

Basic life support of babies and children with a tracheostomy

This demonstration video is to support anyone caring for a child with a tracheostomy. It is intended to support hands on-training, not replace it. The techniques demonstrated must not be practised on healthy babies but on specially designed mannequins.

Basic life support

Basic life support is a sequence of events that needs to be undertaken to initially try and revive a collapsed child. The key points are A, B, C - airway, breathing and circulation. Damage to the brain and vital organs can occur within a few minutes. So if you suspect that a child is breathing inadequately you must be able to assess the need for and start BLS without delay. It is extremely important that you have access to the correct equipment at all times. We recommend that you keep these items in a small trachy case that will accompany your child wherever they are. Equipment varies with different tubes and any specifics and differences will be discussed with you at the time of training. You will be given a chart of the contents of your child's box, a copy of the resuscitation algorithm and a copy of our booklet that all goes to support you in practising and understanding how to manage an emergency. The most common tracheostomy tube we use for children are cuffless tubes, this means they don't have a balloon which we use to support breathing, or protect the lower chest from aspiration. But be reassured that this will be discussed with you at the time of training.

Checking the contents of the box

A tube the same size. If the tube were to occlude or accidentally decannulate this will be used in the first instance to secure the airway. Check that it is the correct size, whether it's a neonatal or paediatric and that it's within its expiry date. A tube smaller in case the stomal opening closes a little. We recommend this backup tube is made of PVC as it is stiffer and will help you insert the tube easier if the stomal opening closes a little. A suction catheter to help guide the tube in. Round ended scissors to cut tapes. Spare tapes. Lubricating jelly.

For home you will also be given Velcro tapes to secure the tubes if you are a lone rescuer. Also a resuscitation valve to facilitate mouth to tracheostomy. Some children may go home with a bag. Finally you will be given a disconnection wedge to facilitate easy removal of any device from the tracheostomy tube, and will be discussed with you during your training.

The 4 'S's

If you suspect the child is breathing inadequately it is important to assess the four 'S's.

Safety - quickly look around the area, look for clues to what may have caused the problem and make sure there are no hazards. If necessary, make the area safe before you approach. Safety in terms of the tracheostomy - it is also important that you have immediate access to the suction equipment and the emergency box, and oxygen as required, so always make sure this is with the child at all times.

Stimulate the baby to establish whether or not they are responsive. Do this by touching them and calling their name. You can also pinch their earlobes, squeeze their shoulders, tickle feet and pinch their nails beds. All of this for up to ten seconds.

If no response, **shout** for help, do not leave the child alone. Call out for assistance to another person as you continue to manage the child. If you are alone it is important that you carry on and manage the tracheostomy and commence basic life support for one minute before summoning for help.

Suction and In-Situ - ensure the patency of the tracheostomy tube by checking it is in the stoma. Sometimes they can pop out and this can be the cause of the breathing difficulties. If this is the case, replace the tube immediately. After suctioning; has this intervention made a difference? Do this by looking to see if there is any breathing effort for up to 10 seconds. If your child has responded and is breathing, attach the Swedish nose or ventilator as normal and continue to monitor. Summon help as required. This can be a common scenario for anyone with a tracheostomy and if you act quickly the situation will resolve without further deterioration or treatment. This is why it is so important that a child with a tracheostomy is supervised and equipment is to hand at all times.

If the tracheostomy tube is blocked

As before, when you have assessed the four 'S's (Safety, Stimulate, Shout for help and Suction and In-situ), in this instance on suction you are unable to pass the suction catheter down the tube suggesting the tracheostomy tube is blocked and the child is having breathing difficulties. You must clear the airway by changing the tracheostomy tube immediately. Open your emergency box where all of your emergency supplies are kept. This again highlights the importance of always having the emergency box with your child in case quick access is required. In this instance, as the tracheostomy is blocked, it will need changing.

Take the spare tracheostomy tube of the same size out of the box. Lubricate the tube using KJ jelly for easier insertion. The child may be distressed at this point so it is important that you support them. You could swaddle or if someone else is available they could hold them. Using the scissors in the box cut the tapes and remove the tapes and dressing. Communicate with your helper ensuring they are ready to remove the blocked tube and you are ready to replace it. If you are alone you will need to change the tracheostomy using the single person technique. This will have been explained to you before discharge from the hospital. Insert the new tube and remove the introducer.

Suction the tracheostomy to the normal length, again to ensure patency and remove any secretions. Before securing the new tube it important to check this intervention has worked by looking, listening, and feeling if that child is breathing. Do this by placing your cheek close to the tracheostomy, listening and feeling for breath and looking down the chest for up to 10 seconds to see if the chest is rising. If the child has responded and is now breathing, secure the tracheostomy and call for help as required. If the baby is not breathing attach the valve or the bag to the tracheostomy and deliver five rescue breaths. This all happens before the tube is secured.

Once you have delivered those breaths, check for signs of life. Look at their colour. Are they moving or breathing? If there are no signs of life you will need to perform chest compressions. While still holding the tube in place, landmark your position for chest compressions. In babies place two fingers approximately a fingers breadth up from the point where the ribs join the sternum. Check to see

you are not over the very end of the sternum. If you are, move your fingers further up the chest. Two fingers or encircling thumbs is the ideal way to give compressions. Deliver 30 compressions at a rate of 100 to 120 beats per minutes at one thirds depth of the chest. An example of this is 1 and 2 and 3 and 4 up to 30 compressions. After delivery of 30 compressions they need to be interspaced with rescue breaths. Now deliver two breaths via the tracheostomy. Just enough breath to see the chest rise and fall. Continue this sequence of 30 compressions to two breaths until they start to show signs of life or until help arrives.

If you are on your own after one minute of BLS you will need to go and call for an ambulance. If it is a baby, pick the baby up and take them to the phone with you. If you have a mobile phone put it on loud speaker and continue BLS. It will be discussed with you if your child needs a bag. This is usually for children needing long term ventilation or if specifically indicated.

Basic Life Support using a bag valve mask

As before, it is imported to assess the four 'S's. Once you are happy that the tracheostomy is patent and in- situ, you must attach the bag to the tracheostomy tube and deliver five rescue breaths. While holding the tube in place, land mark your position for compression, in babies place two fingers approximately a fingers breadth up from the point where the ribs join the sternum. Check to see you are not over the very end of the sternum. If you are move your fingers further up the chest. Two fingers or encircling thumbs is the ideal way to deliver compressions. Deliver 30 compressions at a rate of 100 to 120 beats per minutes at one third depths of the chest. An example of this is 1 and 2 and 3 and 4 up to 30 compressions. After delivery of 30 compressions, they need to be interspaced with rescue breaths. Now deliver two breaths via the bag. Just enough breath to see the chest rise and fall. Continue this sequence of 30 compressions to two breaths until they start to show signs of life or until help arrives.

If you are on your own after one minute of BLS you will need to go and call an ambulance. If it is a baby, pick the baby up and take them to the phone with you. If you have a mobile phone put it on loud speaker and continues BLS. Some elements of child BLS are slightly different and this will be demonstrated in the next video.

Chest compressions in children over one year

For a child two hands clamped and delivering compression through the heel of your hand is the ideal way as long as you keep your arms straight. If you are by yourself, you may have to hold the tube in one hand, and only use one arm to deliver the compressions. If you are not able to deliver compressions and one thirds depth of the chest with one hand, secure the tube with Velcro tapes and use both hands, one on top of the other.

Action to take if the tube fails to go in: insert the smaller size tube

There is a small risk that the stoma will close when the tracheostomy tube is removed. If the tracheostomy tube of the same size doesn't fit you will need to insert the smaller tube, hence why they should be readily available in your emergency box. You now have a tracheostomy tube of half a size smaller in place. Suction the tube to ensure patency. Once you have made this change it is important to asses breathing. If they are not breathing continue BSL as described before.

If you have only managed to place a smaller size tube, please seek medical help as support will be needed to upsize to your child's normal tracheostomy.

Action to take if the tube fails to go in: Seldinger Technique (railroading)

If you are unable to pass the tracheostomy tube of the same size and the tracheostomy tube of half a size smaller, then we must perform the Seldinger Technique - sometimes known as railroading. You do this by inserting the appropriate size suction catheter through the PVC or smaller tracheostomy tube. Insert the suction catheter into the stoma and slowly railroad the tube over the suction catheter into the stoma. Avoid using the silicon tubes as they tend to be too soft to railroad.

Once you have made this change and suction tubing, it is important to assess breathing and as discussed before. If the child or baby is not breathing you must intervene with BLS. If the child or baby is breathing you must secure the trachy tube and seek help, as support will be need to up size to your child's normal tracheostomy. If this doesn't work other options such as mouth to mouth will have been discussed. For hospital staff please access the algorithm to support this.

You will never know when these vital skills will be necessary and by practicing and learning these vital skills you give babies and children the best possible chance of recovering.