



Chief Pharmacist Responsibilities: Medical Gas Pipeline Systems (MGPS)

NHS PQAC Advice Note

Date of Issue: 25th July 2017

1. Introduction

Medical gases are medicinal products. As with all medicinal products, the governance of medical gases within a hospital is the responsibility of its Chief Pharmacist.

High level responsibility in governance in medical gases reflects the fact that they (in particularly Oxygen), are amongst the most commonly used medicinal products in the hospital environment. They are indicated in many critical conditions, and there is the potential for serious harm and even death if not administered and managed appropriately.

This has been recognised in that the misadministration of a medical gas has been on the National Health Service (NHS) never event list in England.

In its Rapid Response Report RRR006, September 2009, the National Patient Safety Agency (NPSA) had received 281 reports of serious incidents (up to June 2009) related to inappropriate administration and management of Oxygen. Of these incidents, poor oxygen management appears to have caused nine patient deaths and may have contributed to a further thirty five.

In October 2016 NHS Improvement released the Patient Safety Alert, 'Reducing the risk of oxygen tubing being connected to air flowmeters following incidents in which tubing had been connected to the wrong flow meter.

In addition, over recent years, Estates and Facilities Alerts have been issued by the Department of Health in which issues with medical gasses have been raised. These include:

- June 2010: The risk associated with unsecured cylinders was highlighted following the death of a patient (EFA/2010/008)
- October 2011: Following the uncontrolled release of liquid Oxygen from a vacuum insulated evaporator (VIE) the importance of ensuring resilience of supply with a medical gas pipeline system was highlighted, together with managing the associated risk of potential ignition of flammable materials if ignition sources are present.
- June 2014: Following reports of exploding / igniting e-cigarettes, the risk associated with these being used in an oxygen rich environment was highlighted. These devices should not be used (or charged) in the vicinity of a patient receiving oxygen therapy.

Common themes identified from the review of these incidents, local investigations and other sources were:

- **Prescribing:** failure to or wrongly prescribed
- **Monitoring:** patients not monitored, abnormal oxygen saturation levels not acted upon
- **Administration:** confusion of oxygen with medical compressed air, incorrect flow rates, inadvertent disconnection of supply
- **Equipment:** empty or unstable cylinders, faulty and missing equipment
- **Fires:** affecting patients through mismanagement of oxygen

The **Health Technical Memorandum (HTM) 02-01¹ (SHTM 02-01 in Scotland)** describes the corporate responsibilities held by various officers within an NHS hospital. Working under the overall authority of the Trust Chief Executive the **Chief Pharmacist** holds significant responsibilities in governance of medical gas pipework systems.

NHS Protect “Guidance on the security and storage of medical gas cylinders” states: the **Chief Pharmacist** has overall delegated responsibility for medical gases within the NHS organisation. This includes ensuring that there are written policies and Standard Operating Procedures (SOP’s) in place on the management and safe use for all aspects of medical gas supply and administration.

2. Key Personnel

Chief Executive / Executive Manager - Ultimately responsible for the safe delivery of medical gases (from cylinders, or Medical Gas Pipeline Systems (MGPS)) in their hospital / organisation.

The Head of Estates / Operations Manager - holds responsibility for the maintenance and integrity of the MGPS through the work of the Authorised and Competent Persons (see below).

Authorising Engineer (AE) – A person with suitable qualifications (for example chartered engineer or incorporated engineer) and sufficient relevant experience to oversee and audit a number of medical gas systems and their associated authorised persons, and who can offer expert technical advice to MGPS managers and users. He/she will also be responsible for recommending Authorised Persons (MGPS) for appointment.

AE’s working within the NHS are named on a register maintained by the Institute of Healthcare Engineering & Estate Management (IHEEM)

Authorised Person (AP) MGPS - The person designated by the Executive Manager to be responsible for the day-to-day management of the MGPS at a particular site or sites. This includes the issue of permits in accordance with the permit-to-work procedure.

All AP’s should be appointed in writing by the Chief Executive / Executive Manager on the recommendation of the AE.

Competent Person (CP) MGPS – The person who carries out the instillation and / or maintenance work on the MGPS. The CP should receive appropriate training and be on a list of CP (MGPS) held by the organisation in which the work is taking place. This list should be held by the AP or project manager.

The Quality Controller (QC MGPS) - The person designated as the quality controller for MGPS. He/she is responsible for the quality control of the medical gases at the terminal units and manufacturing systems such as medical air compressors, oxygen concentrators and synthetic air systems.

QC MGPS working within the NHS are named on a register maintained by the NHS QC Medical Gas Subgroup on behalf of the NHS Pharmaceutical Quality Assurance Committee.

Designated Medical Officer (MGPS) and Designated Nursing Officer (MGPS): The medical or nursing officer designated by the chief executive to act as a focal point for communications related to MGPS in a specified department or departments. Ideally each department will have its own Designated Medical Officer (MGPS) and Designated Nursing Officer (MGPS).

Designated Portering and Security Managers – responsible for security, and cylinder distribution and management.

3. Key Chief Pharmacist Responsibilities

The unique nature of medicinal gases and their delivery / dispensing systems gives the Chief Pharmacist additional responsibilities to those already in place for other medicinal products used within the Trust / organisation.

3.1 Installation, modification and qualification of pipework systems

Instillation of any new pipework, or the modification of existing pipework will require qualification by an appropriately trained and registered Quality Controller (QC MGPS).

The appointment of a QC (MGPS) is formally made by the organisations Chief Executive on the recommendation of the Chief Pharmacist. The Chief Pharmacist must therefore be satisfied with the professional attributes of that person and their acceptance on the register of QC (MGPS).

HTM 02-01 (SHTM 02-01 in Scotland) states

“Only individuals who have been appointed to the Quality Controller (MGPS) register may act as Quality Controller (MGPS).”

“Inclusion on the register will normally be sufficient to qualify an individual to act as QC (MGPS) for any hospital Trust. However, the trust’s chief pharmacist may exercise the option to specify, or otherwise limit, those registered as QC (MGPS) who may operate on their site.”

Further information regarding the registration of QC (MGPS) can be obtained from ‘Registration of Quality Controllers (MGPS), Policy, Guidance and Application form’ produced by the NHS QC Medical Gas Subgroup on behalf of the NHS Pharmaceutical Quality Assurance Committee.

3.2 Safe Supply (MGPS)

HTM 02-01 (SHTM 02-01 in Scotland) recommends each Trust / Organisation has a Medical Gas Committee, on which pharmacy is represented. It is recommended by the NHS Pharmaceutical Quality Assurance Committee’s Medical Gas Sub Group that Chief Pharmacists take an active role within their Medical Gas Committee either directly or via appropriate delegation to somebody with sufficient knowledge to act. Responsibilities taken on by such a Committee would normally include:

- Appropriate location of cryogenic, cylinder and other installations
- Health and safety associated with staff, patient and delivery areas
- Telemetry systems
- Abnormal usage
- Continuity of supply & System back-up (duplex/triplex capability)
- Emergency responses
- Security
- Maintenance and testing
- Training of key staff
- Investigation of all incidents relating to medical gas use and supply.

3.3 Medicines Management:

An additional role of a Medical Gas Committee would be overseeing the clinical safety of medical gases within its Trust / Organisation. Of particular importance to Chief Pharmacists would be:

- Safe clinical use of gases as medicines
- Systems to assure correct and safe use of administration and monitoring equipment
- Safe prescribing policy
- Minimised use of cylinders in patient areas
- Training of key staff
- Monitoring of clinical incidents

3.4 Cylinder Management

HTM 02-01 (SHTM 02-01 in Scotland) recommends that regardless of operational infrastructure the Chief Pharmacist should take an active role in the management of medical gas cylinders. This includes ensuring that a system is in place for the safety, security and tracking of medical gas cylinders.

Sound cylinder management is important for the following reasons:

- Documentation needed to establish conformity of identity and quality with Ph.Eur. requirements is retained for possible inspection
- Stock control issues are important for maintaining adequacy and continuity of supply.
- Improper methods of cylinder storage may give rise to serious health and safety issues.

3.5 Audit

The Chief Pharmacist shall demonstrate the hospital meets requirements of key standards in delivery of gases as medicines. This is best achieved through a regular (at least annual) audit process, the results of which should be reported to the Trust's / organisations Medical Gas Committee.

4. Summary

As for all medicines the Chief Pharmacist is responsible for ensuring systems are place to assure the quality and continuity of medical gases within their Trust boundary.

5. Further Information

Additional training is available for Chief Pharmacists on their roles and responsibilities with regards Medical Gas's via the NHS TSET Medical Gas for Service Managers course run annually via the University of Leeds.

6. Bibliography

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With Thanks to Richard Goodman for his valuable comment and contribution.