

ALS post-tracheostomy care

directory

1. Key points of post-tracheostomy care.....	4
1.1 Tools and equipment:.....	4
1.2 Drug preparation:	4
1.3 Main learning content during hospitalization:	4
1.3.1. Learn to suction sputum (taught on site);	4
1.3.2. Learn to adjust the parameters of the ventilator.....	4
1.3.3. Learn to use oxygen concentrators, nebulizers, and phlegm machines;	5
1.3.4. Nursing knowledge after returning home	5
1.3.5. Diet matching.....	5
2. Nursing after tracheostomy.....	5
2.1 Preparation	5
2.1.1. Suitable environment	5
2.1.2. Items are readily available	5
2.2 Specific operations (sucking and dissolving phlegm, turning over, diet, mouth, stool and urination, other precautions)	5
2.2.1: Suction phlegm and dissolve phlegm	5
2.2.2: Turn over.....	7
2.2.3: Dietary conditioning	7
2.2.4: Communication.....	8
2.2.5 Prevention of local infection:	9
2.2.6 Oral care.....	9
2.2.7: Pooping and peeing.....	10
2.2.8: Miscellaneous precautions	10
2.2.9: Emotions	11
2.2.10: Sleep.....	11

2.2.11: Pain relieves itching.....	11
3. Common complications after tracheostomy	11
3.1. Detube (need to learn how to deal with out-of-tube):.....	11
3.2. Bleeding:	12
3.3. Subcutaneous emphysema:	12
3.4. Infection:	12
3.5. Tracheal wall ulcers and perforations:	12
3.6. Subglottic granulomas, scarring and stenosis:	12
4. Nasal feeding and gastrostomy need to pay attention to problems.....	12
4.1 Nasal feeding needs to pay attention to:	12
4.2 Gastrostomy needs to be paid attention to:	13
Balloon tube technology gastroleak use tube priority No. 18 tube> No. 16 tube > No. 15 tube.....	13
4.2.1. Preparation before fistula	13
4.2.2. Postoperative care of fistula (constant temperature kettle).....	13
4.2.3. Diet after fistula	13
4.2.4. Fistula care.	14
4.2.5. Take a bath after fistula.....	14
4.2.6. Travel and fistula suspension after fistula	14
4.2.7. Selection of food injector	14
4.2.8. Fistula oral exudate	14
4.2.9. Pipe blocking	15
4.2.10. Granulation treatment	15
4.2.11. Stitch removal method	15
4.2.12. Balloon water change.....	16
4.2.13. Treatment of out-of-tube.....	16
4.2.14. Pipe replacement.	16
5. Equipment maintenance.....	16

5.1 Philips Wellcome Trilogy 100 Ventilator Maintenance and Precautions.....	16
5.2 Common sense of coughing up phlegm machine maintenance	17
5.3 Working principle and maintenance of oxygen concentrator	18
5.3.1 First acquaintance with oxygen concentrator	18
5.3.2 Oxygen concentrator maintenance common sense	18

1. Key points of post-tracheostomy care

1.1 Tools and equipment:

(Combined with several posts, I don't understand the specific function and usage of some items)

Ventilator, spare ventilator and spare line, simple respirator (first aid ball), bacterial filter for ventilator, oxygen concentrator, oximeter, sputum aspirator, sputum suction tube, backup power supply (UPS / battery) or power outage emergency plan, endotracheal intubation cannula (open a few more when discharged, outpatient opening is very troublesome, frequency: change once every two months), tracheostomy disinfection gauze, needle tube (more open, for nasal feeding or gastrostomy, frequency: change once a week) medical hand sanitizer, disposable disinfectant gloves, iodophor, alcohol, disinfectant swab, Disinfectant tablets, tweezers, cotton balls, distilled water (opened by the hospital, or bought in the supermarket Watsons distilled water 4.5L), saline, sterile water, several small needles (for inflating the balloon), ultraviolet disinfection lamp (optional). Some items can be asked for in the hospital, and the rest are available in a certain treasure. Nursing consumables are gauze, suction tube, cotton ball, bacterial filter box, pee pad (coordinated, someone can prescribe it from the hospital), disposable gloves

1.2 Drug preparation:

Neurology conventional medicines, other emergency medicines: diuresis, anti-inflammatory, anti-cold, rhinitis, trauma and infection drugs, and other symptomatic drugs

1.3 Main learning content during hospitalization:

<http://www.alshome.com/thread-5332-1-1.html>

At least two people in the family are responsible for taking turns to take care of them, and before being discharged from the hospital, they can learn to suction sputum, change gauze, care for air incisions, turn over and pat their backs, and air bags to pump up. It's not that scary, but pay attention to the patient's phlegm, which is too inflamed and anti-inflammatory.

1.3.1. Learn to suction sputum (taught on site);

1.3.2. Learn to adjust the parameters of the ventilator

(The head nurse adjusts the parameters according to the blood gas analysis and card reading data);

1.3.3. Learn to use oxygen concentrators, nebulizers, and phlegm

machines;

The experience of using the phlegm coughing machine is <http://www.alshome.com/thread-16538-1-1.html>

1.3.4. Nursing knowledge after returning home

(Disinfection/replacement of gauze, inspection/deflation of airbags, cleaning/disinfection of ventilator pipes, platform valves, self-replacement of tracheostomy tubes and distubation treatment methods <http://www.alshome.com/thread-30523-1-1.html>);

1.3.5. Diet matching

(Combined with the advice of nutritionists, eat a reasonable diet and strengthen high protein intake).

2. Nursing after tracheostomy

2.1 Preparation

2.1.1. Suitable environment

The patient is placed in a quiet, clean and fresh room with room temperature at 21° C and humidity at 60%, and the tracheal cannula is covered with 2-4 layers of warm and wet gauze.

2.1.2. Items are readily available

Prepare emergency medicines and items, and some items should be placed at the bedside. Tracheal cannulas, tracheal dilators, surgical scissors, hemostats, dressing changing utensils and dressings, saline and saturated sodium bicarbonate, catheter kits, aspirators, oxidation cylinders, ventilators, flashlights, etc. should all be prepared and properly stored for emergencies.

2.2 Specific operations (sucking and dissolving phlegm, turning over, diet, mouth, stool and urination, other precautions)

2.2.1: Suction phlegm and dissolve phlegm

2.2.1.1 Overall concept

Prepare phlegm-reducing medicine (Mu Shutan, palm ammonium mixture, lung clearing and expectorant effervescent tablets, long-term cough pills, orange tree phlegm, centipede pills, DURO-TUSS can be eaten for ten days, which can clean the phlegm in the lungs and severely remove phlegm. Eat twice a day, 10 ml at a time, liquid, three bottles for a course

of treatment [Qiqi]) Bedridden patients have the most phlegm, and phlegm water is used.

Sputum suction is the primary job of tracheostomy patients. If phlegm blocks the trachea, it can cause other problems and even be life-threatening. Pay attention to whether the airbag of the endotracheal intubation tube is full at any time to avoid air leakage and deflation due to poor airbag closure.

Because the trachea is open after tracheostomy, aseptic operation during sputum suction is particularly important. When suctioning sputum, prepare the sputum suction tube first, and then put on sterile gloves on the hand holding the straw, and in principle, do not touch other places. Generally, one sputum suction tube and one bottle of medical saline (frequency) a day. If there is a lot of phlegm and viscous phlegm, you should pay attention to whether there is inflammation and should be treated by a doctor in time.

Ventilators can also sometimes experience unexpected conditions such as malfunction or power loss, so prepare a first aid bag in case of emergencies. The ventilator pipeline should always be checked whether it is firmly connected, and water should not be stored in the pipe, so as not to affect the normal operation of the ventilator. The tidal volume and respiratory rate provided by the ventilator should be determined by whether the patient feels comfortable, and these data are also adjusted according to the situation.

2.2.1.2 Precautions when sucking

*The sputum suction action should be gentle and fast to reduce damage to the tracheal wall. Generally, a No. 12 or 14 rubber or silicone catheter with moderate hardness, smooth surface and relatively large inner diameter is selected, or a special suction tube is used, or the thick blind end of the front end of the catheter can be cut off to make it into a crescent shape with an inward concave, and then cut two small holes on both sides to reduce the negative pressure during sputum suction at the head end and increase the sputum suction area. If the patient feels pain at the sternal stem and blood in the sputum, he should be vigilant against the possibility of bleeding, and once heavy bleeding occurs, endotracheal intubation should be performed immediately, and rescue measures such as hemostasis should be carried out at the same time.

*Pay attention to aseptic operation when suctioning sputum, wash hands before operation, strictly disinfect the catheter, use a catheter only once, adhere to the principle of inside-out when suctioning sputum, first inhale the secretions in the trachea, and then suck the secretions in the nose and

mouth.

*Take 3-5 deep breaths before suctioning, and if you are on a ventilator, you need to overventilate for 2-3 minutes to increase the partial pressure of oxygen in the alveoli, and then use a suction tube to aspirate the secretion quickly, accurately and gently. It is forbidden to lift and insert the phlegm tube up and down. A sputum suction time does not exceed 15 seconds, especially in patients with respiratory failure, and long-term negative pressure suction can cause hypoxia, dyspnea and suffocation. If there is too much secretion and cannot be sucked clean at one time, hyperventilation or deep breathing should be performed again and then suctioned.

*The suction tube must reach the depth of the trachea before the aspirator can be activated, or when the aspirator is activated, fold the sputum tube and the glass joint by hand to prevent air leakage, extend the sputum tube into the trachea to a certain depth and then release the suction.

*The negative suction pressure is 6.7kpa (50mmHg).

*During sputum suction, patients often have a cough reflex, which is conducive to expectoration and sputum aspiration.

2.2.2: Turn over

A good way to turn over easily, very practical (copy the link below and access it with a browser, after 3 minutes and 50 seconds of the video)

!<http://v.qq.com/cover/g/g0pyp9zqz7qtxou.html?vid=w0014g60o7f>

It is important for patients who have been bedridden for a long time to turn over in a timely manner. It is generally required to turn over every 2 hours. For some patients, they may need to lie down for more time, and the time to lie on their side is relatively less, which needs to be determined according to the patient's situation.

Generally, long-term bedridden patients use air mattresses to prevent bedsores, so the softness and hardness of the air mattress should be adjusted. Because ALS patients are generally thinner, if the bone tip of the buttocks is separated for a long time, it will be very painful or even broken, so the bone tip should be placed between the gaps of the air cushion to protect it, so that it can lie down. Turn over regularly every day.

2.2.3: Dietary conditioning

Daily diet is very important for patients. Food should not only meet the nutritional needs of patients, but also consider the patient's defecation problem, because the patient has been bedridden for a long

time and the gastrointestinal function has declined, so it is necessary to choose nutritious and digestible food.

Nasal feeding or gastrostomy is more delicious. Conditional regular infusion of albumin.

Benefits of taking coenzymes in people with ALS

Generally, ALS families have oximeters to detect blood oxygen and heart rate. Patients in the middle and advanced stages generally have a fast heart rate, why? With the development of the disease, respiratory function declines, in order to ensure the normal value of blood oxygen, the heart will work faster than normal people, resulting in a heavy burden on the heart and a high heart rate, so protect the heart, usually eat CoQ10, there are many benefits. For ALS people, eat one tablet a day (frequency). I ate as shown in the picture, one capsule with 200 contents, one pill a day, a bottle of 140 grains, which could be eaten for more than four months, and my American classmates mailed it to me. After being in the group for so long, I have also seen several patients who have had a heart attack and left. Everyone, work hard, take good care of yourself, and wait for scientific and technological breakthroughs. Friendly reminder, coenzymes are large, swallow is not good, squeeze out and get into the food to eat, the direct wall breaker of gastrostomy is broken and eaten or squeezed out into the flowing food, do not eat directly if you are not good at swallowing, it is easy to get stuck.

2.2.4: Communication

With the development of the disease, the speech function of ALS patients is gradually lost, so it is necessary to establish an effective communication method between the patient and his family or caregivers according to the situation before the loss of language function. This is very important, we can't look at the ceiling every day, think wildly, think about how difficult our illness is every day, enrich our own lives, and improve our quality of life. I just changed to a new nurse, he didn't understand anything at first, I trained him with an eye control computer, and now his nursing skills basically meet my nursing requirements. Unable to speak after breathing. Some medulla oblongata patients can still write in their hands after pneumotomy, but they will gradually be unable to write. Those who can type use eye controllers, and those who can't type use communication cards or find a communication method that suits them. It can be said that ALS people have a normal IQ, and it is very painful to be unable to communicate and express, and they will also be depressed over time.

Some common sense <http://www.alshome.com/thread-14237-1-1.html>
eye control devices

2.2.5 Prevention of local infection:

The endotracheal cannula is cleaned and disinfected every 2-3 times, and the outer cannula can generally be removed and replaced and disinfected after the tracheal incision forms a sinus tract 1 week after surgery. The gauze of the endotracheal tube should be kept clean and dry, and changed daily. The skin around the wound is often checked for infection or eczema. The catheter is first soaked in 0.5% Xinjierme, then boiled and sterilized, rinsed with clean water and boiled and disinfected. The serpentine tube is soaked in 0.5% Neogel and changed daily.

2.2.6 Oral care

Mouth support brushing method and oral ulcer prevention method (oral ointment for mouth ulcers)

A. Most ALS patients are unable to open their mouths for a long time, and a large number of harmful soybeans grow in the mouth, which is very suitable for ulcers, which develop from one ulcer to a piece that cannot be cured for a long time until thick blood flows out. Doctors say that brushing your teeth regularly can prevent mouth ulcers. I asked people to buy mouth openers, hemostats, sterile medical cotton balls, tongue depressors (the tongue depressors I bought were a little soft, and later switched to stainless steel spoon handles), Yunnan Baiyao toothpaste, toothbrushes, absorbent sponges, sea tarpaulins, and cups.

B. Oral care process

Place the above prepared oral care utensils, including half a cup of sterile cotton balls soaked in warm water (about 10 medium cotton balls), in a convenient location. The patient lies on his side and puts a tarpaulin under his cheeks, and then puts an absorbent sponge on top of the tarpaulin to prevent saliva from flowing onto the bed. First brush the outer teeth to brush all around, then put the tongue depressor on the canine position and press down hard to make the mouth open to the appropriate size, and put the mouth opener into the mouth (pay attention to the handle of the mouth opener in the direction of the tip of the nose into the mouth), at this time do not let go of force, immediately rotate the mouth opener 90 degrees, so that the front teeth can be easily placed in the groove of the mouth opener, and pull out the tongue depressor. Then pinch the mouth opener firmly so that the mouth opens to the right size. Just brush your teeth according to our regular brushing method, and you need to brush everything inside and out. After brushing your teeth, use hemostats to clamp the soaked cotton ball and clean the saliva toothpaste in your mouth. Note that if you want to clean more thoroughly, you must follow the steps of brushing your teeth repeatedly, and then clean the

palate and tongue until the mouth is clean. Then place the tongue depressor in the canine position and press down firmly to open the mouth and take out the mouth opener. Since the mouth opener occupies the position of the front teeth when brushing the teeth, the tongue depressor is placed at the canine position and pressed down to open the mouth to clean the front teeth. Finally, use a cotton ball soaked in water to clean the outside of the teeth on both cheeks, and the oral care is over.

2.2.7: Pooping and peeing

Because of the regular and quantitative eating and drinking every day, the urine and stool are basically timed, as for the stool once a few days or depending on the patient's situation, as long as it forms a regularity. Generally, there is a method to learn from when defecating, that is, put a small pillow on the waist, and then stuff the potty with a plastic bag under the buttocks, so that the plastic bag can be thrown away after defecation and keep it clean. Sometimes caregivers are needed to help press their stomach to help with bowel movements. The use of Kaiserol should also be used as needed.

Constipation Take plant constipation medicine, dietary conditioning, Kaiserlu, enema and other means, if you don't solve the constipation problem, the patient is afraid of eating and does not dare to eat more.

2.2.8: Miscellaneous precautions

2.2.8.1: Some patients drool due to loss of swallowing function, and saliva takes more amitriptyline (saliva machine), which can be caught by a container. There is a way to learn from it, that is, to catch saliva with the plastic of a paper cup on both sides of the cheek when lying flat; When lying on your side, you can cut the mouth of the cooking oil pot into small cups according to the height, and its size and angle are just right. So as not to wet the clothes and quilt with saliva.

2.2.8.2: About the nasal feeding gastric tube Sometimes the tube needs to be replaced due to the blockage caused by the food being crushed.

2.2.8.3: Hygiene should be paid attention to and try to create a sterile environment.

2.2.8.4 Beware of obstruction caused by endotracheal tubes: the cause of obstruction is first, the balloon slippage and blockage, and the other is the secretion bonding into scab obstruction. In order to prevent the balloon slippage, attention should be paid to tying the balloon firmly, leading the thread out of the tracheostomy wound, and frequently involving to check whether it is firm and remove the scab in time. In

addition, when changing the catheter for cleaning and disinfection, it prevents the cotton ball yarn strip from being left in the catheter.

2.2.8.5 Adequate humidification: Patients with tracheostomy lose their humidification function and are prone to complications such as airway obstruction, atelectasis and secondary infection. The following methods are often used for humidification:

A Intermittent humidification, 500ml of normal saline plus 120,000 units of gentamicin, slowly inject 2-5ml into the trachea after each aspiration, the total daily amount is about 200ml, or you can use steam inhalers and nebulizers intermittently for humidification;

B Continuous humidification method, slowly drip the humidification solution into the trachea through the scalp needle in the form of infusion, the drop rate is controlled at 4-6 drops per minute, not less than 200ml per day and night, antibiotics or other drugs can be added to the humidification solution as needed.

2.2.9: Emotions

Some patients have a bad mentality after punctation, so they are comforted, and if the effect is not good, the doctor will prescribe psychotropic drugs for adjustment.

2.2.10: Sleep

Can't sleep to find the cause, breathing is uncomfortable ? Phlegm? Hurt? Air beds are not good? If there is no big problem is not sleeping, then take medicine.

2.2.11: Pain relieves itching

Use Amelia for body aches, use incomparable drops (universal ointment) to relieve itching, air bed, turn over more, and massage more. I can't move anywhere after being in bed for a long time. The eye control device is easy to handle, where does it hurt to tell the family? Only the patients who cannot express themselves suffer, and the family members are more bothered.

3. Common complications after tracheostomy

3.1. Detube (need to learn how to deal with out-of-tube):

Often caused by poor fixation, disconnection is a very urgent and serious situation, if not treated in time, suffocation will occur quickly and breathing will stop.

3.2. Bleeding:

It can be caused by incomplete hemostasis during tracheostomy, or damage to the tracheal wall such as catheter compression, irritation, and rough sputum suction. Patients feel pain at the sternal stem or blood in the sputum, and once heavy bleeding occurs, endotracheal intubation compression should be performed immediately to stop the bleeding.

3.3. Subcutaneous emphysema:

It is a more common complication of tracheostomy, and the emphysema site mostly occurs in the neck, and occasionally extends to the chest and head. When subcutaneous emphysema is found, nail violet can be used to draw on the edge of emphysema to mark it to facilitate observation of progression.

3.4. Infection:

It is also a common complication of tracheostomy. It is related to indoor air disinfection, pollution of sputum suction operation and pre-existing conditions.

Lung infections, urinary infections, oral infections.

3.5. Tracheal wall ulcers and perforations:

Inappropriate cannula selection after tracheostomy, or long catheterization time, untimely deflation and decompression of the balloon can all be caused.

3.6. Subglottic granulomas, scarring and stenosis:

Late complications of tracheostomy.

4. Nasal feeding and gastrostomy need to pay attention to problems

4.1 Nasal feeding needs to pay attention to:

4.1.1 The use of an upper nasal feeding tube increases the chance of air leakage during the use of a ventilator.

4.1.2 The food that is pounded into a paste should be made into a thin shape, which is highly demanding, and needs to be filtered to remove the slag (if the slag is not removed, it is easy to block the pipe), and the excessive thickness of the food destroys the coarse fiber structure of the food.

4.1.3. The tube needs to be changed frequently (domestic tube is changed once every 40 days, imported tube is changed once every 3

months), if you do not invite a doctor to come to the door to replace the nasal feeding tube, it is very troublesome to take the patient to the hospital to change the nasal feeding tube (a familiar doctor is required to provide door-to-door tube replacement).

4.2 Gastrostomy needs to be paid attention to:

Balloon tube technology gastroleak use tube priority No. 18 tube > No. 16 tube > No. 15 tube

4.2.1. Preparation before fistula

A. Wall breaker

B. There are two types of food injection devices: one is the food injection device with a conversion head. The second is the food booster for the love of kinship

C. Medical dressing pack (available in pharmacies, cheaper on Taobao)

D. Saliva machine Patients need to lie down after surgery, and patients with a lot of saliva or mucus will always cause wound pain, and a saliva machine can help you solve this problem.

E. Gauze

F. Wheelchair according to the patient's own situation

4.2.2. Postoperative care of fistula (constant temperature kettle)

The patient sits or lies flat at 45 degrees while eating; Before each meal, rinse the fistula with 30ml of warm water, then feed the food, and then rinse the fistula with 30ml of warm water after the beating; After 20 minutes, the patient lies down and rests, and then wipes the exudate from the fistula with a cotton swab dipped in warm water to keep the fistula dry! Maintain your fistula once a week and rinse it with 10ml of vinegar or cola!

4.2.3. Diet after fistula

The diet after leakage is mainly food crushed and injected through the fistula.

First, according to the body's daily calorie needs. Most people don't get enough of it every day. It is easy to have low potassium, low sodium, and low chlorine. However, few people have regular blood tests to avoid ionic disorders. Be sure to add salt to the food. It is best to inject potassium chloride once through the fistula gastric once every 1-2 weeks, 30-40 ml. Add it to food to avoid irritating stomach pain. Add one at a time (frequency).

Second, you can beat chicken cakes with food. Tofu brain. Soy milk. Milk. juice, etc. All kinds of porridge. Crush the fish and add it to the porridge so that it will not block the pipe. The protein structure of fish is similar to that of human protein and is easily absorbed.

4.2.4. Fistula care.

About 20 minutes after each meal, wipe the fistula with a cotton swab dipped in warm water to keep it dry, and only use an iodophor cotton swab to disinfect it when it is inflamed!

4.2.5. Take a bath after fistula

Many patients and family members who have not had a gastrostomy are worried that it is inconvenient to take a bath after a fistula, and they are worried that it is superfluous. Or wrap it in plastic wrap.

4.2.6. Travel and fistula suspension after fistula

After a gastrostomy, there is a tube on the body that stands up and the tube sags, and when lying down, the tube is not fixed. 15. How to fix the fistula tube: wear the folio clothes, put it on the leather sleeve at the end of the tube, and then hang it on the button of the folio clothes! In this way, it is much more convenient. You don't have to worry about hitting the gastric tube and pulling it out, it's also a lot more beautiful.

4.2.7. Selection of food injector

A. Buy the kind of large disposable plastic syringe in the pharmacy or Taobao online, with a conversion head, it is recommended to use 80 ml, Taobao online search for the keyword "food injection device", 80 ml, four to five times is enough, the larger the volume, the less times each feeding is required, the more trouble-free, but the force of pushing when feeding is very large. I use the 80mL one, one can be used for two months, clean it up after each use, don't scald it with hot water, just dry it in the shade, and if you feel that you can't push it, you can wrap the pusher with plastic wrap and apply sesame oil, so that it is more effort-saving to push, and it is very easy to use!

B. The price of the Nian Qin En flow food booster is relatively expensive, and it is also used by patients.

4.2.8. Fistula oral exudate

Some patients have good nutrition, good healing of fistula skin, and basically no leakage! If there is oozing, don't worry, don't be nervous, wipe it every day, disinfect, pay attention to cleanliness, hygiene and dryness. Of course, if there is a large amount of bleeding, then it is time to see a doctor. Of course, if the exudation is strong, you can also first rule out

whether the liquid seepage is the reason for too much feeding each time, too full, the stomach is too bloated, of course, the stomach is easy to ooze out.

4.2.9. Pipe blocking

Don't be nervous, you can use the food injector to pump back first, if you can't pump it, you can inject vinegar or cola, soak for a while, and then pump back again, if you still can't, use a guidewire to pass through, and the above steps are repeated after blocking the pipe! If you feel that the guidewire is soft, you can use the wire, but to disinfect the wire, the wire should not be too sharp to prevent the wire from breaking the tube wall and causing the balloon to leak.

Note: When the pipe is blocked, add the vinegar dripping method. The water in the pipe should be drained first, because there is water in the pipe, and the concentration of vinegar will be reduced, and the effect is not good enough. Due to the blockage of the pipe, there is no water to be pumped out, only pinch the pipe with your hands, slowly from the bottom up, drive out the air in the pipe up again and again, slowly squeeze it out, put some fine dry toilet paper at the mouth of the pipe, so that the water pinched out will be sucked dry, repeat it a few more times, and the water in the pipe will be dealt with. Then, there is basically no water in the tube, but there will be air, and it is impossible to inject dripping vinegar, the method is to pinch the tube with your hand, inject dripping vinegar, and then let go, the dripping vinegar will be naturally sucked into the tube.

4.2.10. Granulation treatment

Method 1: Go to the hospital's special wound clinic for treatment.

Method 2, take 10 grams of fine salt at home, add 100 ml (100 grams) of water, boil and cool, soak and cover the granulation with gauze, and stick a piece of medical waterproof tape on the gauze (so as not to wet the clothes), so that it dehydrates and shrinks it, which is economical! Gauze and that adhesive tape can be bought on Taobao or in pharmacies, very commonly used things, very cheap.

Method 3: Apply absolute alcohol, or soak the cotton cover with anhydrous alcohol for about 10 minutes, once or several times a day.

4.2.11. Stitch removal method

A We wash your hands with soap

B Use iodophor cotton swabs to disinfect the fistula, skin, fixative sheets, scissors, tweezers, etc

C Cut all the threads of the nylon thread with sterilized scissors,

including 4 on the fixing sheet Hold one end of the nylon wire with sterilized tweezers and pull out all the threads

D Disinfect the fistula, skin, and fixation tablets with iodophor

The upper part of the E fixing piece is located at scale 6

The lower part of F is about one cm away from the fistula, and can be inserted into an iodophor swab for cleaning and disinfection

4.2.12. Balloon water change

It is recommended to change the balloon water once a month, wash your hands with soap, disinfect the fistula with iodophor, pump the balloon water with a syringe, and throw it away. Refill with three milliliters of purified water.

4.2.13. Treatment of out-of-tube

If you accidentally disconnect the tube, please stay calm, find a spare tube, apply lubricating oil and insert it along the original fistula, and just fill the balloon with water!

4.2.14. Pipe replacement.

Standard surgery 15Fr, 16Fr folding tube can be replaced after 6 months, can be replaced at home! The method is as follows, prepare the 16 tubes, insert the guidewire into the injection port of the 15 tubes, use the syringe to extract the balloon water, take out the 15 tubes, apply lubricating oil to the 16 tubes and insert along the guidewires, inject water into the balloon, and then gently lift the balloon tubes, when you feel resistance, you can pull out the guidewire, ok! If possible, it is best to replace the 18F leak pipe, which is more convenient to use. The chance of blocking pipes is lower. But a professional must come to your door to replace it.

5. Equipment maintenance

5.1 Philips Wellcome Trilogy 100 Ventilator Maintenance and Precautions

5.1.1. T100 ventilator accessories and pipelines can be cleaned weekly (do not clean the bacterial filter element), can be washed with clean water or warm detergent, and dried in a cool place to use to strictly prevent sun exposure and high-temperature disinfection.

5.1.2. It is recommended to clean the drip cup pipeline and gas shear extension tube every two days to prepare a replacement pipeline. Prepare a white vinegar solution with a ratio of 1:3 to white vinegar and distilled

water, but the actual amount will vary depending on individual needs. Regardless of usage, the ratio of 1:3 must be maintained. After soaking the circuit in this solution for an hour, rinse the circuit thoroughly using tap water.

5.1.3. The bacterial filter needs to be replaced every week, and it must be replaced once the color turns black and the time is not up. Wash the filter cotton once a week and replace it with a new one every two months.

5.1.4. Every 10,000 hours or 2 years (whichever expires first), Philips maintenance personnel are required to conduct performance testing. Every 17,500 hours, a Philips repair staff replaces the motor or fan assembly for full calibration and verification.

5.1.5. T100 also needs to be charged and discharged once a month, and the external battery can be removed and the internal battery can be used up and then the external battery can be reused.

5.1.6. It is recommended to replace the active exhalation valve once every three to six months, and an additional set of spare valves should be used.

5.1.7. Conduct regular internal disinfection (we provide free mail disinfection service twice a year; It is recommended that families bring their own sterilizers to prevent bacterial infection, and regular maintenance can extend the service life of the machine).

5.1.8. It is recommended to contact customer service every two or three months to read the card, you can check the user's recent use, and whether the parameters need to be adjusted.

Special note: The main body of the machine is flooded, and the damage is man-made damage and is not covered by the warranty

5.2 Common sense of coughing up phlegm machine maintenance

The sputum machine needs to be disinfected regularly, keep the sputum machine pipeline clean and replace the filter cotton (disinfect once every 3-5 months, and clean the pipeline once a week or so (every time the sputum is in the pipeline, it needs to be cleaned), according to the use time, the mask is best to be cleaned every time it is used, the filter cotton is cleaned for about 10 days, and the use is used every day, and a piece is replaced in about 2-3 months)

The phlegm machine should be used to prevent it from falling, and there should be no water basin or water bowl next to it during the use of the phlegm machine to avoid the mask falling into the water basin and prevent water ingress

The bacterial filter connecting the pipeline to the machine needs to be replaced regularly, as long as the filter element is black, it should be replaced immediately regardless of the length of use

5.3 Working principle and maintenance of oxygen concentrator

5.3.1 First acquaintance with oxygen concentrator

5.3.1.1. How oxygen concentrators work:

The oxygen concentrator uses the adsorption performance of molecular sieves, and uses a large-displacement oil-free compressor as the power to separate the nitrogen in the air from the oxygen, and finally obtain a high concentration of oxygen. No medication is required.

5.3.1.2. When is oxygen needed?

For ALS patients, blood oxygen needs to be measured regularly every day, normal blood oxygen value is above 95, heart rate is 60-100, when blood oxygen is lower than 95, oxygen needs to be inhaled, oxygen concentrators or oxygen cylinders are prepared in advance. Generally, before and after eating, before and after going to the toilet, and before and after sputum suction, you need to take oxygen in time. ALS patients require oxygen concentrators to be medical machines of more than 5 liters, with an oxygen concentration of 93 or more, and a low oxygen alarm function. (Tips: If the blood oxygen is low and the heart rate is high, most of the phlegm should be dealt with in time)

5.3.1.3. Hazards of hypoxia

Hypoxia symptoms: dizziness, headache, tinnitus, dizziness, weakness in limbs; Or nausea, vomiting, palpitations, shortness of breath, shortness of breath, shortness of breath, rapid and weak heartbeat.

Dangers of hypoxia: such as sleep disorders, mental decline, memory loss, and brain hypoxia for a few seconds, restlessness will occur, and severe hypoxia will cause central inhibition ataxia, confusion, cerebral edema, and even fainting, unconsciousness, which is life-threatening.

5.3.2 Oxygen concentrator maintenance common sense

5.3.2.1 Clean the exterior

Wipe and clean the outside of the case at least 1-2 times a month.

Method: Cut off the power first, and then wipe with a clean and soft slightly damp rag soaked in disinfectant to prevent liquid from seeping into the gaps of the chassis.

5.3.2.2 Clean the filter

A. The filter of the oxygen concentrator should be cleaned once a week and replaced every three to six months.

Cleaning the filter method: first clean with light detergent, and then wash with water. It must be installed on the machine after it is dry.

B. The secondary filter element should be replaced immediately according to the actual use time and environment, if the filter element is black, regardless of the length of use. It is generally recommended to replace it with a new one every 2000 hours. (Disassembly method: open the storage box lid, unscrew the screws, take out the storage box, and unscrew the filter cartridge).

5.3.2.3. Wash the humidification bottle

A. Humidify the water in the bottle, add purified water or distilled water, and change it once every 1-2 days.

B. The humidification bottle should be washed once a week, which can be rinsed with neutral dish soap and then washed with clean water to ensure oxygen hygiene. When cleaning the humidification bottle, pay attention to cleaning the core tube and filter element, and check whether there are blocked foreign objects to ensure smooth oxygen flow. Note: Water droplets in the oxygen connection tube should be drained.

5.3.2.4 Clean the oxygen suction tube

Generally, it should be washed every three days.

After each use of the nasal tip on the oxygen tube, it is best to wipe it with medical alcohol.

It is recommended to replace the oxygen tube every half month to 1 month. Note: The oxygen tube should be kept dry and there should be no water droplets.