PROCEDURE

Life support

Life support uses medicines, equipment, and procedures to keep vital organs working during critical illness or injury.

PURPOSE
Support breathing, circulation, or organs during critical illness

PROCEDURE TYPE
Therapeutic, usually bedside using medicines, tubes, and machines

WHERE IT IS DONE
At the bedside, intensive care unit, or operating theatre

ANAESTHESIA
Often sedation; none during CPR or profound unconsciousness

HOW LONG IT TAKES
Minutes during resuscitation; hours to weeks for ongoing support

PREPARATION
None in emergencies; care discussions when time allows

RECOVERY
Usually days to months; no driving until medically cleared

MAIN RISKS
Infection, bleeding, blood clots, and treatment-related organ injury

RESULTS
Immediate response, with progress reassessed over hours to days

Overview

Life support is not one single procedure. It is a group of treatments used when the brain, heart, lungs, kidneys, or other vital organs cannot work well enough on their own.

It may include cardiopulmonary resuscitation (CPR), a breathing tube and ventilator, medicines that support blood pressure, dialysis for kidney failure, or extracorporeal membrane oxygenation (ECMO). ECMO circulates blood through a machine that adds oxygen and may also support the heart.

You may need one treatment or several. Some life support is used briefly during surgery or recovery. In critical illness, it may continue for days or weeks while the healthcare team treats the underlying problem and watches for recovery.

Why the procedure is performed

Life support is used to keep oxygen and blood flowing to vital organs while another treatment has time to work or the body recovers. Reasons include cardiac arrest, severe breathing failure, shock, major injury, organ failure, or complications during surgery.

It does not cure the underlying illness by itself. For example, a ventilator supports breathing while antibiotics like amoxicillin or doxycycline treat an infection or while injured lungs heal.

Sometimes life support is used as a time-limited trial. The team provides treatment for an agreed period, then reviews whether it is achieving goals that matter to you.

Who should and should not have it

Life support may be appropriate when organ failure could improve, when it can provide time for a diagnosis or treatment, or when it can support you until another option-such as an organ transplant-is available.

It is not right for everyone. It may be avoided or stopped when:

A decision not to attempt CPR does not automatically mean refusing antibiotics, oxygen, dialysis, or other care. Each treatment should be considered separately.

In an emergency, treatment may begin before your wishes are known. The team will review available records and speak with your healthcare decision-maker or family as soon as possible. Planned invasive treatment may be delayed when there is time to address bleeding risk, clarify your wishes, or consider safer options.

- You have made an informed decision to refuse it
- A valid advance directive applies to the situation
- A do-not-attempt-resuscitation decision applies to CPR
- Treatment cannot achieve an agreed medical goal
- Its likely burdens outweigh the chance of meaningful benefit
- You prefer comfort-focused care rather than invasive treatment

How to prepare

Life support often begins during an emergency, so there may be no time to prepare.

If treatment is planned, the treating facility's own instructions take priority. You may be asked

when you last ate or drank, which medicines you take, and whether you have allergies or previous problems with anaesthesia or sedation. Do not stop blood thinners or other prescribed medicines unless the treating team tells you to.

If possible, bring your advance directive and the contact details of your healthcare decision-maker. Tell the team about goals that are important to you, such as being able to communicate, live independently, or return home.

What happens during the procedure

What happens depends on which organs need support.

During CPR, staff press firmly and repeatedly on the chest to circulate blood. They may give electrical shocks and medicines or place a breathing tube. CPR usually begins immediately, without anaesthesia, because the person is unconscious and has no effective heartbeat.

For mechanical ventilation, a clinician usually places a breathing tube through the mouth into the windpipe. Medicines may make you sleepy and reduce discomfort. A ventilator then moves air into and out of the lungs. Some people instead receive oxygen through a mask or tight-fitting breathing mask.

Medicines that raise blood pressure are usually given through an intravenous line. Dialysis sends blood through a filter to remove waste and extra fluid. ECMO sends blood through an external circuit to add oxygen, remove carbon dioxide, and sometimes help pump blood.

Monitors continuously track measures such as heart rhythm, blood pressure, oxygen level, and urine output. Blood tests and scans help the team adjust treatment.

Recovery and what to expect afterward

Pain and discomfort depend on the treatments used. A breathing tube can cause throat soreness. CPR can leave the chest painful. Lines or surgical access sites may also be tender. Tell staff about pain, anxiety, or breathlessness so these can be treated.

Nutrition may initially be given through a feeding tube or vein. After a breathing tube is removed, swallowing may need to be checked before you eat or drink normally.

Activity usually starts gradually. Bed rest and critical illness can cause marked weakness, so physiotherapy may begin in the intensive care unit. Recovery can take days to months.

Do not drive while taking sedating pain medicines or while weakness, poor concentration, or medical restrictions make driving unsafe. You will usually need medical clearance before

driving again.

Returning to work depends on the illness, treatments, strength, and type of work. Some people need rehabilitation or a gradual return. Sleep problems, distressing memories, low mood, and difficulty concentrating can occur after intensive care and should be discussed at follow-up.

Risks and possible complications

Risks differ between treatments and may also come from the underlying critical illness.

Important possibilities include:

ECMO and dialysis have additional risks related to large tubes, blood-thinning medicines, and changes in blood pressure or body chemistry. The team should explain the risks of the specific support being proposed.

- Infection involving the lungs, bloodstream, urinary tract, or treatment lines
- Bleeding, blood clots, or damage to a blood vessel
- Lung or airway injury from a breathing tube or ventilator
- Rib or breastbone fractures and internal injury from CPR
- Low blood pressure or other side effects from medicines
- Delirium, meaning sudden confusion and altered awareness
- Muscle weakness after prolonged critical illness
- Brain or organ injury if blood flow or oxygen was severely reduced

Results and follow up

Some effects are visible immediately, such as improved oxygen levels, blood pressure, or removal of waste during dialysis. These numbers do not always show whether the underlying illness will recover.

The team reassesses progress over hours and days using examinations, monitoring, blood tests, scans, and attempts to reduce support. Family meetings may be used to discuss what has improved, what remains uncertain, and whether treatment still matches your goals.

After discharge, follow-up may include primary care, specialist review, rehabilitation, medication checks, and support for physical or emotional effects of intensive care.

Alternatives

Alternatives depend on which organ needs support and what treatment goals are realistic.

Ask what each option could achieve, what it cannot achieve, and how it may affect comfort, communication, and the chance of leaving hospital.

- Less invasive breathing support: Oxygen, high-flow oxygen, or mask ventilation avoids a breathing tube but may not provide enough support in severe respiratory failure.
- Treatment without CPR: You may continue to receive active medical treatment while choosing not to have chest compressions or shocks if your heart stops.
- Conservative kidney care: Medicines, diet changes, and symptom treatment avoid dialysis but cannot replace enough kidney function in every situation.
- Standard intensive care instead of ECMO: Ventilation and heart-supporting medicines are less invasive, but they may be insufficient when failure is severe.
- A time-limited trial: Support is started for a defined goal and reviewed if recovery does not occur.
- Comfort-focused care: Medicines, oxygen, nursing care, and emotional support focus on comfort rather than prolonging life. Choosing this does not mean care stops.

When to call your healthcare team

While you are receiving life support, ICU staff monitor you continuously.

After discharge, contact your healthcare team promptly for fever, increasing wound or line-site redness, worsening swelling, new confusion, difficulty eating or drinking, uncontrolled pain, or a clear decline in breathing or strength. These concerns are different from routine follow-up appointments.

Call emergency services for severe trouble breathing, blue or grey lips, fainting, new severe chest pain, uncontrolled bleeding, or signs of a stroke such as sudden facial drooping, arm weakness, or speech difficulty.

Common questions

Will I be asleep?

You may receive sedation during ventilation, ECMO, or other invasive treatments. Sedation may be reduced when safe so the team can assess you. CPR is usually performed when a

person is already unconscious.

Can I drive home afterward?

Life support is not normally a same-day treatment. If you recover and leave hospital, do not drive until the team says it is safe based on your strength, concentration, medicines, and local rules.

How painful is life support?

Some parts can cause discomfort, including breathing tubes, CPR, suctioning, and access lines. Pain relief and sedation are used when appropriate. Staff also look for signs of discomfort when you cannot speak.

When will I know whether it is working?

Changes in oxygen level, blood pressure, and organ function may appear within minutes or hours. Whether the underlying illness will recover may take days or longer to assess.

Can life support be stopped once it has started?

Yes. Treatment can be withdrawn when you or your decision-maker refuses it, when it no longer achieves its intended goal, or when its burdens outweigh likely benefits. Comfort treatment continues before, during, and after withdrawal.

Sources

- American Heart Association - CPR and ECC Guidelines
- National Heart, Lung, and Blood Institute - Ventilator/Ventilator Support
- National Institute of Diabetes and Digestive and Kidney Diseases - Hemodialysis
- Extracorporeal Life Support Organization - ELSO Guidelines
- Kon AA, Davidson JE, Morrison W, Danis M, White DB. Shared decision making in ICUs: an American College of Critical Care Medicine and American Thoracic Society policy statement. Critical Care Medicine . 2016;44(1):188-201.
- MedlinePlus - Advance Directives