

Safe Use of Liquid Nitrogen Policy



Title:			
Safe Use of Liquid Nitrogen Policy			
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Executive Summary

Nitrogen is used as a cryogen in the treatment of certain skin problems and is capable of inflicting serious, permanent injury if splashed onto skin or in the eyes.

It is odourless, colourless and tasteless, and may produce asphyxia without any sensation or prior warning. Therefore, any leakage of nitrogen gas or liquid in a confined space such as a room, passenger or service lift, or vehicle must be regarded as very hazardous.

The storage, use and transportation of liquid nitrogen requires such risk assessments and implementation of appropriate control measures to reduce the risk to as low as is reasonably practicable.

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1.0 Purpose

It is the aim of NHS Lothian that all persons handling, storing or transporting liquid nitrogen are fully aware of the risks posed by its use and are not exposed to unnecessary danger.

This policy, and the associated [Safe Use of Liquid Nitrogen Operational Procedure](#), has been produced in order to meet this aim. Line managers must bring the policy and guidance to the attention of those with specific responsibilities for liquid nitrogen storage, use and transport in their work activities.

2.0 Policy statement

Liquid Nitrogen is used throughout NHS Lothian in a diverse range of workplaces and work tasks, which can create risks to staff and others. These risks include potential exposure to asphyxiation and cold burns. To assess tasks and workplace risks during the important stages of storage, use and transportation, appropriate risk assessment must be undertaken and, as a result of the assessment, the implementation of appropriate control measures to reduce the risks to as low as tolerable. This policy and associated procedure provide the direction and process to assist with making that assessment.

This policy is a requirement under the arrangements section of the NHS Lothian Health and Safety Policy.

It should be noted that under the requirements of the Control of Substances Hazards to Health Regulations 2002 (as amended) there is a need to review all the work practices where liquid nitrogen is currently used and, where ever possible, replace it with a less harmful substance. This review must also be undertaken before deciding to use liquid nitrogen in the first instance.

3.0 Scope

This policy applies to all staff who dispense, use or transport liquid nitrogen in their work activities. This policy, and associated [Safe Use of Liquid Nitrogen Operational Procedure](#), cover the safe use of liquid nitrogen at less than 0.5 bar(g). All other systems containing liquid nitrogen operating at pressure greater than 0.5 bar (g) require the application of the [Pressure Systems Safety Regulations 2000](#).

4.0 Definitions

Liquid Nitrogen: Nitrogen is an inert gas at room temperature. When stored under pressure and in its liquid form it has a boiling point of -196 degrees C. It is used as a cryogen in the treatment of certain skin problems and is capable of inflicting serious, permanent injury if splashed onto skin or in the eyes.

Dewar: A bulk container in which Liquid Nitrogen is stored on site. Typically, this will be a wheeled insulated container, containing 40 litres of Liquid Nitrogen, although other sizes may be in use.

Cryac Gun: A smaller container (typically one litre) used in clinics to dispense Liquid Nitrogen.

5.0 Implementation roles and responsibilities

The overall framework of accountability and responsibility for managers and staff on the implementation of this policy follows that laid out within the [NHS Lothian Health and Safety Policy](#).

Further details on staff responsibilities are provided below:

5.1 Service /Departmental Managers

Service/Departmental Managers in areas where staff undertake liquid nitrogen tasks/activities are responsible for ensuring that:

- staff are aware of this policy and the requirements within it
- work is carefully planned, supervised, and carried out by competent people
- appropriate risk assessments have been carried out and, where identified that a significant risk exists, a safe system of work is developed and implemented
- Risk Control Action Plans are established to implement, monitor, and review risk control measures
- all staff receive suitable information, instruction, supervision, and training in the use of liquid nitrogen, the safe systems of work, and safe use of any associated equipment
- they identify, implement, and monitor suitable arrangements for the servicing and inspection of equipment as required
- Personal Protective Equipment (PPE) is provided, fit-for-purpose, and that all staff are trained in its use.

5.2 Line Managers

Line managers must ensure that risk assessments on the tasks and work environments where liquid nitrogen is used, stored, or transported are reviewed annually (as a minimum), and immediately in the event of a change or incident which suggests that it is no longer valid, and will decide what appropriate control measures must be implemented. Control measures should include the provision of information, instruction, training, supervision, mechanical equipment, personal protective equipment, and procedures.

Managers must:

- identify the staff in their area to whom this policy applies and ensure that these identified staff have read and understood the policy and associated procedure

- assess the impact of this policy on current working practices, and have an action plan to make all necessary changes to ensure that their area complies with this policy and associated procedure
- set up and maintain systems to provide assurance that this policy is being implemented as intended in their area of responsibility.

5.3 Staff

Staff must:

- ensure they have read and understood this policy and considered what it means for them, in terms of how to carry out their duties
- complete any mandatory education or training that may be required as part of the implementation of the policy
- alter working practices in accordance with this policy and associated procedure
- inform their line manager of any limitations they may have which may prevent them working with liquid nitrogen
- ensure this policy and associated procedure, designed to minimise incidents and accidents associated with liquid nitrogen, are understood, and adhered to. If staff are in any doubt, they should discuss this with their line manager
- assist with the assessment of risks, and comply and adhere to the risk assessment findings and any safe systems of work identified
- immediately report any liquid nitrogen adverse events that may cause harm to them or others to their line manager, and record on the NHS Lothian Datix system.
- immediately inform their line manager if they suspect that the safe system of work in place is ineffective or inadequate
- ensure that they wear the appropriate PPE, as identified within any task-based risk assessment
- ensure that any information, instruction, and training in the use of liquid nitrogen is adhered to. If staff are in any doubt, they should discuss with their line manager.

6.0 Associated materials

[Safe Use of Liquid Nitrogen Procedure](#), approved by the NHS Lothian Health and Safety Committee, August 2017

[Risk Management Policy](#), approved by NHS Lothian Board, October 2018

[Risk Management Operational Procedure](#), approved by NHS Lothian Board, October 2018

[Adverse Event Management Policy](#), approved by the Policy Approval Group, June 2018

[Adverse Event Management Procedure](#), approved by the Policy Approval Group, July 2018

[NHS Lothian Health and Safety Policy](#), approved by the NHS Lothian Board, April 2021

7.0 Evidence base

The legislative framework that underpins NHS Lothian's obligation to ensure that liquid nitrogen is stored, used, and transported safely is contained within:

- [The Control of Substances Hazardous to Health Regulations 2002](#)
- [The Provision and Use of Work Equipment Regulations 1998](#)
- [The Management of Health and Safety at Work Regulations 1999](#)
- [The Manual Handling Operations Regulations 1992](#)
- [The Personal Protective Equipment at Work \(Amendment\) Regulations 2022](#)
- [European Regulation \(EC\) No 1272/2008 on classification, labelling and packaging substances and mixtures](#)
- British Compressed Gases Association's Code of Practice CP30 - "The Safe Use of Liquid Nitrogen Dewars up to 50 Litres", rev 3, 2019

8.0 Stakeholder consultation

This policy has been reviewed by the NHS Lothian Health and Safety Service and presented to the NHS Lothian Health and Safety Committee. A final draft of this policy was placed on the NHS Lothian Consultation Zone to give all NHS Lothian staff an opportunity to provide comment.

9.0 Monitoring and review

9.1 Active Monitoring

All managers of areas where liquid nitrogen is used, stored and/or transported must undertake, as a minimum, annual visits, and inspections in order to review compliance with this policy.

9.2 Reactive Monitoring

All managers must ensure that a review and investigation of any adverse event where the use, storage and/or transportation of liquid nitrogen is involved, is carried out and recorded.

All adverse events must be reported using the NHS Lothian DATIX system and investigated in line with the [NHS Lothian Adverse Event Management Policy](#) and [Adverse Event Management Procedure](#).

9.3 Review

This policy will be subject to review every 3 years, as a minimum, or before as part of the compliance monitoring programme undertaken by the NHS Lothian Health and Safety Department, or as a result of any changes in legislation and Health Facilities Scotland Technical Memorandums.