PROCEDURE

CPR - young child

CPR uses chest compressions and rescue breaths to circulate blood and oxygen during cardiac arrest in a young child.

PURPOSE
Maintain blood and oxygen flow during cardiac arrest

PROCEDURE TYPE
Therapeutic - bedside chest compressions and rescue breaths

WHERE IT IS DONE
At the bedside or wherever collapse occurs

ANAESTHESIA
None

HOW LONG IT TAKES
Minutes to tens of minutes, guided by response and professionals

PREPARATION
Check safety, call emergency services, get an AED

RECOVERY
Emergency hospital care; no driving restriction applies to the child

MAIN RISKS
Rib injury, lung injury, vomiting, aspiration

RESULTS
Immediate response signs; hospital tests may identify the cause

Overview

Cardiopulmonary resuscitation, or CPR, is an emergency procedure for a child who is unresponsive and not breathing normally. It combines chest compressions with rescue breaths to move blood and oxygen around the body.

This guidance applies from about age 1 year until the first signs of puberty. Infant and adult CPR use somewhat different techniques. If you are unsure of the child's age group, giving CPR is more important than choosing the perfect technique.

Cardiac arrest means the heart is no longer pumping blood effectively. Gasping, irregular snorting or occasional breaths are not normal breathing.

CPR does not usually restart the heart by itself. It supports the brain and other organs until an

automated external defibrillator, or AED, and advanced medical treatment are available.

Why the procedure is performed

CPR is performed when a child:

In children, cardiac arrest often follows a breathing emergency, although there are many possible circumstances. Rescue breaths are therefore an important part of child CPR.

CPR may also be needed when a choking child becomes unresponsive. In that situation, begin CPR and look in the mouth before giving breaths. Remove an object only if you can clearly see and easily reach it. Do not perform a blind finger sweep.

- Does not respond when spoken to or gently touched
- Is not breathing normally, or is only gasping
- Has no signs of circulation, as assessed by a trained professional

Who should and should not have it

Start CPR for an unresponsive child who is not breathing normally. A member of the public should not spend time trying to find a pulse because this can be difficult and may delay compressions.

Do not give CPR to a child who is awake, responding or breathing normally. If the child is unconscious but breathing normally, place them on their side if it is safe to do so, call emergency services and watch their breathing closely.

Do not enter an unsafe area, such as moving traffic, deep water, fire or an area with electrical danger. Move the child only when needed for safety or to place them on a firm, flat surface.

A documented decision not to attempt CPR may apply to a child with a serious medical condition. Follow the child's emergency care plan if it is immediately available and clearly applies. If there is uncertainty, call emergency services and follow the dispatcher's instructions.

CPR does not require formal consent during a life-threatening emergency when the child cannot consent and a parent or guardian is unavailable.

How to prepare

CPR is not a planned procedure, so there is usually no medical preparation. If possible, take an accredited first-aid course and learn where AEDs are kept at the child's home, school or activity centre.

During an emergency:

If you are alone and have a mobile phone, call on speakerphone while beginning CPR. Follow the emergency dispatcher's directions.

If you must leave an unwitnessed collapsed child to reach a phone or AED, give about two minutes of CPR first. If you saw the child suddenly collapse, activate emergency services and get an AED as quickly as possible.

Instructions from the emergency dispatcher and treating facility take priority over this general information.

- Make sure the area is safe
- Check whether the child responds
- Check breathing for no more than 10 seconds
- Call your local emergency number and use speakerphone
- Ask someone to bring an AED
- Place the child on their back on a firm, flat surface

What happens during the procedure

Kneel beside the child. Place the heel of one hand on the lower half of the breastbone, in the centre of the chest. Use one or two hands according to the child's size and your strength. Keep pressure away from the bottom tip of the breastbone and the ribs.

Give 30 chest compressions:

After 30 compressions, open the airway with a head tilt and chin lift. Pinch the child's nose closed, seal your mouth over their mouth and give two breaths. Each breath should take about one second and make the chest visibly rise.

Continue cycles of 30 compressions and two breaths. When two trained rescuers are providing child CPR, they generally use 15 compressions followed by two breaths.

Use an AED as soon as it arrives. Turn it on and follow its spoken or visual instructions. Use child pads or a child setting when available for a smaller child. If these are unavailable, use standard adult pads. Make sure the pads do not touch each other.

Do not touch the child while the AED analyses the heart rhythm or delivers a shock. Restart

CPR immediately when instructed.

Continue until the child breathes normally, shows clear signs of life, trained professionals take over, the scene becomes unsafe or you are physically unable to continue.

- Press at a rate of 100 to 120 compressions each minute
- Compress the chest by about one-third of its depth, around 5 centimetres
- Allow the chest to return fully after each compression
- Keep pauses as short as possible

Recovery and what to expect afterward

A child who has received CPR needs urgent medical assessment, even if they wake up and appear to recover.

Pain: If the child regains consciousness, their chest may feel sore from compressions. Hospital staff will assess pain and look for injuries. Pain should not be a reason to withhold effective CPR during cardiac arrest.

Eating: Do not give food or drink immediately after resuscitation unless the treating team says it is safe. The child may need tests, sedation or another procedure, and swallowing may not yet be safe.

Activity: Activity is usually restricted until the medical team understands what happened and assesses the child's heart, breathing and neurological function. Recovery may involve hospital monitoring, rehabilitation or gradual return to normal activity.

Driving: A young child does not drive. Do not plan to drive the child home directly after CPR; emergency transport and hospital assessment are normally required. Caregivers should avoid driving if they are distressed or unable to concentrate safely.

School and work: Return to school, childcare, sport and a caregiver's work schedule will be based on the child's recovery and the reason CPR was needed. The treating team should provide an individual plan.

Risks and possible complications

Forceful chest compressions can cause bruising, chest soreness or rib injuries. Less commonly, there may be injury to the breastbone, lungs or internal organs. Vomiting can occur, creating a risk that stomach contents enter the lungs.

Rescue breaths can carry a small risk of infection exposure. A CPR face shield or mask may reduce direct contact, but searching for one should not delay care.

CPR can be physically and emotionally difficult for rescuers. Emergency dispatchers can coach you, and another person can take over compressions if you become tired.

These risks must be weighed against the immediate danger of cardiac arrest. When a child is unresponsive and not breathing normally, starting CPR promptly offers a better chance of survival than waiting.

Results and follow up

Signs that CPR may be working include normal breathing, movement, coughing or waking. Stop chest compressions if the child shows clear signs of life, but continue to monitor breathing until professionals take over.

The outcome may not be known immediately. In hospital, the child may need heart monitoring, blood tests, imaging, neurological assessment and other tests to understand what happened and whether organs were affected.

Routine follow-up after discharge may include appointments with the child's primary care clinician and relevant specialists. The child may also need support with concentration, movement, sleep, mood or returning to school.

Parents, siblings and rescuers can be affected emotionally. Follow-up support or counselling may be helpful after a resuscitation event.

Alternatives

There is no equivalent substitute for CPR when a child is in cardiac arrest.

An AED is an essential addition when available, but it does not replace chest compressions and rescue breaths. CPR should continue while the AED is being prepared and whenever the device instructs you to resume.

If you cannot or will not give rescue breaths, compression-only CPR is better than doing nothing. However, it gives up the oxygen supplied by rescue breaths, which is especially important in many childhood emergencies.

Rescue breaths alone are not an appropriate alternative for an unresponsive child when you cannot confirm effective circulation. Trained healthcare professionals may use breaths without compressions in specific situations where a pulse is definitely present.

Choking first aid, such as back blows and abdominal thrusts, is used while a choking child remains responsive. Once the child becomes unresponsive, begin CPR.

When to call your healthcare team

An unresponsive child who is not breathing normally is an emergency. Call your local emergency number immediately, begin CPR and use an AED as soon as possible.

After hospital discharge, call emergency services rather than waiting for a routine appointment if the child:

Contact the child's healthcare team promptly for increasing chest soreness, fever, vomiting, new weakness, unusual sleepiness or changes in behaviour.

Routine follow-up should cover recovery, medicines, activity, school attendance and any further testing. Keep these appointments even if the child seems well.

- Becomes unresponsive, collapses or has abnormal breathing
- Develops severe difficulty breathing
- Has a seizure that does not stop as directed in their care plan
- Develops blue, grey or very pale skin with reduced responsiveness
- Has severe or rapidly worsening chest pain

Common questions

Will my child be asleep during CPR?

CPR is only given when a child is unresponsive. No anaesthetic or sedative is used. If the child wakes, moves normally or begins breathing normally, stop compressions and continue monitoring them.

Can I drive my child home afterward?

No. A child who has needed CPR should receive emergency medical assessment and will usually be transported by ambulance. Follow the hospital's discharge and transport instructions later.

How painful is CPR?

An unresponsive child is not expected to respond normally to pain during cardiac arrest. If they recover, chest bruising or soreness may occur. Effective compressions must be deep enough to circulate blood.

When will I know whether it worked?

You may see an immediate response, such as normal breathing or movement. The child still needs hospital assessment. Some effects and the reason for the arrest may only become clear after testing and observation.

What if I do the compressions incorrectly?

Call emergency services and follow the dispatcher's coaching. Reasonable CPR is better than no CPR. Focus on the centre of the chest, a rate of 100 to 120 compressions each minute, adequate depth and full chest recoil.

Can I use an adult AED on a child?

Yes, if a child setting or child pads are unavailable. Attach the pads as shown and make sure they do not touch. Follow the device's instructions.

Sources

- Topjian AA, Raymond TT, Atkins D, et al. "Part 4: Pediatric Basic and Advanced Life Support: 2020 American Heart Association Guidelines for Cardiopulmonary Resuscitation and Emergency Cardiovascular Care." Circulation . 2020;142(Suppl 2):S469-S523.
- American Heart Association. Pediatric Basic Life Support Algorithm for Healthcare Providers-Single Rescuer . 2020.
- Van de Voorde P, Turner NM, Djakow J, et al. "European Resuscitation Council Guidelines 2021: Paediatric Life Support." Resuscitation . 2021;161:327-387.
- Resuscitation Council UK. Paediatric Basic Life Support Guidelines . 2021.
- International Liaison Committee on Resuscitation. Pediatric Life Support: 2020 International Consensus on Cardiopulmonary Resuscitation and Emergency Cardiovascular Care Science With Treatment Recommendations . 2020.