



PS66 Guideline on the role of the anaesthetist in commissioning medical gas pipelines

Background Paper

1. Purpose

From time to time anaesthetists as a requirement of their employment or by arrangement with other health care facilities may be invited to participate in testing and certification of medical gas pipeline systems (MGPS) in healthcare facilities. The accompanying guideline is intended to assist anaesthetists in undertaking this task.

2. Scope

The document applies to anaesthetists involved in the testing and certification of the results of operational testing of the gas identity at the terminal units during the commissioning of a MGPS.

Other Clinical Practitioners who may also be involved in commissioning MGPSs may wish to refer to the guideline.

3. Background

The demand for access to medical and surgical care has seen construction of new healthcare facilities, expansion or redevelopment of existing ones. In each case, medical gases will be delivered to a range of locations including theatre suites, critical care units, and wards.

Instances have arisen where incorrect gases have been administered resulting in serious consequences. Such errors may occur anywhere along the delivery system and it is imperative to correctly identify and label gases emerging from the gas outlets to guarantee safety.

ANZCA has received requests from fellows whose services have been sought in the commissioning process for MGPSs. This demonstrated the clear need for developing a guideline for this purpose.

4. Discussion of issues

The proposal to develop a guideline was approved in November 2018, however, due to the relevant standard AS 2896-2011 *Medical gas systems – Installation and testing of non-flammable medical gas pipeline systems*, being under review by Standards Australia it was decided to delay

development until the standard had been finalised. However, with delays in the expected time-frame for completion the decision to proceed irrespective, was made in July 2019.

In order to ensure that the accompanying guideline is current it was decided to reference AS 2896:2011, but to reference the updated version when it becomes available.

The relevant clauses in AS 2896:2011 include the following:

- **5.6.5 Test for gas identity**
with exclusion of 5.6.5.3 *Test for odour*
- **5.7.1 Operational test**
- **FIGURE H1 LOGISTIC DIAGRAM FOR TESTING OF PIPELINE SYSTEM**
Final box – *Gas purity test see Clause 5.6.5*
- **APPENDIX I TERMINAL UNIT TEST FORM**

Inconsistencies in AS 2896:2011 and interpretation for anaesthetists were considered as follows:

- **Clause 5.2 Testing, verification and certification**

There is a contradictory statement in Clause 5.2, paragraph 2.

With cross-connection testing, a member of the health care facility shall be present to verify the testing. This testing may be carried out in conjunction with the operational test (see Clause 5.7.1).

Cross-connection testing is performed before the designated working gas has been connected to the pipeline system. The **operational test** is the final step of testing and is done once the designated gas has been connected and the pipes purged with this gas. Consequently, these tests cannot be carried out in conjunction.

- **Clause 5.6.5.1 General**

There is an error/misleading word statement in Clause 5.6.5.1, paragraph 2 and in Clause 5.7.1 paragraph 1.

Clause 5.6.5.1 Whenever a new medical gas piping system is installed or a major addition is installed from an existing system, a test for contamination this shall be carried out.

Clause 5.7.1 Prior to commissioning of a medical gas system, testing by a designated person shall be performed to determine that the concentration of the medical gas is correct and that there is no contamination.

The error here is that the test is for identity of the gas at the terminal unit, not for contamination by particles or gases.

- **Figure H 6 Test Certificate Form (T5) for purity of medical air produced from on-site compressor systems and gas identity**

Part 12. Tests for Gas Identity (Refer Clause 5.6.5)

The statement after *Test results* is inconsistent with the testing described in the body of the document and is misleading.

These test procedures have been carried out in accordance with the requirements of AS 2896:2011. All warning system function tests are satisfactory.

Summary: Testing of alarms and warnings are not required to be observed by an anaesthetist. The anaesthetist cannot sign off on Test Certificate Form (T5) Part 12, as it implies s/he was involved in testing alarms.

Advice: Anaesthetist's signature on the Terminal Unit Test Form is for witnessing and confirming the test results. This is done on behalf of the health care facility. The Terminal Unit Test Form copy is handed to the health care facility and it the responsibility of the facility to sign off on Test Certificate Form (T5) Part 12.

4.1 Personnel

For the purposes of an ANZCA guideline it was developed with anaesthetists in mind, however, it is applicable to other Clinical Practitioners who may be involved.

Verification of final operating tests performed on terminal outlets requires a Clinical Practitioner experienced in administration of medical gases to patients to be present and witness the tests determining that the identification of the medical gas at the terminal unit is correct. In cases where only non-asphyxiating gases, such as oxygen, medical air and suction are supplied by the MGPS an anaesthetist is not required. However, where asphyxiating medical gases, such as nitrous oxide, carbon dioxide and/or non-medical gases are piped, a delegated anaesthetist must participate in the identification tests at the terminal unit.

5. Procedure

This is described in detail in the guideline. Although not required by AS 2896:2011, it is recommended that each terminal unit is confirmed to be labelled correctly and has the correct gas specific sleeve index.

5.1 Identification and concentration of gas at the gas terminal outlet

The gas at each terminal outlet must be the correct gas at the correct concentration for that outlet.

Where only one asphyxiating gas is piped, such as nitrous oxide or carbon dioxide or one non-medical gas an oxygen analyser is used. If more than one asphyxiating gas is piped an oxygen analyser cannot differentiate between the two gases and another method of positive identification must be used such as a gas analyser.

Using various gas analysers the following readings for the specific gas should be as given in Table 1.

6. Documentation

A copy of Form 1, which is equivalent to Appendix I of AS 2896:2011, that must be used to document the results of testing is included in the guideline.

7. Summary

The following is a summary of the role and responsibility of an anaesthetist in testing for commissioning a medical gas pipeline system, according to AS 2896:2011 *Medical gas systems— Installation and testing of non-flammable medical gas pipeline systems*.

An anaesthetist is required to confirm the identification of the gas at the terminal unit and gas specific outlet [inlet for suction] in a medical gas supply at which the user makes connection or disconnection) when there are piped gases in addition to air, oxygen and suction. Otherwise, another Clinical Practitioner (non anaesthetist) may undertake this task.

Other tests of the medical gas pipeline system required by the standard do not require an anaesthetist. It is the responsibility of the health care facility to find a person with the relevant training and skills for the testing, such as a biomedical engineer.

An anaesthetist is not obliged to take on testing beyond confirmation of the gas identity and should not engage in other testing unless confident to do so.

The accompanying guideline specifies the minimum required according to AS 2896:2011 and describes the process. If Fellows agree to be involved with other additional testing this is done in their own capacity but not in the role of anaesthetist as a requirement of AS 2896:2011.

Anaesthetists and other health care facility designated persons should not certify results of tests that were not personally observed.

Professional documents of the Australian and New Zealand College of Anaesthetists (ANZCA) are intended to apply wherever anaesthesia is administered and perioperative medicine practised within Australia and New Zealand. It is the responsibility of each practitioner to have express regard to the particular circumstances of each case, and the application of these ANZCA documents in each case. It is recognised that there may be exceptional situations (for example, some emergencies) in which the interests of patients override the requirement for compliance with some or all of these ANZCA documents. Each document is prepared in the context of the entire body of the College's professional documents, and should be interpreted in this way.

ANZCA professional documents are reviewed from time to time, and it is the responsibility of each practitioner to ensure that he or she has obtained the current version which is available from the College website (www.anzca.edu.au). The professional documents have been prepared having regard to the information available at the time of their preparation, and practitioners should therefore take into account any information that may have been published or has become available subsequently.

Whilst ANZCA endeavours to ensure that its professional documents are as current as possible at the time of their preparation, it takes no responsibility for matters arising from changed circumstances or information or material which may have become available subsequently.

Promulgated: 2019
Reviewed:
Date of current document: Apr 2020

© Copyright 2020 – Australian and New Zealand College of Anaesthetists. All rights reserved.

This work is copyright. Apart from any use as permitted under the Copyright Act 1968, no part may be reproduced by any process without prior written permission from ANZCA. Requests and inquiries concerning reproduction and rights should be addressed to the Chief Executive Officer, Australian and New Zealand College of Anaesthetists, 630 St Kilda Road, Melbourne, Victoria 3004, Australia. Email: ceoanzca@anzca.edu.au

ANZCA website: www.anzca.edu.au