CPR: What You Need to Know

compassion & choices
Care and Choice at the End of Life

What is CPR?

CPR—cardiopulmonary resuscitation—is an emergency procedure performed when breathing and/or the heart stops (called respiratory or cardiac arrest). CPR is intended to restart breathing and the heart, and deliver oxygen-rich blood to the brain and other vital organs.

During CPR, a healthcare provider repeatedly pushes on the chest with great force to move air into the lungs. A person may also receive a tube passed into the windpipe, electric shocks (called defibrillation) or medicines to restart the heart.

How do I decide whether I would want CPR procedures?

The decision about CPR should be based on your own values and preferences together with the medical facts and options for treatment. Think about what is important to you and talk to family members and friends, and your healthcare team.

Some people are afraid that if they say they don't want any attempts at CPR they won't get the kind of care they should. A decision not to attempt resuscitation applies only to the CPR process.

Ask your healthcare provider the following questions:

- ➔ What is the likelihood I would survive CPR? CPR is less likely to be successful for people who are terminally ill or have severe health problems such as advanced cancer or dementia. Read our Does CPR work? section to learn more.
- ➔ Would my quality of life suffer if I survive? Sometimes CPR is only partly successful. If the person survives, they may suffer damage to the brain or other organs or be permanently dependent on a machine to breathe. This can be particularly true for older adults and the very frail.

What if I Decide Not to Have CPR?

A DNR (do not resuscitate) order is a request not to have CPR (cardiopulmonary resuscitation) if your heart stops or if you stop breathing while you are in a medical facility. An out-of-hospital DNR is for people who do not want resuscitation procedures if they collapse at home or anywhere outside of a medical facility.

In an emergency situation, such as in the event of a sudden collapse, trauma workers, including physicians, nurses and EMTs, are required to do anything and everything to revive patients unless there is a visible DNR document. (Note many states require them to be a certain color so that it will be easy for emergency personnel to identify.) That's why it is important to have a DNR order (also called an "AND" for "Allow Natural Death") in a place where emergency personnel can see it and talk with your healthcare proxy about your wishes.

Does CPR work?

Most people believe CPR usually succeeds.[1] However, data shows that more often than not,

cardiac arrest ends in death and CPR may leave the person with broken bones and severe neurological problems. For a patient with an advanced life-threatening illness who is dying, CPR may be harmful. The procedure may prolong the dying process. The following play a role in the outcome of CPR:

- **Age.** Older adults generally do not fare as well with CPR as younger people. Roughly half of all people who receive CPR die during the procedure. Of those that do survive, about one in six live to be discharged from the hospital (see Table 1). The older you are, the less likely you are to leave the hospital after CPR.

Table 1. CPR Survival to Hospital Discharge by Age

Age	Survival Rate to Discharge from Hospital[2,3,4]
All adults	17%
Ages 70-79	18%
Ages 80-89	15%
Ages 90+	12%

- **Underlying Health Conditions.** People with health conditions—cancer, liver, kidney, or heart problems, stroke and infection—do not fare as well with CPR. Also, people receiving palliative care or hospice care have survival rates after CPR that are similar to that of nursing home residents, 1-2%.

Table 2 lists various health conditions and the likelihood of survival after CPR. The more advanced the health condition, for example advanced cancer, the lower the likelihood of survival. If you are concerned about CPR and the coronavirus, read more on our COVID-19: Understanding Your Options page.

Table 2. CPR Survival Rates by Health Condition

Health Condition	Survival Rate after CPR[5,6]
Cancer	7%
COVID-19	3%
Diabetes	16%
Heart Failure	17%
Liver Failure	7%
Renal Dialysis	14%
Sepsis/Infection	8%
Stroke	11%

- **Location and Timing of CPR.** Roughly 15% or 1 in 6 patients receiving CPR in the hospital may survive to discharge. Nursing homes have the poorest survival rates, just 1 to 2% of people survive after CPR is given.[7]

Survival after CPR is less clear in non-healthcare settings, with rates ranging from 4% to 38%. Certain people, including people in low-income, black, and Hispanic neighborhoods, are less likely to receive CPR from bystanders than people in high-income, white neighborhoods.[8] Women are also less likely to receive CPR if they experience cardiac arrest in a public place.[9]

How long after the person's collapse that CPR is started is also a factor in survival. About half of all people who receive CPR within 3-5 minutes of collapsing will survive. Each minute

beyond that decreases the chance for survival.[10] Less than 5% of people survive if CPR is given 12 minutes after collapse.[11]

What Are the Complications of CPR?

People who receive CPR may end up with a number of health problems afterward.

- Broken Chest Bones. Even when done properly, CPR can cause broken bones in the chest area, particularly among women, older adults and people with smaller frames.[12] One study found that after CPR people experienced:
  - broken ribs: 81%
  - broken breastbone (sternum): 69%
  - separation of ribs from the sternum: 22%[13]
- Neurological Problems. Without normal blood flow, the brain lacks oxygen. Brain damage can begin within 4-6 minutes. Of the roughly 17% of people who survive CPR, two-thirds have good neurological outcomes. The longer oxygen is cut off, the more likely significant brain damage occurs.[14]
- Vomiting and Aspiration. During chest compressions, it is not uncommon for vomiting to occur. Stomach contents can fall into the lungs and cause pneumonia. Lastly, if personnel is also manually ventilating the patient with a bag-mask, air can enter the stomach causing distension and vomiting.
- Other complications, often caused by broken ribs and sternum, include internal bleeding, damaged airways, collapsed lung, cuts of the liver and spleen.[15]

Learn More

From Compassion & Choices

- Plan Your Care Resource Center
- Your Life, Your Priorities
- DNR and POLST Factsheet
- COVID-19 Toolkit

From Other Organizations:

- The Guardian, 2012, How Doctors Choose to Die.

References

1. Ouellette l, Puro A, Weatherhead j, Chassee T, Whalen D, Jones J. Public knowledge and perceptions about cardiopulmonary resuscitation (CPR): Results of a multicenter survey. American Journal of Emergency Medicine 2018;36(10): P1900-1901. Available at: https://www.ajemjournal.com/article/S0735-6757(18)30117-7/fulltext.

2. Peberdy MA, Kaye W, Ornato JP, Larkin GL, Nadkarni V, Mancini ME, et al. Cardiopulmonary resuscitation of adults in the hospital: a report of 14720 cardiac arrests from the National Registry of Cardiopulmonary Resuscitation. Resuscitation. Resuscitation 2003;58;297-308. Available at: https://www.ncbi.nlm.nih.gov/pubmed/12969608.

3. Girotra S, Nallamothu BK, Spertus JA, Li Y, Krumholz. Trends in survival after in-hospital cardiac arrest. New England Journal of Medicine 2012 Nov 15;367(20):1912-20. Available at: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3517894/.

4. van Gijn MS, Frijns D, van de Glind EMM, van Munster BC, Hamaker ME. The chance of survival and the functional outcome after in-hospital cardiopulmonary resuscitation in older people: a systematic review. Age and Ageing 2014;43(4): 456-463. Available at: https://academic.oup.com/ageing/article/43/4/456/2812217.

5. Bruckel JT, Wong SI, Chan PS, Bradley SM, Nallamothu BK. 2017 Aug 1. Patterns of Resuscitation Care and Survival After In-Hospital Cardiac Arrest in Patients With Advanced Cancer. Journal of Oncology Practice 2017 Oct; 13(10): e821–e830. Available at: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5640412/

6. Sehatzadeh S. Cardiopulmonary Resuscitation in Patients With Terminal Illness: An Evidence-Based Analysis. Ontario Health Technology Assessment Series 2014; 14(15): 1–38. Available at: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4552960/ .
7. American Heart Association. Part 3: Adult Basic Life Support. Circulation 22 Mar 2018. 2000;102:I-22-I-59. Available at: https://www.ahajournals.org/doi/full/10.1161/circ.102.suppl_1.i-22.
8. Benjamin EJ, Virani SS, Callaway CW, Chamberlain AM, Chang AR, Cheng S, et al. Heart disease and stroke statistics—2018 update: a report from the American Heart Association.external icon Circulation 2018;137(12): e67-e492. Available at: http://circ.ahajournals.org/content/early/2018/01/30/CIR.0000000000000558.
9. American Heart Association. Who gets CPR from bystanders? Depends if it's a man or woman.external icon 2017. Available at: https://news.heart.org/gets-cpr-bystanders-depends-man-woman/.
10. Cummins RO. From concept to standard-of-care? Review of the clinical experience with automated external defibrillators. Annals of Emergency Medicine.1989; *18*:1269–1275. Available at: https://www.annemergmed.com/article/S0196-0644(89)80257-4/pdf.
11. Weaver WD, Hill D, Fahrenbruch CE, et al. Use of the automatic external defibrillator in the management of out-of-hospital cardiac arrest. N Engl J Med.1988; *319*:661–666. Available at: https://www.nejm.org/doi/full/10.1056/NEJM198809153191101.
12. Scholz KH, Tebbe U, Herrmann C, Wojcik J, Lingen R, Chemnitius JM, et al. Frequency of complications of cardiopulmonary resuscitation after thrombolysis during acute myocardial infarction [see comments]. Am J Cardiol.1992; *69*:724–728.Available at: https://www.ajconline.org/article/0002-9149(92)90494-J/pdf.
13. Kralja E, Podbregarb M, Kejžarc N, Balažica J. Frequency and number of resuscitation related rib and sternum fractures are higher than generally considered. Resuscitation. Aug 2015. 93:136-141. Available at: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4404201/ .
14. Alexa R. Sabedra AR, Kristan J, Raina K, Holm MB, Callaway CW, Guyette FX, et al. Neurocognitive Outcomes Following Successful Resuscitation from Cardiac Arrest. Resuscitation. 2015 May; 90: 67–72. Available at: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4404201/ . 15. Krischer JP, Fine EG, Davis JH, Nagel EL. Complications of cardiac resuscitation. Chest.1987; *92*:287–291. Available at: https://www.sciencedirect.com/science/article/abs/pii/S0012369215434579.