Risk Assessment Prompt Sheet

Ref: PS:048:00	**Re : Safe Storage and Handling of Medical Gas Cylinders**				
Issue date:	April 2023	**Revised date:**		**Version No.**	1
Author(s):	National Health and Safety Function				

Note: Legislation:

Under Section 19 of the ***Safety, Health and Welfare at Work Act, 2005*** and associated Regulations**,** it is the duty of the employer to identify the hazards and assess the associated risks in the workplace.

All risk assessments must be in writing and the necessary control measures to eliminate or minimise the risks documented and implemented.

Hazard(s)

The main hazards associated with the safe storage and handling of medical gas cylinders are listed below *(non-exhaustive list)*:

- impact from a gas cylinder explosion or rapid release of compressed gas
- impact from parts of gas cylinders that fail, or any flying debris
- fire resulting from the escape of flammable/oxidising gases
- impact from falling cylinders
- manual handling injuries

Scope :

The content of this document applies to the safe storage and handling of medical gas cylinders only.

The following non-exhaustive list of prompts has been developed in line with the following published information:

- The British Compressed Gases Association (BCGA) Code of Practice 44, the storage of gas cylinders (Rev01) 2022
- Health Technical Memorandum 02-01: Part A British Compressed Gas Association 2006
- Health Technical Memorandum 02-01: Medical Gas Pipeline Systems Part B Operational Management 2006
- BOC Guidelines

Note 1: Medical gas pipeline systems and the clinical use/administration of medical gas (including the fitting of medical devices e.g. regulators) is out of scope. For guidance on medical devices associated with medical gas cylinders contact local Clinical Engineering Department or equivalent.

Note 2: Where there is a risk of occupational exposure to a medical gas when in use (e.g. clinical administration, connection to medical device, connection to manifold system) chemical agent risk assessments (CF:003) are completed. Refer to **Chemical Agent Risk Assessment** (CF:003)

Note 3: The prompt sheet is designed to support managers in consultation with their employees to review and update their risk assessments in relation to the safe storage and handling of medical gas cylinders.
The prompt sheet **is not** a risk assessment form. The completed prompt sheet can be referenced and appended to the **Risk Assessment Form** (General Risk Assessment Form CF: 005) to provide evidence of existing control measures in place.

No.		Y	N	N/A	If yes, Document Evidence
Section 1 – Safe storage and handling of medical gas cylinders					
1	A documented procedure is in place for the safe storage and handling of medical gas cylinders. *Note: Refer to Appendix 1, Section 1, No1, for suggested sections to be included in a medical gas cylinder procedure.*				
2	Local procedures are communicated to relevant personnel. *Note: Relevant personnel are those involved in the storage and handling of medical gas cylinders and others as appropriate.*				
Section 2 – Delivery of medical gas cylinders to site					
3	Arrangements are in place for the safe delivery of medical gas cylinders to site by the appointed supplier to include: • clear access to main store/designated delivery point • security of the store is managed (control of access keys) • each cylinder is secured in its designated area • the person receiving the cylinders is aware of their duties with regard to handling of medical gas cylinders				
4	No parking is permitted outside the medical gas delivery area other than for the loading and unloading of cylinders.				
Section 3 – Main Medical Gas Cylinder Store(s)					
5	Medical gas cylinder stores allow cylinders to be: • stored outdoors*and under cover • not subjected to extremes of temperature** • kept clean • be ventilated *A store is considered to be outdoors if the following conditions are met: • a minimum of 30 % of the perimeter is open (naturally ventilated), with no roof installed				

No.		Y	N	N/A	If yes, Document Evidence
	• a minimum of 50 % of the perimeter is open (naturally ventilated), with a roof installed Where these conditions are not achieved the store is not outdoors. A specific risk assessment shall be conducted to identify the necessary controls to achieve safe conditions for a store which is not outdoors. *Refer to Appendix 1, Section 3, No.5 for information on storage of medical gas cylinders where not outdoors.* ***Refer to the relevant Medical Gas Data Sheet* *Note: Ventilation is required to ensure that, in the event of a leak, the gas is adequately dispersed and will prevent a hazardous atmosphere being created.* *Note: Medical gas cylinders are stored and managed in a manner that ensures that they will be delivered in a clean state compatible with the environment in which they will be used.*				
6	The medical gas cylinder storage area is; • secure and • only accessible to authorised personnel				
7	Medical gas cylinder stores have adequate space for access/egress and level floor surfaces which are constructed from rigid, permanent non-combustible non-porous material e.g. concrete.				
8	Floor surfaces are free from slip and trip hazards, are practical for manual handling operations and easy to maintain and clean. *Note: Stores should have space to offer the ability to manoeuvre cylinders safely/trolley access.*				
9	The storage area has adequate lighting (day/night conditions) which allows for the identification of cylinders and associated signage.				

No.		Y	N	N/A	If yes, Document Evidence
	Note: Access to light switch should be unobstructed and accessible at the entrance or preferably external to the storage area.				
10	Arrangements are in place to ensure Medical Gas Data Sheets (MGDS) for each type of medical gas in stock are readily available to relevant personnel (e.g. in the store and manifold room). *Note: Medical gas cylinders require a MGDS not a safety data sheet (SDS).*				
11	Medical gas cylinder stores have separate clearly identified bays for full and empty cylinders. *Note: Refer to Appendix 1, Section 3, No. 11.*				
12	Medical gas cylinders are stored in accordance with the summary of products characteristics detailed within its associated Medical Gases Data Sheet.				
13	Medical gas cylinder stores are; • free from naked flames • free from combustible materials • free from all sources of heat and ignition • designated as 'No Smoking/Vaping' areas *Note: Combustible material is a material or gas which catches fire and burns easily e.g. paper, cardboard boxes, plastic, excessive vegetation.*				
14	Medical gas cylinder stores have firefighting equipment provided. *Note: Firefighting equipment required determined through local Fire Risk Assessment.*				
15	Where flammable or oxidising gases are stored a risk assessment is completed to determine whether protected electrical equipment is required. *Note: For further information refer to ATEX - Health and Safety Authority.*				

No.		Y	N	N/A	If yes, Document Evidence
16	Medical gas cylinder stores shall have adequate signage externally to provide safety information and warnings on the hazardous products being stored within. *Note: Refer to Appendix 1, Section 3, No. 16 for examples of external signage.*				
17	Different medical gases are separated and clearly identified by signage internally within the store to clearly identify the hazard classification of the gas. *Note: Refer to Appendix 1, Section 3, No. 17 for examples of internal signage.*				
18	Within the medical gas cylinder store large size cylinders (such as F, HX, ZX, G and J sizes) are stored vertically on floored* pens/bays. Individual cylinders must be secured by adequate means e.g. chains/lashing to prevent them falling over. *See prompt number 8. *Note: Not to be stored more than one cylinder high.* *Note: Refer to Appendix 1, Section 3, No. 18.*				
19	Within the medical gas cylinder store small size cylinders (such as C, CD, D and E sizes) are stored horizontally on shelves /racking (made of a material that will not damage the surface of the cylinders). *Note: Where horizontally stored they must not be stored by resting directly on the floor. When stored in shelves/racking there should only be 1 cylinder per rack to prevent damage caused by cylinders colliding with each other* *Note: Refer to Appendix 1, Section 3, No. 19.*				
20	Where the contents of a medical gas cylinder cannot be clearly identified/an issue is detected, it is removed from circulation and clearly segregated and				

No.		Y	N	N/A	If yes, Document Evidence
	tagged (tag describes the issue identified) in stores and supplier notified to collect.				
21	The only items stored in the medical gas cylinder store are the gas cylinders, their associated fittings and associated manual handling aids such as trolleys.				
22	Cylinders and their associated equipment should be protected from contact with oil, grease and hand creams, alcohol based gels/sanitisers.				
23	Cylinder labels remain clearly visible at all times and are not removed or covered. Unauthorised labels/tags must not be fitted.				
24	Where expiry dates are exceeded cylinders are clearly segregated in store, tagged and supplier notified to collect.				
Consider the following items in addition to the above where a cage is being used to store medical gas cylinders:					
25	The cage is permanently secured to an adjoining wall or solid floor.				
26	The cage is only accessible to authorised personnel. *Note: Refer to Appendix 1, Section 3, No. 26.*				
27	The mesh on the cage is small enough to prevent unauthorised tampering for example being able to operate a valve.				
28	Means such as chains and lashing are provided to secure individual vertical standing cylinders. *Note: Refer to Appendix 1, Section 3, No. 28.*				
29	The area around cage is; • free from naked flames • free from combustible materials • free from all sources of heat and ignition • designated as 'No Smoking/Vaping' areas *Note: The area around the external cage should be kept clear of combustible materials for a minimum distance of 3 meters.*				

No.		Y	N	N/A	If yes, Document Evidence
Note: For further information refer to BCGA (Publications - BCGA) Technical Information Sheet 48 Gas Equipment – Security Cages					
Section 4- Manifold Room(s)					
30	Manifold rooms are; • secure • only accessible to authorised personnel • kept dry and clean • ventilated *Note: Ventilation is required to ensure that, in the event of a leak, the gas is adequately dispersed and will prevent a hazardous atmosphere being created.*				
31	Manifold rooms have adequate space for access/egress and level floor surfaces which are constructed from rigid, permanent non-combustible non-porous material e.g. concrete.				
32	Floor surfaces are free from slip and trip hazards, are practical for manual handling operations and easy to maintain and clean. *Note: Stores should have space to offer the ability to manoeuvre cylinders safely/trolley access.*				
33	The manifold room has adequate lighting (day/night conditions) which allows for the identification of the cylinder and signage. *Note: Access to light switch should be unobstructed and accessible at the entrance or preferably external to the room.*				
34	Manifold rooms are; • free from naked flames • free from combustible materials • free from all sources of heat and ignition				

No.		Y	N	N/A	If yes, Document Evidence
	• designated as 'No Smoking/Vaping' areas				
35	Manifold rooms shall have adequate signage externally to provide safety information and warnings on the hazardous products being stored within. Note: *Refer to Appendix 1, Section 3, No. 16 for examples of external signage.*				
36	Different medical gases are separated and clearly identified by signage internally within the manifold room to clearly identify the hazard classification of the gas. *Note: Refer to Appendix 1, Section 3, No. 17 for examples of internal signage.*				
37	The number of medical gas cylinders in the manifold room is restricted to the minimum required for operational and reserve purposes. *Note: The manifold room should not be used for any other purpose* and the only items stored in the manifold room are the gas cylinders, their associated fittings and associated manual handling aids such as trolleys.				
38	Cylinders of different medical gases stored within the manifold room are segregated, secured and clearly identified by signage. *Note: Some small sites in the absence of a dedicated building may store small cylinders of all medical gas types in medical gas manifold rooms. In such cases a risk assessment should be undertaken, along with consulting local HSE Fire Officer and Authorised Person (AP) if appointed in the location.* *Note: Refer to Appendix 1, Section 4, No. 38.*				
Section 5- On site Transport					
39	Cylinders are not dropped, knocked or rolled. *Note: Cylinders rolled along the ground may damage or even open the valve.*				
40	Medical gas cylinders are transported in purpose designed trolleys only.				

No.		Y	N	N/A	If yes, Document Evidence
	Note: Refer to Appendix 1, Section 5, No. 40.				
41	Cylinders are fully secured during transportation using the provided strapping, lashing, chains etc. *Note: Refer to Appendix 1, Section 5, No. 41.*				
42	Trolleys used for the transport of cylinders are only used for that purpose and are free from grease, oil and hand creams, alcohol based gels /sanitisers.				
43	Prior to use a visual inspection is completed on the trolley to ensure it is fit for purpose.				
44	Arrangements are in place to ensure inspections of trolleys forms part of a planned preventative maintenance programme.				
45	Where medical gas cylinders are transported in a goods vehicle they are fully secured.				
46	Vehicles transporting gas cylinders using public roads should, where applicable, be appropriately marked in accordance with the Carriage of Dangerous Goods. *Note: For further information contact your local Dangerous Goods Safety Advisor (DGSA).*				
Section 6– Local Storage (Department/Ward)					
47	Where cylinders are stored locally in designated stores on wards/departments a specific risk assessment is conducted to identify the necessary controls to achieve safe conditions for a store which is not outdoors. *Refer to Appendix 1, Section 3, No. 5 for information on storage of medical gas cylinders where not outdoors.*				
48	Emergency/reserve medical gas cylinders securely placed in a trolley on the ward/department have designated 'parking' areas which are clearly identified by signage.				

No.		Y	N	N/A	If yes, Document Evidence
	Note: Storing medical gas cylinders on a corridor/within a circulation area is not advised as the cylinders are vulnerable to damage and tampering.				
49	Personnel have access to medical gas cylinder holders/cradles which are used. *Note: Refer to Appendix 1, Section 6, No. 49.*				
50	The cylinder is set up and tested before placing near the patient. The cylinder is placed in an appropriately designed holder to support/hold the cylinder whilst in use adjacent to the patient. *Note: Medical gas cylinders are not placed on the patient's/service users bed linen, wheelchair or porter's chair.*				
51	Medical gas cylinders are to be secured using an appropriate medical gas cylinder holder during patient transfers. *Note: Refer to Appendix 1, Section 6, No. 51.*				
Section 7 - Empty Cylinders / Returns					
52	Where a defect with a cylinder has been identified, it is removed from circulation, clearly segregated from all other cylinders, returned to an external secure store for collection by the supplier. *Note: A defective (do not use) label is securely attached to the identified cylinder detailing the issue identified.*				
53	When cylinders are empty/out of date/no longer required they are stored in the main store in their designated signed area. *Note: Excess stock of gas cylinders, empty gas cylinders or gas cylinders that are no longer required are to be returned promptly to the owner/gas supplier*				
54	Cylinders placed in or returned to store areas should be checked for leakage to ensure that the cylinder valve is fully turned off.				

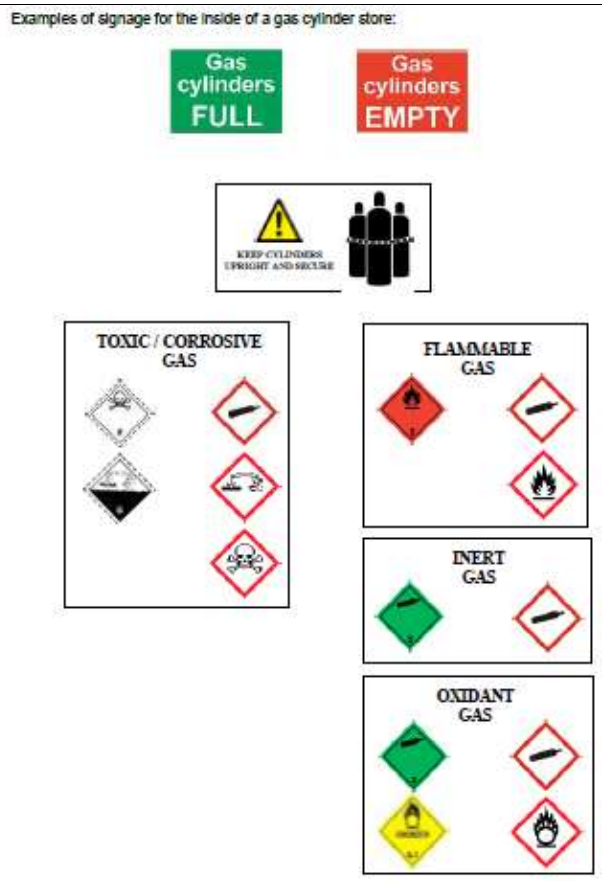
Section 8 – Training					
55	Training needs assessment(s) are completed to identify relevant personnel who require medical gas cylinder training. *Refer to – HSE Policy on Statutory OSH Training* *Note: Relevant personnel include those who are required to handle and store gas cylinders.* *Note: Specific training is required for changing cylinders on medical gas manifolds or medical equipment.*				
56	Arrangements and controls measures have been implemented to avoid or reduce the manual handling of cylinders as far as is reasonably practicable.				
57	Records of training are retained and available.				
Section 9 – Emergency Arrangements					
58	There is a system in place for managing and reporting incidents related to medical gas cylinders in line with the *HSE Incident Management Framework*.				
59	Local emergency plans have taken account of the risks associated with medical gas cylinders.				
60	Relevant personnel are trained on local emergency plans regarding medical gas cylinders.				
61	The location of medical gas cylinder store(s) and manifold rooms are clearly marked on the site plan for identification in the event of an emergency.				
Section 10 - PPE					
62	The choice and selection of PPE is based on risk assessment. *Note: PPE should be kept in good condition, clean and free from oil, grease hand creams and alcohol based gels/sanitisers.* *Note: It is recommended that heavy protective gloves (preferably textile or leather) and protective safety footwear should be worn when loading or unloading cylinders.*				

Use the space below to document any local existing control measures not referenced above	
No.	

Appendix 1

Section	No	
1 - Safe storage and handling of medical gas cylinders	1	Suggested sections to include in a medical gas cylinder procedure: 1. Roles & Responsibilities 2. Receipt, Labelling Procedures 3. Storage of Medical Gas Cylinders 4. Handling/Transportation Procedures 5. Removing cylinders from service 6. Training 7. Personal Protective Equipment 8. Emergency Procedures 9. Record Keeping *Note: Consider recent safety alerts from statutory bodies (HSA) and recognised providers/suppliers (BOC)*
3- Main medical gas cylinder store(s)	5	*Information on storage of medical gas cylinders where not outdoors* BCGA recommend an outdoor storage area. A documented risk assessment shall be conducted for all non-outdoor stores. The risk assessment may determine that a non-outdoor storage area may not be feasible or that, if feasible, it will require increased controls to maintain safety. Examples of non-outdoor applications include: • a standalone building, with solid sides and a roof • a cellar/basement • a converted shipping container • a room in a building, with an external door with louvered vents and air bricks; • a room inside a building (with no external access) The following topics to be included within the risk assessment: • the proposed location of a store in a non-outdoor area and the infrastructure requirements necessary • an assessment of the ventilation and any associated atmospheric monitoring • requirements, to ensure there is adequate ventilation (to prevent a hazardous atmosphere being created, for example, from leakage from a cylinder) • an assessment to determine an appropriate level of fire and building safety • a determination of which people may be at risk from the hazards of the store and associated operations • the impact on the store from other unrelated activities and hazards • the logistics of moving cylinders • the hazardous properties of the gases and the quantity

3- Main medical gas cylinder store(s)	11	  
3- Main medical gas cylinder store(s)	16	

3- Main medical gas cylinder store(s)	17	
3- Main medical gas cylinder store(s)	18	

3- Main medical gas cylinder store(s)	19	
3- Main medical gas cylinder store(s)	26 28	
4 – Manifold Rooms	38	
5- Onsite transport	40	   

5- Onsite transport	41	  
6 – Local storage (ward/department)	49	  
6 – Local storage (ward/department)	51