



Eagle Eye Anesthesia

11233 St John's Industrial Parkway S.
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8 Reasons for Inadequate Patient Depth (in order of likelihood)

CO2 absorbent- not fresh or not changed often enough will cause increase in CO2 in patient:

- If CO2 absorbent is not able to remove CO2 produced by the patient, it will increase within the breathing circuit and eventually in the patient.
- Increased CO2 will keep patients light, require more anesthetic, increase breathing rate.
- Cause: Expired soda-sorb, or absorbent used for more than 10 hours total usage, bag or bucket left open to room air for extended length of time
- To confirm: CO2 monitor will show increased CO2 readings or trending.
- To resolve: Replace soda-sorb with a new unopened source.

Leaks:

- Low pressure leak- breathing circuit, bag, absorber, connections, hoses, Negative pressure relief valve
- Cause: Full dosage of Isoflurane is not making it to the patient, leaking out into the room, and room air entering the system.
- To confirm: Pressure test machine, breathing circuit and bag prior to every anesthetic procedure.
- To resolve: replace leaking breathing circuits and bags, repair leaking/broken components on machine.

Vaporizer causes:

- Calibration low, fill port seal leak, internal leak, manifold leak, cap seal leak, bad thermostat.
- Calibration and proper operation of the vaporizer should be checked yearly by a qualified service technician and be recalibrated if the output is no longer within acceptable range.
- Multiple vaporizers connected in series could affect output of the vaporizers due to increased back pressure.
- Pressure testing with vaporizer in on position may indicate slow pressure leak from Control valve seal or fill cap seal.



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Check Valves / Dead Space:

- Check valves: Warped, homemade, missing, not closing completely will not allow gas to be circulated properly and therefore not passing through the CO₂ absorbent.
- Dead Space: (defined as the area where inhalation and exhalation gasses can mix during patient ventilation)
- If check valves are not operating correctly the breathing circuit becomes one big dead space.
- **Breathing circuit – F-circuit:** inner hose **must** be attached at machine / inspiration end, if it has come off the breathing circuit no longer is functioning as a one way circuit and the patient is rebreathing their exhale (CO₂ not being absorbed, no fresh O₂ or anesthetic) resulting in one big dead space.

Flush Valve

- Leaking flush valve will dilute vaporizer output if the flush valve connects to the system after (downstream of) the vaporizer. (This is common on most machines but not all machines)

Active Scavenging

- Too high vacuum pressure will draw out gas, flattening the bag. Anesthetic gas will be actively scavenged away prior to the patient receiving it. Increased vacuum pressure can also be caused by dirty or clogged “atmospheric equalizers” (white crosses, air inlet valves on scavenging hose).
- To test:
- Flow meter on 2 LPM, breathing circuit occluded or closed with thumb or palm of hand, 1 liter bag on machine, pop-off valve open.
- Bag should become passively full (full bag but manometer showing 0-4 cmH₂O) in approximately 30 seconds.
- At that point, the manometer may increase slightly (up to 4 cmH₂O pressure) but no higher. This is the point at which gas is exiting through the pop-off valve.
- If the bag does not seem to inflate at all, remaining flat, there are 3 causes: 1) Old style pop-off valve, 2) Leak in the machine or breathing circuit, 3) active scavenging vacuum pressure too high.

Flow meter

- Incorrect reading (falsely high) will only be sending a very low flow of O₂ to the vaporizer (will see very slow movement of anesthetic percentage during analysis when changing the dial setting). This is a very rare occurrence and usually after flow meter work has been performed.

Anesthetic agent

- Incorrect agent used for specific vaporizer, i.e. Sevoflurane vs. Isoflurane.
- “Bad batch” of anesthetic agent, usually tied to a specific lot number. Very rare, usually affects multiple machines as it is the only common factor between multiple machines.