



Practice lecture of anaesthetic equipments

DAILY ANESTHETIC MACHINE CHECKOUT

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Procedures for Checking Anesthetic machine

The following checks should be carried out at the beginning of each operating theater session. In addition, specific checks should be carried out before each new patient during a session or when there is any alteration or addition to the breathing system, monitoring or ancillary equipment. It is the responsibility of the anesthetist to make sure that these checks have been performed, and the anesthetist must be satisfied that they have been carried out correctly. In the event of a change of anesthetist during an operating session, the status of the anesthetic equipment must be confirmed, including that a formal check has been performed.

1-Power Supply:

Check that the anesthetic workstation and relevant ancillary equipment are connected to the mains electrical supply (where appropriate) and switched on. The anesthetic workstation should be connected directly to the mains electrical supply, and only correctly rated equipment connected to its electrical outlets.

Multisocket extension leads must not be plugged into the anesthetic machine outlets or used to connect the anesthetic machine to the mains supply. Hospitals should have backup generators, and many operating theaters will have their own backup system. Anesthetists should know what is available

where they are working. Backup batteries for anesthetic machines and other equipment should be charged.

2-medical gas supply:

Identify and take note of the gases that are being supplied by pipeline, confirming with a “tug test” that each pipeline is correctly inserted into the appropriate gas supply terminal. Note that excessive force during a “tug test” may damage the pipeline and/or gas supply terminal.

- 1. Check that the anesthetic apparatus is connected to a supply of O₂ and that an adequate reserve supply of O₂ is available from a spare cylinder.**
- 2. Check that adequate supplies of any other gases intended for use are available and connected as appropriate. All cylinders should be securely seated and turned off after checking their contents.**
- 3. Carbon dioxide cylinders should not be present on the anesthetic machine. Where a blanking plug is supplied this should be fitted to any empty cylinder yoke.**
- 4. Check that all pressure gauges for pipelines connected to the anesthetic machine indicate 400–500 kPa.**
- 5. Check the operation of flowmeters, where these are present, ensuring that each control valve operates smoothly and that the bobbin moves freely throughout its range without sticking. If N₂O is to be used, the antihypoxia device should be tested by first turning on the N₂O flow and ensuring that at least 25% O₂ also flows.**

6- Operate the emergency O₂ bypass control and ensure that flow occurs from the gas outlet without significant decrease in the pipeline supply pressure. Ensure that the emergency O₂ bypass control ceases to operate when released.

3-Breathing System and Vaporizers:

Whole breathing system:

Check all breathing systems that are to be used and perform a “two-bag test” before use. Breathing systems should be inspected visually and inspected for correct configuration and assembly. Check that all connections within the system and to the anesthetic machine are secured by “push and twist”.

Ensure that there are no leaks or obstructions in the reservoir bags or breathing system and that they are not obstructed by foreign material. Perform a pressure leak test (between 20 cm H₂O and 60 cm H₂O) on the breathing system by occluding the patient-end and compressing the reservoir bag.

Vaporizers:

Manual leak testing of vaporizers was previously recommended routinely. It should only be performed on basic “Boyle’s machines” and it may be harmful to many modern anesthetic workstations. Refer to the manufacturer’s recommendation before performing a manual test. Check that the vaporizer(s) for the required volatile agent(s) are fitted correctly to the anesthetic machine, that any locking mechanism is fully engaged and that the control knobs rotate fully through the full range(s). Ensure that the vaporizer is not

tilted. Turn off the vaporizers. Check that the vaporizer(s) are adequately filled but not overfilled, and that the filling port is tightly closed.

Manual leak test of vaporizer:

1-Set a flow of O₂ at 5 L/minute and with the vaporizer turned off, temporarily occlude the common gas outlet. There should be no leak from any part of the vaporizer and the flowmeter bobbin (if present) is working properly.

2. Where more than one vaporizer is present, turn each vaporizer on in turn and repeat this test. After this test, ensure that the vaporizers and flowmeters are turned off.

Changing and filling vaporizers during use:

It may be necessary to change a vaporizer during use. Where possible, repeat the leak test; failure to do so is a common cause of critical incidents. Some anesthetic workstations will automatically test vaporizer integrity. It is only necessary to remove a vaporizer from a machine to refill it if the manufacturer recommends this. Vaporizers must always be kept upright. Tilting a vaporizer can result in delivery of dangerously high concentrations of vapor.

4-Carbon Dioxide Absorber:

Inspect the contents and connections and ensure there is adequate supply of CO₂ absorbent. Check the color of the absorbent.

5-Alternative Breathing Systems:

For Bain-type and circle coaxial systems, perform an occlusion test on the inner tube and check that the APL valve, where fitted, can be fully opened and closed.

6-Ventilator:

Check that the ventilator is configured correctly for its intended use

- Ensure that the ventilator tubing is securely attached
- Set the controls for use and ensure that adequate pressure is generated during the inspiratory phase
- Check that alarms are working and correctly configured
- Check that the pressure relief valve functions correctly at the set pressure.

THANK YOU