



ANZCOR Guideline 6 – Compressions

Summary

Who does this guideline apply to?

This guideline applies to all persons who are unresponsive and not breathing normally.

Who is the audience for this guideline?

This guideline is for use by bystanders, first aiders or first aid providers, first responders and health professionals.

Recommendations

The Australian and New Zealand Committee on Resuscitation (ANZCOR) make the following recommendations:

1. All rescuers should perform chest compressions for all persons who are unresponsive and not breathing normally.
2. Interruptions to chest compressions should be minimised.
3. Those who are trained and willing to give rescue breaths do so for all persons who are unresponsive and not breathing normally.

Guideline

All rescuers should perform chest compressions for all persons who are unresponsive and not breathing normally (strong recommendation, moderate quality of evidence).⁶ ANZCOR suggests that those who are trained and willing to give rescue breaths do so for all who are in cardiac arrest (weak recommendation, very low quality of evidence).⁶

1 Recognition of the need for Chest Compressions

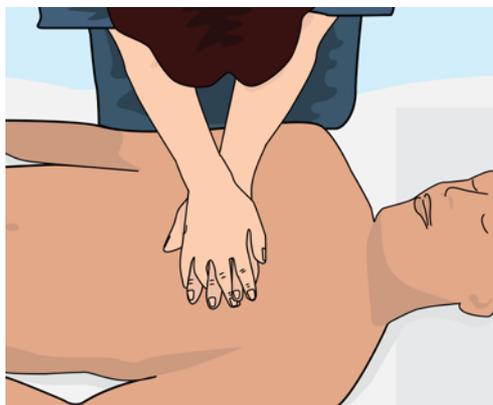
All rescuers, including health care professionals, should use unresponsiveness and absence of normal breathing to identify the need for resuscitation.^{3,6} [Class A; LOE extrapolated evidence] Palpation of a pulse is unreliable and should not be performed to confirm the need for resuscitation.³ [LOE extrapolated evidence]

2 Locating the site for Chest Compressions

ANZCOR suggests performing chest compressions on the lower half of the sternum.⁶ (CoSTR 2015, weak recommendation, very-low-quality evidence). In making this recommendation, we place a high value on consistency with current treatment recommendations in the absence of compelling data suggesting the need to change the recommended approach. [CoSTR 2015 Values and Preferences Statement] Place the heel of their hand in the centre of the chest with the other hand on top (Figure 1).³ [Class A; LOE Expert Consensus Opinion]

Avoid compression beyond the lower limit of the sternum. Compression applied too high is ineffective and if applied too low may cause regurgitation and/or damage to internal organs. [Class A; LOE Expert Consensus Opinion]

Figure 1: Location of chest compressions

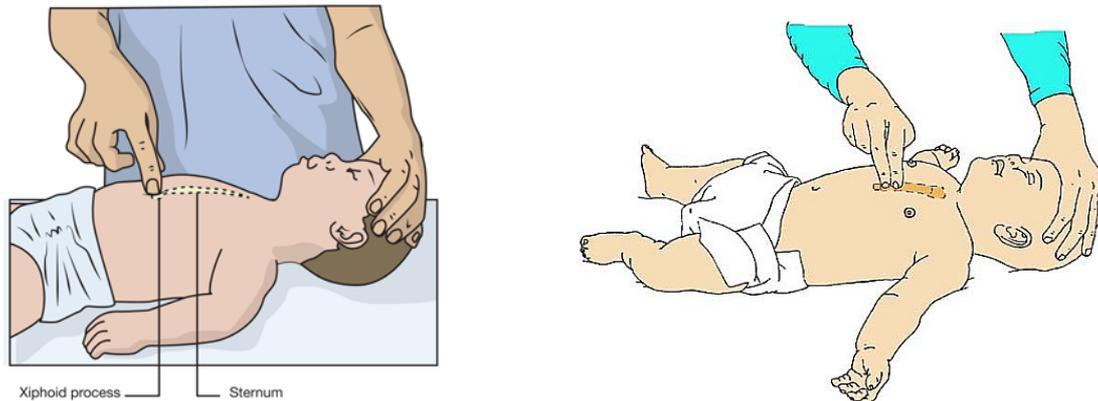


3 Method of Compression

3.1 Infants

In infants the two finger technique should be used by lay rescuers in order to minimise transfer time from compression to ventilation.² Having obtained the compression point the rescuer places two fingers on this point and compresses the chest (Figure 2). [Class A; LOE Expert Consensus Opinion]

Figure 2: Method of compression for infants



(adapted courtesy of European Resuscitation Council)

3.2 Children and Adults

Either a one or two hand technique can be used for performing chest compressions in children (Figure 3).⁴ [Class A; LOE extrapolated evidence]

Figure 3: Administering compressions using one- and two-handed techniques



(adapted courtesy of European Resuscitation Council)

Interruptions to chest compressions must be minimised.³ [Class A; LOE IV, extrapolated evidence] A person requiring chest compressions should be placed on their back on a firm surface (e.g. backboard or floor) before chest compressions to optimize the effectiveness of compressions.^{1,2} Compressions should be rhythmic with equal time for compression and relaxation. The rescuer must avoid either rocking backwards and forwards, or using thumbs or quick jabs. Rescuers should allow complete recoil of the chest after each compression.^{1,2,6}

3.3 Pregnant women

There are no published studies of optimum positioning in pregnant women undergoing cardiopulmonary resuscitation (CPR) so recommendations to date are extrapolated from manikin studies or studies of pregnant women who are not in cardiac arrest. Good quality, uninterrupted chest compressions as described above should be the immediate priority in all pregnant women who are unresponsive and not breathing normally.³ [Class A; LOE II, III-1, III-3]

In noticeably pregnant women, standard CPR should be commenced immediately. Once CPR is in progress, if there are sufficient resources available, rescuers should place padding such as a towel, cushion or similar object under the right hip to tilt the woman's hips (approximately 15-30 degrees) to the left but leave her shoulders flat to enable good quality chest compressions. The reason for this position in pregnant women is to move the weight of the pregnant uterus off of her major blood vessels in the abdomen. If a tilted position is not possible or tilting the hips compromises the quality of chest compressions, then chest compressions should be performed as described as above with the woman on her back.

Figure 4: Padding the noticeably-pregnant woman



4 Depth of Compressions

The lower half of the sternum should be depressed approximately one third of the depth of the chest with each compression. This equates to more than 5cm in adults, approximately 5cm in children^{1,2} and 4 cm in infants.^{1,2} [CoSTR 2015, strong recommendation, low quality evidence]. ANZCOR places greater importance on adequate compression depth. Although there is some evidence suggesting detriment with compression depths greater than 6cm, the clinical reality of being able to tell the difference between 5 or 6 cm and adjust compressions accordingly is questionable. Inadequate compression depth is definitely associated with poor outcomes. ANZCOR has elected not to put an upper limit on compression depth as the risk of too shallow compressions outweighs the risk of compressions that are too deep.² [CoSTR 2015, Values and Preferences Statement]

5 Rate of Compressions

Rescuers should perform chest compressions for all ages at a rate of 100 to 120 compressions per minute (almost 2 compressions/second).² [CoSTR 2015, strong recommendation, very-low-quality evidence] This does not imply that 100 compressions will be delivered each minute since the number will be reduced by interruptions for breaths given by rescue breathing.³ ANZCOR acknowledges that compression rates will vary between and within providers and survival rates are optimised at compressions rates of 100-120 compressions per minute. There is some evidence that compressions rates less than 100 or greater than 140 compressions per minute are associated with lower rates of survival.^{2,4,5} [CoSTR 2015, Values and Preferences Statement]

6 CPR Quality

The compression rate and depth is variable among rescuers and compressions may be worse in the first 5 minutes of the arrest.⁶ One manikin study of rescuer CPR showed that compressions became shallow within one minute, but providers became aware of fatigue only after 5 min.⁷ When performing compressions, if feasible, change rescuers at least every two minutes to prevent rescuer fatigue and deterioration in chest compression quality, particularly depth.^{5,6} [Class B, LOE IV, extrapolated evidence] Changing rescuers performing chest compressions should be done with a minimum of interruptions to compressions.^{5,6}

7 Feedback

There is no high level evidence that the use of CPR feedback devices during real time CPR improves survival or return of spontaneous circulation.² [CoSTR 2015, weak recommendation, very low quality evidence] CPR prompt / feedback devices may be considered for clinical use to provide data as part of an overall strategy to improve quality of CPR at a systems level.^{2,8} [CoSTR 2015, weak recommendation, very low quality evidence] ANZCOR places a higher value on resource allocation and cost effectiveness than widespread implementation of a technology with uncertain effectiveness during real time CPR. We acknowledge that data provided by CPR feedback devices may benefit other victims as part of a broader quality improvement system.² [CoSTR 2015, values and preferences statement]

8 Risks

Rib fractures and other injuries are common but acceptable consequences of CPR given the alternative of death.⁹ [Class A; LOE IV, extrapolated evidence] CPR should be initiated for presumed cardiac arrest without concerns of harm to patients not in cardiac arrest (CoSTR 2015, strong recommendation, very-low-quality evidence).² In making this recommendation, ANZCOR places a higher value on the survival benefit of CPR initiated by laypersons for patients in cardiac arrest against the low risk of injury in patients not in cardiac arrest.²

References

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