

You may encounter several issues related to the ventilator -and its circuit. They all have to be treated urgently. These are the followings:

Technical failure from the ventilator (though extremely rare in the last generation models)

- **Circuit blockage**
- **Circuit disconnection**
- **Circuit deterioration**

I call "circuit" what links the ventilator to you ; hereby I include the tracheotomy itself !

In all of these cases, the ventilator alarm will ring. The sensitivity of the alarm device, and the duration of the alarm can both be configured; and they both have to be set up by a specialist or a technician regarding how you feel about them.

When your ventilator rings *without any noticeable reason*, these are the four things to do urgently :

- Observe the patient's emotions and reactions ;
- Check the screen of the ventilator to see which problems the machine has detected ;
- Put your hand on the patient's rib cage to check if a ventilation still occurs or not ;
- Observe a total silence in the room, so that any eventual leak in the circuit can be noticed

Once *all* of these four acts are done, one has to precisely identify the problem

Possible scenarios:

- The ventilator displays a failure; in this case *it must immediately be replaced by the emergency ventilator*; the latter has to be close by and ready to run.
- The ventilator displays another message, such as "Obstruction", "Low pressure" or "High pressure", for instance (I can't get into specific details about alarm message displays because they can be different depending on the device you live with). In that case, one has to check the circuit. *It may be either obstructed, pierced or disconnected.*

We will now focus on each individual possibilities:

A) **Circuit blockage:** There are mainly two obstruction causes. The first one is frequent, when there's *only a slight obstruction of the inner cannula - by secretions*. Tracheal suctioning will overcome this issue; but, some other cases may occur where the obstruction is recalcitrant, mucus plugs for instance. In that case, one has to instill physiological serum inside the cannula in order to liquefy the plug, and repeat tracheal suctioning. If the plug

resists despite the serum, one has to change the inner cannula. These plugs rarely come by without any notice; they are usually preceded by the coloration and/or the thickening of the patient's tracheal secretions. To prevent that, one can perform an aerosol therapy session to liquefy the secretions; but if they are too colored and thick, it is possibly a sign of infection.

The last obstruction I wanted to share with you is extremely rare and difficult to identify. *It's an obstruction of the filter* - a.k.a. "the nose" - caused by the ejection of secretions during severe coughing. Actually folks, it has happened to me only once. In that case, *one has to urgently replace the filter!*

B) Circuit disconnection: The circuit can be disconnected from multiple points, - or "detach" to use a technical term. One has to observe carefully the circuit but, foremost, listen to it; it is possible to easily notice the disconnection thanks to the sound that the leaking air emits. *Never hesitate to manually check that each and every connection is properly done.* If not, one will have to reconnect one of them. I strongly advise to check *each and every connection* after the circuit has been moved or manipulated.

C) Circuit deterioration: Although extremely rare, the circuit may be pierced, following a (very) bad manipulation or, worst, a manufacturing defect. In that case - and once again -, observation, visual and acoustic, will help you determine where it occurs - remember to observe a total silence in the room while you investigate for the leak (as aforementioned in the beginning of this text). *When the leak has been found, one has to replace urgently the defectuous part of the circuit!* Folks, it's a fine moment to understand why it's mandatory to have every single piece of the circuit at hand-range, in triplicate and *ready to use* (some packages can take so much time to open...). I strongly recommend to have the whole circuit already built on the emergency ventilator, this will make the urgent shift of equipment easier.

But if the failure remains undisclosed and the patient is having respiratory difficulties, one has to call for emergency services and, meanwhile, put the patient under Bag Valve Mask (B.V.M.). I advise to put the B.V.M. where the filter is; that will make tracheal suction possible, if need be. B.V.M.'s functioning is quite simple, you just need to configure its cycles *onto your own (as the helper's) breath* (approximately 15 cycles per minute) and to call for emergency services, or take the time to identify the failure.

If a power failure happens, be reminded that ventilators are equipped with long lasting batteries, so stay calm ☐

Please, ask to every person susceptible to stay alone with you to learn this entire document,

and everything's gonna be alright...☐

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