of sensitisation or other reported symptoms should be regarded as a potential non-conformance with OH&S legislation and the Department's policy for glutaraldehyde and these guidelines and should be investigated accordingly. The risk assessment and control measures for the work area/process in which the symptoms originated should be formally revised.

6.1.6.8.1 Notification of Results

As soon as practicable after undergoing health surveillance, the employee should receive notification of the results from the medical practitioner who should also give any additional explanation that may be necessary. The medical practitioner must also notify:

- the health care facility of the general outcome of the surveillance and advise any actions of a preventive or remedial nature that the surveillance may indicate; and
- WorkCover NSW, if any adverse results consistent with exposure to glutaraldehyde were detected.

See section 6.1.7.1 regarding confidentiality of medical records.

6.1.7 Record Keeping

The Regulation requires health care facilities to keep extensive records associated with the use of hazardous substances. Medical practitioners involved in health surveillance are also required to keep records.

6.1.7.1 Health Care Facilities

The facility must keep records, in suitable form, of all:

- assessment reports which indicate a need for monitoring or health surveillance and the results of any monitoring and surveillance, for at least 30 years from the date of last entry;
- assessment reports which do not indicate a need for monitoring or health surveillance, for at least 5 years from the date of last entry; and
- records of induction and on-going training, for at least 5 years from the date of their creation.

The results of any health surveillance provided by a medical practitioner or otherwise obtained must be kept confidential.

Should the health care facility close down, those reports which indicate a need for monitoring or health surveillance and the results of monitoring and health surveillance must be offered to WorkCover NSW.

6.1.7.2 Records to Be Made Available

The facility must ensure that, on request by WorkCover NSW or any emergency service, all relevant records on glutaraldehyde required by the Hazardous Substances Regulation, which are kept at the workplace, are made available.

6.1.7.3 Medical Practitioners

The medical practitioner is responsible for the storage and use of medical records. In particular, the medical practitioner must ensure that:

- medical records arising from health surveillance of employees are retained as confidential records, kept separate from other treatment records for that person, and identified as being for the purpose of health surveillance under the Hazardous Substances Regulation;
- the informed consent of employees is obtained, in writing, before health surveillance records that identify them are provided to any person who is not bound to observe the principles of professional confidentiality; and
- if ceasing practice in New South Wales, the records are offered to WorkCover NSW.

6.1.8 Responsibilities of Health Care Workers

Employees have duties under the **OH&S Act** and the Hazardous Substances Regulation. In summary these require employees:

- to co-operate with the facility's efforts to provide a safe and healthy workplace;
- to follow safe work practices, attend training and co-operate in the conduct of risk assessments;
- to co-operate in the performance of monitoring and health surveillance;
- not to interfere with or misuse anything provided in the interests of health and safety;
- to report promptly to their supervisors any matter that they become aware of that will affect the facility's ability to provide work practices and systems of work for the use, handling and storage of glutaraldehyde that are safe and without risk to health.

6.1.9 Emergency Procedures

Health care facilities should have emergency plans in place and train and practise employees in these procedures to ensure prompt response to emergencies involving exposure to glutaraldehyde, e.g. spillages and equipment failures.

In particular, the procedures must cover all areas where exposure to glutaraldehyde might occur (including e.g. store-rooms) and:

- define protective clothing to be worn;
- include a spill clean-up kit with means of containment and neutralising agents, such as sodium bisulphite, commensurate with the maximum likely spill scenario;
- ensure appropriate first aid facilities are available;
- define the procedures for evacuation of non-involved persons from the area; and

- outline reporting requirements.

6.1.9.1 Eye and Skin Contact

The following precautions and procedures should be followed in the event of contact with glutaraldehyde. First aid instructions may also be found in the substance's MSDS.

- Eyes should be immediately flushed with 1 litre of normal saline via an intravenous fluids giving set, or with ordinary tap water for at least 15 minutes if saline is not immediately available, before further treatment by a medical officer.
- Accidental skin contacts must be dealt with immediately by washing thoroughly.
- Any contaminated clothing should be removed as soon as possible and laundered before further use.

6.1.9.2 Spill Clean-up

The size and location of the spillage will usually dictate the precautions that should be taken. Some spills though apparently minor in size may require the same precautions as major spills, due to factors such as fume generation.

The procedures and precautions to be taken when cleaning up major spills should be determined by reference to the MSDS. Neutralising agents should be used when appropriate.

Minor spills may normally be wiped up with disposable cloths or towels which should then be discarded in a sealed plastic bag as contaminated waste or laundered according to the healthcare facility's policy. Appropriate protective clothing as described in Appendix G should be worn and decontaminated after use.

Note: Whilst speed is important in cleaning up spills of glutaraldehyde, it must not be at the expense of health and safety.

6.1.10 Sources of Further Information

Further advice and information can be obtained from the suppliers and manufacturers of glutaraldehyde compounds and related equipment, or from the Occupational Hygienist, Chemical Hygiene Section, Chemical Safety Unit, WorkCover NSW (phone (02) 9370-5147).

References

NSW Health Department, *Infection Control Policy*, Circular 95/13, AIDS/Infectious Diseases Branch, 30 June 1995

NSW Health Department, *Low temperature sterilisation*, Circular 96/36, 27 May 1996

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Therapeutic Goods Administration, Therapeutic Goods order No 54, and amendments, *Standard for composition, packaging, labelling and performance of disinfectants and sterilants*, Department of Health and Family Services, Canberra, October 1996.

Susan LP Jordan, Mario F Stowers, Earl G Trawick and Alan B Theis, (April 1996), Glutaraldehyde Permeation, Choosing the proper glove, *American Journal of Infection Control*, 24 (2); 67-69.

Australian Confederation of Operating Room Nurses, *Use of Glutaraldehyde in Operating Rooms*, Standards, Guidelines and Policy Statements, (May 1995).

Note: References specific to Infection Control are listed in Appendix F and Australian Standards for personal protective clothing are listed in Appendix G at appropriate locations in the text.

SAMPLE CHECKLISTS FOR THE SAFE USE OF GLUTARALDEHYDE

The checklist which follows has been adapted from that provided in the WorkCover NSW booklet "A guide to the Hazardous Substances Regulation and Control code of practice".

Whilst some effort has been devoted to making it relevant to the safe use of glutaraldehyde, it is not claimed to be complete. Health care facilities are invited to add extra issues to suit their particular requirements.

Also reproduced with the kind permission of WorkCover NSW is a pro-forma for a Hazardous Substances Risk Control Plan which has been extracted from their OH&S Workplace Substances training course

Glutaraldehyde Checklist

Q	ISSUE	COMMENT
1	Are all containers of glutaraldehyde adequately labelled?	
2	Are current MSDS for all glutaraldehyde products in use in the facility readily available to employees?	
3	Are all glutaraldehyde products included in the hazardous substances register?	
4	Is there an adequate system to ensure only authorised persons may obtain and use glutaraldehyde?	
5	Have written procedures been developed for the safe use of glutaraldehyde in every situation?	
6	Are the procedures (Q5) readily available to employees?	
7	Is there a register of all work areas where glutaraldehyde is in use?	
8	Have risk assessments been carried out on all the processes involving the use of glutaraldehyde?	
9	Has workplace monitoring been recommended? If 'Yes' has it been arranged/conducted by a competent person?	
10	Have all control measures arising from the risk assessment been installed?	

Q	ISSUE	COMMENT
11	Have all other recommendations of the risk assessment reports been implemented?	
12	Have all employees whose work exposes them to glutaraldehyde been identified?	
13	Have all employees received appropriate induction training before starting work using glutaraldehyde?	
14	Is annual refresher training provided to employees who work using glutaraldehyde?	
15	Have all involved employees received the training (Q 14)?	
16	Are records kept of training given to employees whose work exposes them to glutaraldehyde?	
17	Did the risk assessment recommend health surveillance? If 'Yes' has it been arranged/conducted by a WorkCover authorised medical practitioner?	
18	Is glutaraldehyde stored in secure and appropriately marked locations away from heat sources?	
19	Are correct procedures for using glutaraldehyde followed?	
20	Are correct procedures followed for disposing of waste glutaraldehyde and empty glutaraldehyde containers?	
21	Have procedures to manage emergencies involving glutaraldehyde been developed?	
22	Have appropriate employees been trained in emergency procedures and emergency drills conducted?	
23	Are spill clean-up kits and appropriate protective clothing readily available and checked sufficiently often?	
24	Do methods to control exposure to glutaraldehyde follow the hierarchy of controls?	
25	Are inspection and maintenance programs for ventilation and other equipment in place?	

HAZARDOUS SUBSTANCES

Risk Control Plan

Location/Work area: _____

Job Title: _____

Job Description: _____

Hazardous substance(s): _____

COMPLETE THE RISK ASSESSMENT CHECKLIST BEFORE PROCEEDING.

Assessors:

1. _____ 2. _____ 3. _____

Position:

(_____) (_____) (_____)

Date:/...../.....

Attach assessment report

Yes No

What are requirements within the material safety data sheets? _____

Has the workplace health and safety committee been consulted?

Yes No

**Risk Control Plan
Hazardous Substances**

Risk Control Checklist:

1. Can the process be (re)designed so as to eliminate the need for the hazardous substance(s)? Is the substance necessary?

Yes No

Options

2. Can the hazardous substance be substituted for a safer product?

Yes No

Options

3. Can the substance be isolated from the work area?

Yes No

Options

4. Can the work area be adequately ventilated?

Yes No

Options

(see over.....)

**Risk Control Plan
Hazardous Substances**

5. Is local exhaust ventilation necessary?

Yes No

Options

6. Can general ventilation be provided?

Yes No

Options

7. Can the substance be dispensed in a safer way?

Yes No

Options

8. Is the chemical adequately stored?

Yes No

Options

9. Is there an up to date emergency plan and procedures in place?

Yes No

Options

**Risk Control Plan
Hazardous Substances**

10. Are first-aid facilities adequate for the hazardous substance?

Yes No

Any special procedures?

Yes No

Options

11. Is training provided?

Yes No

Options

12. Is personal protective equipment necessary?

Yes No

Options

Respirators

Gloves

Faceshields, etc

Other

13. Is the PPE designed to provide adequate protection against the hazards at your workplace?

Yes No

Options

**Risk Control Plan
Hazardous Substances**

14. Have you checked that the PPE comfortably fits all workers who have to wear it and that it is always worn by people at risk?

Yes No

Options

15. Have provisions been made for the cleaning and maintenance of the PPE?

Yes No

Options

16. Are written procedures for PPE available?

Yes No

Options

Action Plan

The aim is to use the most quick/effective/economical/simple solutions.

Consideration of risk control options:

**Risk Control Plan
Hazardous Substances**

Risk Controls chosen:

Short term

Long Term

Has the workplace health and safety committee been consulted?

Yes

No

Action Plan:

hazardous substance	priority number	control(s) to be used	personnel responsible	due date	date done

Evaluation of Controls:

Date:

VENTILATION**General**

Mechanical exhaust ventilation designed to draw vapours away from the operator and exhaust them to outside air is the most reliable method of removing glutaraldehyde vapours from the workplace. It is essential that the capacity of the ventilation system is consistent with the scale and scope of the operation it must service, and that the characteristics of the air flows in the environment in which it operates are taken into account.

Any ventilation systems should be designed and installed by air conditioning engineers experienced in extraction ventilation systems to ensure that an appropriate specification is used and that the operations of the extraction systems do not interfere with the other ventilation systems. For effective vapour control, the following general rules should be observed.

- Possible sources of glutaraldehyde vapour should be enclosed; work benches should have lips to contain spills, and sinks for rinsing and disposal of glutaraldehyde should be within the ventilated enclosure.
- A capture velocity of at least 0.5 m/s at the work opening should be ensured for systems such as fume cabinets or at the glutaraldehyde vapour source for other systems.
- Drafts should be eliminated as their turbulence will affect the performance of the extraction system. Where they cannot be eliminated, increases in capture velocity may be warranted.
- A device should be included to enable staff to monitor the performance of the enclosure, e.g., a remote pilot light linked to a pressure switch across the fan. The pilot light should be interlocked to prevent operation of the equipment until ventilation is restored.

Discharge of the exhaust of any ventilation system should be to the outside air. Care should be taken to ensure that there is no re-entrainment (where the exhausted air is drawn into another ventilation system, or that the discharge is not into an area where other people may be exposed). This will involve consideration of the location of the exhaust ventilator and local wind effects.

Any exhaust point should comply with the requirements of the Environmental Protection Authority.

Exhaust ventilation could be in the nature of a fume cabinet which meets with requirements of AS 2243.8. Such cabinets, if the preferred control option, should be installed by

professionals with experience in the field. If a fume enclosure is to be purpose-built (rather than purchased as an off-the-shelf item), it should be designed by a professional air-conditioning engineer with proven experience in the design of such equipment.

Where fume cabinets are installed, facilities must implement a program of on-going performance testing as set out in AS 2243.8.

Planned maintenance programs should be developed for all glutaraldehyde ventilation systems.

Air recirculation system with carbon filters

This type of system is only suitable for small scale or infrequent glutaraldehyde use and air recirculation systems are generally not recommended. The carbon filters used in such systems are not sufficiently effective to prevent a proportion of the vapours from returning to the work environment.

A statement from the manufacturer should be sought to determine the capability of the filtering media to remove glutaraldehyde and its estimated efficiency.

Recirculating systems should only be used if, during the course of their operation, exposure standards are not exceeded. Only cabinets which meet the requirements of AS 2243.9 should be considered. Filters should be maintained and replaced according to the manufacturer's instructions.

As with any other control measure, monitoring of air recirculation systems should take place on commissioning and at regular intervals thereafter.

Operating Theatres

Where high level disinfection is carried out in operating suites, the normal theatre dilution ventilation system is likely to be inadequate for the removal of glutaraldehyde vapours. Vapour monitoring should be performed during usage to determine if exposure standards are being exceeded.

Where exposure standards are likely to be exceeded, it is recommended that extraction ventilation systems as per this Appendix are installed. Where this is not practical, disinfection may be carried out in a location within the operating suite that meets the necessary ventilation requirements, and that is adjacent, or as close as possible to the theatre. During transfer of the disinfected instruments, appropriate infection control procedures **must** be followed.

Radiology

Within radiology departments, darkrooms and mixing rooms should be provided with a ventilation system that provides at least 15 air changes per hour. In addition to this it

is recommended that all processes that may generate glutaraldehyde vapours should be fitted with specific exhaust ventilation systems. These processes may include:

- X-ray processors;
- Automatic mixers;
- Waste Systems;
- Silver recovery systems.

When selecting new X-ray processors, facilities should ensure that they have provision for the extraction of hot air.

In the design of exhaust ventilation for radiology departments, consideration should be given to the following factors:

- the independence of the ventilation from the general air conditioning system;
- the need for continuous operation of the exhaust ventilation system when chemicals are in the area, regardless of whether the treatment system and/or the processor is in use;
- the density of the vapours especially any changes that the different temperatures may have;
- the number and location of the vapour generation points;
- the work practices involved; and
- the effects of the general air conditioning system.

Electron Microscopy

All work with glutaraldehyde within electron microscopy areas should be conducted in a fume cabinet or space where an extraction ventilation system specifically designed for that purpose has been provided.

USE OF GLUTARALDEHYDE AS A DISINFECTANT

There are different commercial products available and most of them have pigments and perfume added.

Some common brands of glutaraldehyde solutions used in hospitals in NSW are:

- 1% Solution - Aidal and Wavicide (Whiteley Industries);
- 2% Solution - Cidex (Johnson & Johnson Medical), Aidal Plus (Whiteley Industries).

Equipment

Purpose designed containers should be used for holding glutaraldehyde during the soaking procedure. The soaking containers should:

- be made from strong and durable materials and be sufficiently deep to allow instruments to be fully covered by solution;
- be only as wide as necessary for the instruments to be accommodated - the surface area of the chemical should be as small as possible;
- have tight, fully enclosed lids;
- have warning labels to alert users to the hazardous contents;
- if not fitted with a suction/venturi device, contain a drain that can be fed directly into the sewerage system to eliminate the need to tip the used contents into a sink. The suction device should be power-driven because hand-pumps prolong the exposure time.

If the soaking containers have other features such as hand pistons, hoses, and drainage outlets, it is important to ensure that there is no dead space in the system which would be a potential breeding ground for microbial growth.

Some models of soaking containers require routine replacement of filters. This procedure must be performed in locations with purpose-designed ventilation (see below). Staff must wear appropriate protective equipment during this procedure (see Appendix G).

Trolleys or bench tops used to house glutaraldehyde soaking trays should have a rim to contain spillage. Also the surface of workbenches, walls and floors in areas where the chemical is used should have impervious finishes.

Ventilation

Areas where glutaraldehyde is used must have adequate ventilation. This may require mechanical exhaust ventilation to prevent exposure of staff to hazardous vapours. This is especially critical during instrument soaking/disinfection, rinsing and chemical decanting which generate higher levels of chemical vapours.

Appendix B contains general requirements for ventilation systems and the typical set-up of such systems for disinfection work. It also describes the ventilation requirements for process work areas and occasional work areas respectively.

Safe Work Practices

The following precautions should be observed when handling glutaraldehyde:

- At all times, the manufacturer's instructions for the use of glutaraldehyde must be followed.
- All soaking, rinsing and decanting should take place within the ventilated enclosure or fume cabinet.
- Appropriate protective clothing (see Appendix G) should be worn at all times. Standards for protective clothing should not be relaxed because the work is conducted in a ventilated enclosure.
- Decanting into the soaking containers should be performed carefully to avoid splashing.
- Containers should not be overfilled.
- Instruments should be placed gently into the solution to avoid splashing.
- Soaking containers should be at a height such that the operator's forearms are in a dependent position (i.e. sloping downwards).
- Gloved hands should be rinsed under running water before positioning the lid to avoid contamination.
- The container lid should always be in place during soaking.
- Instruments should be removed gently after soaking and excess glutaraldehyde solution allowed to drip back into the tray.
- Instruments should be rinsed under running water as close as possible to the soaking tray to minimise dripping of glutaraldehyde solution onto the work bench or floor.

- In the operating theatre environment, if sterile water rinsing is required, two bowls of water should be used and the final rinse performed by holding the instrument above the bowl and pouring sterile water over it. Instrument channels should be rinsed from a separate fresh bowl of sterile water. Bowls of rinsing water should be changed between each case.
- Glutaraldehyde waste should be flushed down the sewerage system with a copious volume of water.
- Glutaraldehyde must not be disposed of into septic tanks as it may inactivate essential bacteria. In such cases, the glutaraldehyde in the waste solution should be neutralised using an appropriate neutraliser such as sodium bisulphite solution before disposal.

USE OF GLUTARALDEHYDE IN FILM PROCESSING

Darkroom Chemicals

Radiographic developers and fixers contain several types of chemicals, some of which are particularly hazardous to health. Amongst these, glutaraldehyde presents a significant health risk to the users but the health effects of the other chemicals must not be overlooked.

Material Safety Data Sheets (MSDS) provided by the suppliers of darkroom chemicals must be consulted for information on health effects of all chemical components.

Hazardous Operations in Film Processing

Not all facilities have automatic mixers, and where manual mixing methods are practised, the staff will be subjected to higher risk of glutaraldehyde exposure.

Developers and fixers used at high temperature inside the processor inevitably produce higher levels of chemical vapour during operations. If not removed, this vapour may condense within the processor and find its way into the workplace environment.

Incomplete sealing of processors, faulty heating elements, leaking hoses and joints, improperly connected extraction ports and inadequate preventive maintenance all contribute to greater risk of chemical exposure.

In establishments with outdated equipment, consideration should be given to purchasing new equipment which can help to minimise the exposure of staff to chemical vapours. In general, processors with infrared driers produce less heat and chemical vapours than the traditional hot air driers and should be the preferred equipment.

When installing processors, manufacturers' specifications must be adhered to.

Preparation of Working Solutions

Where possible, all manual mixing of darkroom chemicals should be replaced by automatic mixers fitted to film processors.

For manual mixing, appropriate personal protective equipment including respirator, elbow length gloves, splash guards and aprons must be worn (see Appendix G).

Manual mixing should be carried out in enclosures with mechanical exhaust ventilation.

Discharge of Waste Darkroom Chemicals

From an environmental point of view, the recommended method for the disposal of waste chemicals is to install dilution or holding tanks to ensure that the effluent is sufficiently diluted.

The common practice of discharging waste darkroom chemicals from the processors directly into the drainage system, although not recommended, is allowed in NSW as long as the effluent is in a diluted form and the requirements of the local authority are met.

Dark room chemicals must not be discharged into septic tank systems. Instead, the waste darkroom chemicals should be piped directly into containers sited in easily accessible but secure storage areas for removal by contractors.

Preventive Maintenance Program

A preventive maintenance program must be implemented to ensure that the processor and safety devices such as the built-in extraction fans and thermostat are functioning correctly. Hoses and joints should be inspected regularly. This will enable early detection of deterioration and allow prompt corrective action.

USE OF GLUTARALDEHYDE IN ELECTRON MICROSCOPY

Glutaraldehyde is used for the rapid primary fixation of tissue required for electron microscopy.

Solutions should be prepared in a fume cabinet, stored in airtight containers and appropriately labelled. Sample preparation (cutting up under glutaraldehyde solution, rotation and rinsing) should likewise occur in a fume cabinet. Instruments should be well rinsed after use.

Gloves, eye protection and a laboratory coat should be worn whilst the fixative solution is being prepared, during use and disposal.

Waste Disposal

Small volumes of waste may be flushed down the sink in the fume cabinet with a copious volume of water.

USE OF GLUTARALDEHYDE IN INFECTION CONTROL

Glutaraldehyde is the only chemical currently approved for disinfection (see definition in Appendix 1).

For information on infection control and the disinfection of instruments, reference should be made to:

NSW Health Department, *Infection Control Policy*, Circular 95/13, AIDS/Infectious Diseases Branch, 30 June 1995.

NSW Health Department, *Low temperature sterilisation*, Circular 96/36, 27 May 1996.

Gastroenterological Society of Australia with the Gastroenterological Nurses' Society of Australia, *Infection and Endoscopy* (3rd Edition), Sydney, 1995.

National Health & Medical Research Council, *Infection control in the health care setting: Guidelines for the prevention of transmission of infectious diseases*, Series on Infection Control, National Health & Medical Research Council, April 1996.

Standards Australia, *Code of practice for cleaning, disinfecting and sterilising reusable medical and surgical instruments and equipment, and maintenance of associated environments in health care facilities*, AS 4187-1994, Sydney.

PERSONAL PROTECTIVE EQUIPMENT

Generally, personal protective equipment should be worn as a control measure in situations which include:

- in conjunction with other control measures which cannot on their own provide sufficient risk control. This is the case with glutaraldehyde use since protection from both respiratory and skin exposure is required;
- where personal protective equipment is required to safeguard against exposure until other controls can be implemented, e.g. use of respirators until a fume cabinet/ enclosure is installed; and
- where the infrequency of use and limited number of employees involved make other control measures impractical.

Where personal protective equipment is used, the facility should ensure that it:

- is selected for the individual employee and for the task to be undertaken;
- is readily available;
- is maintained in a clean and functional condition by trained staff; and
- complies with Australian Standards, where applicable.

Health care workers using personal protective equipment should be trained in its use and understand why, how and when it is to be used.

Appropriate personal protective equipment for wear when handling glutaraldehyde will include:

- gloves (depending on the circumstances, AS 2161 *Industrial safety gloves and mittens*, AS 4179 *Single use sterile rubber surgical gloves*, AS 4011 *Examination gloves for general medical and dental use*);
- respiratory protection (AS 1715 *Selection, use and maintenance of respiratory protective devices* and AS 1716 *Respiratory protective devices*);
- aprons (AS 3765, *Clothing for protection against hazardous chemicals*); and
- eye protection (AS 1337 *Eye protection for industrial environments*).

MANDATORY PROTECTIVE CLOTHING

The following protective clothing must be worn on all occasions when using glutaraldehyde.

Gloves

Re-useable gauntlet length gloves made from nitrile or butyl rubber can provide an effective barrier against glutaraldehyde providing that the integrity of the glove is maintained. Immediately following use, the glutaraldehyde residue should be rinsed off with running water so as not to contaminate work surfaces. Following this, both hands and gloves should be washed with soapy water to remove glutaraldehyde. Gloves should be rinsed and dried to prolong the life of the glove. The gloves should be inspected for cracks and signs of leakage before re-use. Single-use gloves made of nitrile or latex avoid the problem of unrecognised permeability of gloves.

When using glutaraldehyde in the sterile environment of operating theatres, a double layer of surgical latex gloves should be used when handling instruments contaminated with glutaraldehyde. The outer layer of gloves must be removed after contact with glutaraldehyde and prior to contact with work surfaces or patients.

Other types of gloves should not be used unless guaranteed in writing by the manufacturer to provide an effective barrier against glutaraldehyde.

An article in the April 1996 American Journal of Infection Control provides additional guidance in the selection of suitable gloves for wear when using glutaraldehyde (see section 10 for the full citation of this reference).

Gowns

An impervious gown with a plastic apron, should be worn in the cleaning room to provide full body protection. The plastic apron is easily changed should a splash occur.

Face Shields

A full face shield should be worn to give adequate protection to the facial skin, the mucous membranes of the mouth and nose and additional protection for the eyes. The face shields provided must be adequate for full face protection and provide clear vision. The addition of goggles may be needed to provide eye protection where face shields afford incomplete coverage.

ADDITIONAL PROTECTIVE CLOTHING

The following protective equipment may also be required to be worn.

Respirators

Half-face or full-face respirators with organic vapour filters should be available in every department that handles glutaraldehyde, for use in emergencies or on occasions where it is anticipated there will be large amounts of vapour. They should also be worn where there is no exhaust ventilation or where exhaust ventilation is not operating at full efficiency.

After each use, the organic vapour filters should be replaced and the respirator should be washed and cleaned in accordance with the manufacturer's instructions and stored in its designated location.

On every occasion before use, the respirator should be tested for leakage in accordance with the manufacturer's recommendations.

Footwear

Appropriate footwear should be worn. Shoe covers should be worn over normal shoes whenever there is a risk of splashing from the use of glutaraldehyde.

SAFE USE OF CHEMICALS

Employees can take the following simple steps to help them to work safely with glutaraldehyde:

1. Read the label.
2. Ask for the Material Safety Data Sheet (MSDS).
3. Ask questions.
4. Store, handle and dispose of the substance as advised by the MSDS.
5. If feeling unwell, seek first aid or medical attention promptly.
6. Report any problems, hazards, incidents and equipment failure.

Reading the label should provide the employee with the substance's proper chemical name and ingredients; state any possible harmful effects and advise how to use it safely. If the label is missing or does not provide the above information, before using the substance, the employee should obtain the necessary information from the supervisor or OH&S Officer.

As a hazardous substance, containers of glutaraldehyde must have proper labels as required by the Hazardous Substances Regulation. Soaking bowls and any pipework associated with the glutaraldehyde system should also carry labels advising what is in them.

Obtaining the MSDS for glutaraldehyde will provide the employee with more information than can be contained on the label. In particular it should contain the following:

- the chemical and trade names;
- the manner in which it may be a health hazard;
- advice on safe use and handling; and
- first aid and other emergency procedures.

The facility must provide an MSDS for glutaraldehyde and, under the Regulation, everyone who is in any way involved in handling, use or disposal of the substance must be allowed to see it.

Asking questions is essential if an employee is unsure about safe handling, using or disposing of glutaraldehyde. Further information can be obtained from supervisors, OHS

officers, the product's manufacturer or WorkCover NSW. Before seeking advice, the following information should have been obtained:

- the manufacturer's name;
- the manner in which it is to be used;
- the work environment in which it is to be used; and
- the personal protective equipment which has been provided.

Handling, use and disposal of glutaraldehyde by employees must be as set out in the MSDS for the substance and local instructions and procedures. If there is any conflict between the MSDS and the practices in the workplace, this must be brought to the attention of the supervisor or OH&S Officer immediately.

First aid or medical attention must be sought immediately if an employee feels unwell or exhibits symptoms associated with exposure to glutaraldehyde when working with the substance. A copy of the MSDS should be provided to the doctor.

Note: This Appendix, much of which has been extracted from the Hazardous Substances Code of Practice, has been included to provide information to employees on the safe use of glutaraldehyde.

Facilities are encouraged to use it as a training handout and (laminated) for display adjacent to where the substance is used. Additional resources published by WorkCover NSW which may be useful as employee handouts include:

- Working safely with chemicals - Advice for workers
- Reading labels and Material Safety Data Sheets - How to find out about chemicals used at your workplace
- Glutaraldehyde - Safe use

DICTIONARY

Consultation - means the sharing of information and exchange of views between employers, employees and/or employees' representatives to provide the opportunity for employees to contribute to planning and decision making in areas of occupational health and safety concern.

Disinfection - means the inactivation of non-spore forming organisms using either thermal (heat and water) or chemical means.

Endoscope - means a medical instrument for examining the interior of hollow internal organs.

Exposure - means coming into contact, whether or not voluntarily, with glutaraldehyde in either liquid or vapour form.

Exposure standard - means an airborne concentration of a particular substance in the worker's breathing zone, exposure to which, according to current knowledge, should not cause adverse health effects nor cause undue discomfort to nearly all workers. The exposure standard may be expressed in three forms: time-weighted average (TWA); peak; or short term exposure (STEL).

Hazard - means anything that has the potential to result in harm to a person.

Hazardous substance - means a substance which is either listed in the Worksafe Australia List of Designated Substances or fits the criteria for a hazardous substance set out in the Worksafe Australia document Approved Criteria for Classifying Hazardous Substances.

Health surveillance - means the monitoring of persons to identify changes (if any) in their health due to exposure to a hazardous substance including biological monitoring but excluding monitoring of airborne contaminants.

Label - means the information on a container which identifies the substance in the container, states whether it is hazardous, and provides basic information about the safe use and handling of the substance.

Material Safety Data Sheet (MSDS) - has the meaning given to it in Clause 8 of the Occupational Health & Safety (Hazardous Substances) Regulation 1996.

Monitor - means to survey regularly all measures which are used to control hazardous substances in a workplace and includes the monitoring of atmospheric contaminants but excludes biological monitoring (see health surveillance).

NICNAS - means the National Industrial Chemicals Notification & Assessment Scheme.

NOHSC - means the National Occupational Health and Safety Commission.

Respirator - means a personal respiratory protective device which is designed to prevent the inhalation of contaminated air as described in Australian Standard 1716.

Risk phrase - in relation to a substance, means a phrase that describes the hazards of a substance as referred to in the *WorkCover NSW Code of practice for the labelling of workplace substances*.

Risk to health - means the likelihood that a substance will cause harm to health in the circumstances of use.

Safety phrase - in relation to a substance, means a phrase that describes the procedures for the safe handling or storage of the substance, or the use of personal protective equipment in conjunction with the substance, as referred to in the *WorkCover NSW Code of practice for the labelling of workplace substances*.

The table below lists safety phrases suitable for use with glutaraldehyde.

Phrase Number	Phrase
S23	Do not breathe vapour
S24	Avoid contact with skin
S25	Avoid contact with eyes
S26	In case of contact with eyes, rinse immediately with plenty of water and contact a doctor or Poisons Information Centre
S29	After contact with skin, wash immediately with plenty of water
S36	Wear protective clothing
S37	Wear suitable gloves
S38	In case of insufficient ventilation, wear suitable respiratory equipment
S39	Wear eye/face protection
S51	Use only in well-ventilated areas

Sensitiser - means a substance which may result in the development of allergic reactions in a proportion of exposed individuals.

Spirometry - means the measurement of the lung capacity.

Use - in relation to a substance means the production, handling, storage, transport or disposal of the substance.

Vapour - means particles of a substance suspended in air which may or may not be visible as a cloud or mist.

Ventilation - means a system in a room or building which supplies or extracts air by mechanical means.

WorkCover NSW - means the WorkCover Authority of NSW.

Work practices - means the methods and procedures by which a task is performed.