PROCEDURE

Emergency airway puncture

An emergency airway puncture creates an opening through the front of the neck so oxygen can reach the lungs.

PURPOSE
Restore oxygen flow when breathing tube placement and ventilation fail

PROCEDURE TYPE
Therapeutic; surgical or needle-based bedside airway access

WHERE IT IS DONE
At bedside, in an ambulance, emergency department, or operating theatre

ANAESTHESIA
None usually; local anaesthesia if time allows

HOW LONG IT TAKES
About 1-5 minutes for airway access

PREPARATION
None possible during a life-threatening airway emergency

RECOVERY
Hospital or intensive care; no driving until medically cleared

MAIN RISKS
Bleeding, misplaced airway, airway injury, lung pressure injury

RESULTS
Immediate confirmation of airflow and improving oxygen levels

Overview

An emergency airway puncture creates a temporary breathing passage through the front of your neck. It is used when air cannot reach your lungs through your mouth or nose and other emergency airway methods have failed.

The opening is usually made through the cricothyroid membrane, a thin area between two pieces of cartilage in the voice box. The medical term for this is cricothyrotomy .

A clinician may make a small surgical opening and insert a breathing tube. In some situations, a large hollow needle or cannula is inserted instead. Oxygen is then delivered through the opening.

This is a last-resort, life-saving procedure. It must be performed quickly, so there may not be

time to discuss consent beforehand. When you cannot consent and delay would threaten your life, emergency treatment may proceed under emergency consent principles.

Why the procedure is performed

An emergency airway puncture is performed when the healthcare team cannot get enough oxygen into your lungs by safer, less invasive methods. This situation is sometimes described as "cannot intubate, cannot oxygenate."

It may be needed after:

The immediate goal is to restore oxygen delivery. The puncture does not treat the underlying reason your airway became blocked. Further treatment is needed once your oxygen level is stable.

- Severe swelling, injury, bleeding, or blockage of the upper airway
- Failed placement of a breathing tube through the mouth or nose
- Failed ventilation with a face mask or a device placed above the voice box
- A serious allergic reaction or another rapidly developing airway emergency

Who should and should not have it

You may need this procedure if you cannot be oxygenated through your natural airway and less invasive emergency methods have not worked. It is not offered as a routine alternative to ordinary breathing tube placement.

If a face mask, airway device, or breathing tube can provide enough oxygen, an emergency neck opening is usually avoided. In a planned procedure, the team may also wake you up and postpone treatment if this can be done safely.

A surgical cricothyrotomy is generally avoided in young, prepubertal children because their airway structures are small and more easily injured. A specialist team may use a needle-based technique or another pediatric emergency airway approach instead.

Severe neck injury, distorted anatomy, previous neck surgery, infection at the puncture site, or a bleeding disorder can make the procedure more difficult and risky. However, these concerns may not prevent it when no other way to provide oxygen is available.

How to prepare

There is usually no time to prepare. You do not need to fast or change your medicines before an unexpected emergency airway puncture.

If the possibility is discussed before surgery because your airway may be difficult to manage, tell the team about blood thinners like warfarin or apixaban , bleeding conditions, allergies, neck surgery, radiation treatment, and previous problems with anaesthesia or breathing tubes.

Follow the treating facility's own instructions first. These instructions take priority over general information, including any advice about fasting or medicines.

What happens during the procedure

The team continues trying to supply oxygen while preparing the front of your neck. If time permits, the skin is cleaned and local anaesthetic is used. You may already be unconscious because of anaesthesia, sedation, or low oxygen levels.

The clinician identifies the cricothyroid membrane by touch or, when practical, with ultrasound. The airway is then opened using one of two main approaches.

With a surgical cricothyrotomy, a small cut is made through the skin and membrane. A short breathing tube is placed directly into the windpipe and connected to an oxygen supply or ventilator.

With a needle cricothyrotomy, a hollow needle and cannula are passed through the membrane. Oxygen may need to be delivered under pressure. This approach may provide less effective removal of carbon dioxide and can cause pressure injury, particularly if air cannot escape through the upper airway.

The team checks for airflow, chest movement, improving oxygen levels, and exhaled carbon dioxide. The tube or cannula is secured while the underlying emergency is treated.

Recovery and what to expect afterward

You will usually be cared for in an operating theatre, emergency department, or intensive care unit. The airway opening is temporary, but how long it remains in place is based on your condition and the type of airway used.

Pain and soreness around the front of your neck are expected. Pain medicine can be given. Tell the team about increasing pain, swelling, or difficulty moving air through the tube.

Eating and drinking are not restarted until your airway and swallowing are considered safe.

Some people need a swallowing assessment, particularly after airway swelling, injury, or prolonged breathing support.

Activity is limited at first because close monitoring is needed. Once the airway is removed and your breathing is stable, activity can usually increase gradually.

You cannot drive home after this procedure. Do not drive until you have recovered from the underlying emergency, are no longer affected by sedating medicines, and have been medically cleared.

Going back to work depends on the airway injury, the treatment that followed, and whether your job involves driving, machinery, heavy effort, or voice use. Your healthcare team will give you an individual plan.

Risks and possible complications

The procedure is performed because not getting oxygen is more dangerous than the procedure itself. Even so, complications can occur.

Important risks include:

Needle-based oxygen delivery can also allow carbon dioxide to build up. Emergency teams monitor breathing and arrange a more secure airway when necessary.

- Failure to enter the windpipe or provide enough oxygen
- Placement of the tube into surrounding tissue instead of the airway
- Bleeding or a collection of blood in the neck
- Injury to the voice box, vocal cords, windpipe, thyroid, or nearby structures
- Air leaking into neck or chest tissues
- Lung collapse or pressure-related lung injury
- Infection
- Scarring that later narrows the airway
- Voice or swallowing problems

Results and follow up

The immediate result is known within moments. The team looks for air movement, chest rise, exhaled carbon dioxide, and an improving oxygen level.

You may have blood tests, a chest X-ray, a camera examination of the airway, or other imaging to check the airway and look for complications. These tests also help identify why the original airway emergency occurred.

Once you are stable, specialists decide whether to remove the emergency airway, replace it with a breathing tube through the mouth, or create a formal tracheostomy. A tracheostomy is a surgically formed opening lower in the windpipe that may be used for longer-term breathing support.

Follow-up may include checks of your breathing, wound healing, voice, and swallowing. Routine follow-up is important even if you feel well because some airway narrowing or voice problems can develop later.

Alternatives

The alternatives are usually attempted before an emergency airway puncture:

Once oxygen cannot be provided by other methods, delaying a front-of-neck airway to repeat unsuccessful attempts can be dangerous.

- Face-mask ventilation: Avoids a neck opening but may not move air past severe swelling or blockage
- Supraglottic airway: A device placed above the voice box is quick to insert but does not bypass every obstruction
- Tracheal intubation: A tube passes through the mouth into the windpipe, but placement may be impossible in a difficult or blocked airway
- Awake airway placement: Can preserve your own breathing during a planned difficult airway procedure, but requires time and cooperation
- Waking you and postponing treatment: May avoid an invasive airway during planned care, but is not an option if oxygen cannot be maintained
- Emergency tracheostomy: Creates an opening lower in the windpipe but usually takes longer and requires more surgical access

When to call your healthcare team

While you are in hospital, staff continuously monitor the airway. After discharge, attend all planned wound, airway, voice, or swallowing appointments. Mild soreness that is improving can usually be discussed at routine follow-up.

Contact your healthcare team promptly for increasing redness, warmth, discharge, fever, worsening neck pain, new hoarseness, noisy breathing, or persistent trouble swallowing.

Call emergency services immediately for:

Do not drive yourself during a breathing emergency.

- Severe or rapidly worsening difficulty breathing
- Rapidly increasing neck swelling
- Heavy bleeding from the wound
- Blue or grey lips, confusion, collapse, or extreme drowsiness

Common questions

Will I be asleep?

You may already be unconscious from anaesthesia, sedation, or the airway emergency. If you are awake and there is enough time, local anaesthetic may be used. Restoring oxygen cannot be delayed when the situation is immediately life-threatening.

Can I drive home?

No. This procedure requires hospital care, usually with close monitoring. You must not drive until you have recovered and your healthcare team has cleared you.

How painful is it?

You may feel pressure or pain if you are conscious. Local anaesthetic is used when time allows. Soreness around the neck opening is common afterward and can be treated with pain medicine.

When will I know if it worked?

The result is assessed immediately. Airflow, chest movement, oxygen levels, and exhaled carbon dioxide show whether the airway is functioning.

Is the opening permanent?

Usually not. An emergency cricothyrotomy is generally a temporary airway. The team may remove it or replace it with another airway once you are stable.

Sources

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