Step 1 - O₂ supply test

Frequency: 3-6 monthly
Problem: loss of cylinder O₂
Solution: saves $$ on loss of O₂
O₂ supply includes the oxygen cylinder, regulator, high pressure oxygen hose/ connections, the flowmeter valves and O₂ flush valve (turned off). Connect the machine to the O₂ cylinder in the usual manner. Turn the O₂ flowmeter valve off and turn the O₂ cylinder valve on. Then turn the cylinder valve off and mark the pressure (needle position) on the regulator gauge using autoclave or electrical tape. (see Figure 1) The guage pressure should not drop by more than 1000 kPa (1 graduation) in 1 hour. Generally requires workshop service to resolve.

Step 2 - flowmeter output test

Frequency: 3-6 monthly
Problem: Inadequate delivery of inhalation anesthetic - patients wake up.
Solution: predictable anesthesia; saves $$ on loss of O₂
This requires an empty 1 or 2 litre breathing bag attached to the common gas outlet. (see figure 2) Turn on the flowmeter valve to 2 litres/min. and use a watch to time how long the breathing bag takes to fill. 2 litre bag should fill in 1 min. Will require workshop service to resolve.

Step 3 - Pressure testing flowmeter, vaporiser and O₂ flush valve

Frequency: monthly
Problem: WAG pollution and inadequate delivery of inhalation anesthetic. Leaking vapourisers cost $$.
Solution: more predictable anesthesia, better air, happy people.
Use the O₂ flush valve to fill the breathing bag to full distension or 20 cm H₂O if you have a pressure guage (figure 4). Observe for 1 minute. The pressure should not drop. Leaks may be caused by poor connections, O₂ flowmeter seal leaks (see figure 3), vaporiser faults etc. Will require workshop service to resolve.

Step 4 - Patient breathing circuit pressure testing

Frequency: daily
Problem: WAG pollution (considerable) and variability in anesthetic depth.
Solution: more predictable anesthesia, better air, happy people.
Change the CO₂ absorbent before starting if half the canister is exhausted (or 100 mls of Anesetheticas been used in the vaporiser). Check the vaporiser fluid level and fill. Occupational exposure to WAG is minimised by filling vapourisers at the end of the work day.

TEST
a. Install a clean breathing bag and breathing hoses
b. Turn on the O₂ supply & check the pressure gauge level
c. Check the O₂ flowmeter is off and the indicator reads zero
d. Close the pop-off (pressure relief) valve on the absorber (Figure 6)
e. Turn the vaporiser on to 1%
f. Occlude the patient ET tube connection (Y-piece connection) as shown in figure 5
g. Turn on the O₂ flowmeter to ensure the bag fills normally, then turn it off
h. Press the O₂ flush valve to fill the circuit until the pressure guage manometer reads 20 cm H₂O (breathing bag distended - figure 5)
i. With no more gas flow, pressure should not drop more than 5 cm H₂O / 30 sec.
j. With the patient ET tube connection still occluded, relieve the pressure in the circuit by opening the pop-off valve (figure 6). This also tests the scavenging system patency. Do not relieve pressure by releasing the patient ET tube connection, because this may result in CO₂ absorbent particles entering the inspired limb of the breathing circuit.

Common Sites for Leaks in the patient breathing circuit include:
- Holes in hoses or bags (replace)
- Hose and bag connections
- Inspiratory/respiratory valve connections
- Pop-off valve left open
Leaks that are not obvious can be located by using soapy water to produce bubbles at leak sites during pressure check (figure 7). Dilute dishwashing liquid in a syringe works well.

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