GUIDELINE 6

COMPRESSIONS

This guideline is applicable to adults, children and infants.

All rescuers should perform chest compressions in all victims who are unresponsive and not breathing normally.3 [Class A; LOE II, III-1, III-3]

RECOGNITION OF THE NEED FOR CHEST COMPRESSIONS

Lay rescuers and health care professionals should use unresponsiveness and absence of normal breathing to identify the need for resuscitation.3 [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]

LOCATING THE SITE FOR CHEST COMPRESSIONS

There is insufficient evidence for or against a specific hand position for chest compressions during CPR.1 For victims receiving chest compressions, place the hands on the lower half of the sternum.3 [Class A, LOE extrapolated evidence] Rescuers should place the heel of their hand in the centre of the chest with the other hand on top.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]
METHOD OF COMPRESSION

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. [Class A; LOE Expert Consensus Opinion]

![Image of infant compression technique](adapted courtesy of European Resuscitation Council)

Children and Adults
Either a one or two hand technique can be used for performing chest compressions in children.⁴ [Class A; LOE extrapolated evidence]

![Image of child compression technique](adapted courtesy of European Resuscitation Council)

Interruptions to chest compressions must be minimised.³ [Class A; LOE IV, extrapolated evidence] Victims requiring chest compressions should be placed supine on a firm surface (e.g. backboard or floor) before chest compressions to optimize the effectiveness of compressions.¹² Compressions should be rhythmic with equal time for compression and relaxation. The rescuer must avoid either rocking backwards and forwards, or using thumps or quick jabs. Rescuers should allow complete recoil of the chest after each compression.¹²
Pregnant women
There are no published studies of optimum positioning in pregnant women undergoing cardiopulmonary resuscitation 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 victim’s hips slightly (approximately 15-30 degrees) to the left but leave the victim’s 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 the victim’s major blood vessels in the abdomen. If a tilted position is not possible or tilting the victim’s hips compromises the quality of chest compressions, then chest compressions should be performed as described as above with the victim on their back.

DEPTH OF COMPRESSION
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 children3 and 4 cm in infants.4 [Class A; LOE Expert Consensus Opinion]

RATE OF CHEST COMPRESSIONS
Rescuers should perform chest compressions for all ages at a rate of approximately 100 compressions per minute (almost 2 compressions/second).1,2,3 [Class A, LOE IV] 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. [Class A; LOE Expert Consensus Opinion] There is no evidence that a compression rate over 120 / minute offers any advantage. [Class A; Expert Consensus Opinion]
CPR QUALITY

When performing compressions, if feasible, change rescuers at least every two minutes to prevent rescuer fatigue and deterioration in chest compression quality, particularly depth.\(^5\) [Class B, LOE IV, extrapolated evidence] Changing rescuers performing chest compressions should be done with a minimum of interruptions to compressions.\(^5\)

FEEDBACK

CPR prompt / feedback devices may be considered during CPR for laypeople and healthcare professionals.\(^5\) [Class B, LOE III-1, III-2, III-3, extrapolated evidence] CPR prompt / feedback devices may be considered for clinical use as part of an overall strategy to improve quality of CPR.\(^5\) [Class B, LOE III-1, III-2, III-3, extrapolated evidence] However, rescuers should be aware that when the victim is on a soft surface, feedback devices may over-estimate the compression depth. [Class A, extrapolated evidence]

RISKS

Rib fractures and other injuries are common but acceptable consequences of CPR given the alternative of death.\(^5\) [Class A; LOE IV, extrapolated evidence]

REFERENCES