Guidance for safer handling during cardiopulmonary resuscitation in healthcare settings

Working Group of
Resuscitation Council UK

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Contents

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Members of the Working Group

Sara Wright (Chair)	Manual Handling Trainer/Practitioner *
Sally Cassar	Manual Handling Trainer/Practitioner*
Zoë Hayman	Clinical Skills and Simulation Centre Manager
Wayne Hurst	Resuscitation Officer
Sarah Iceton	Manual Handling Trainer/Practitioner*
Ben King	Resuscitation Officer
Melissa Lovell	Manual Handling Trainer/Practitioner*
Sarah Mitchell	Executive Director, Resuscitation Council UK
James Pearson-Jenkins	Registered Nurse and Principal Lecturer; Manual Handling Trainer/Practitioner
Tracey Shepherd	Manual Handling Trainer/Practitioner*
Simon Wells	Manual Handling Trainer/Practitioner
Richard Young	Resuscitation Officer

* Members of the National Back Exchange

Editor

David Pitcher	President, Resuscitation Council UK

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Introduction

This document is a revision of and replaces previous guidance from Resuscitation Council UK published in Guidance for safer handling during resuscitation in hospitals (2001 and 2009). It aims to provide guidance for care providers and resuscitation officers involved in delivery of cardiopulmonary resuscitation (CPR) and for healthcare managers and moving-and-handling practitioners. It relates to the care and treatment of adult patients but may be relevant also to the care and treatment of some children. It cannot provide all the answers and is unable to cover all possible situations. It is not intended to replace the moving-and-handling policies and procedures of hospitals or other healthcare organisations, developed following full local risk assessment. Rather, it is hoped that the principles described in this publication can be used as a resource to support local decisions and policies.

The aims of the Working Group were to:

identify issues of concern

provide reasonable principles and guidance for dealing with moving and handling in the context of attempted CPR, taking into account the absolute urgency of an effective response to cardiorespiratory arrest or impending cardiorespiratory arrest

consider that each healthcare setting will present different situations and challenges

identify principles that will minimise the risk to the rescuer as far as is reasonably practicable

base recommendations on current principles of safer practice.

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Background

Manual handling operations have been defined by the Health and Safety Executive as 'any transporting or supporting of a load (including the lifting, putting down, pushing, pulling, carrying or moving thereof) by hand or by bodily force'.[1]

The main cause for working days lost in 2013 was musculoskeletal disorders (MSD) such as back and neck pain.[2] The total number of working days lost due to MSD in 2013/14 was 8.3 million[3]. General Practitioners identified heavy lifting, keyboard work and manipulating materials as the main risks associated with the development of work- related MSD. Health care had higher rates of MSD compared to the average across industries, and nurses had higher rates of total cases of MSD compared to the average across all occupations.[3]

80% of people experience back pain during their lifetime and as many as 50% of the population will have an episode of back pain in any one year.[4] Poor manual handling accounts for more than 52% of reported incidents of back pain in the health services.[1] Although many back injuries are the result of cumulative stress rather than an isolated incident, careful and safe manual-handling procedures during attempted CPR should be considered and followed at all times.

Cardiorespiratory arrest is probably the most acute medical emergency faced by healthcare providers and speed of response is essential, since any delay in delivering CPR reduces the chance of survival. Resuscitation guidelines emphasise that rescuers should ensure their personal safety and emphasise also that the person delivering chest compressions should change over at intervals of no longer than about two minutes.[5] As part of ensuring their own safety it is important that rescuers avoid placing themselves at risk of an injury that could result from failure to follow the safer-handling techniques referred to in this guidance.

In approximately 80% of adults suffering cardiorespiratory arrest in hospitals there is prior clinical evidence of progressive deterioration.[6] Therefore, cardiorespiratory arrest in hospital is often a foreseeable event. Deteriorating patients and others identified as being at high risk of cardiorespiratory arrest should be assessed:

with a view to prevention of cardiorespiratory arrest if possible

to identify those for whom attempted CPR would not be appropriate

to make plans and provisions to manage the emergency situation safely (including an arrest, should it occur) as far as is reasonably practicable.

For example, patients who are at high risk of cardiorespiratory arrest should be on an appropriate electric profiling bed with a manual override control that will allow the rescuer to flatten the bed surface if the powered functions fail.

In response to the requirements laid down by the Manual Handling Operations Regulations 1992 (MHOR), most hospitals and other healthcare

provider organisations employ manual-handling practitioners and risk assessments are performed for moderate to high-risk events (e.g. patients falling).[1] Manual-handling training is a statutory requirement under the Health and Safety at Work etc. Act 1974 and this requirement is expanded in the Management of Health and Safety at Work Regulations 1992.[7,8] Managers and staff have to consider the working environment and plans should be in place for dealing with identifiable medical emergencies. The principles for moving larger or heavy patients are the same as those for moving people who are smaller or lighter. However, every healthcare provider organisation should have a policy which takes into account the increased risk and the provision of suitable equipment for moving larger or heavy people. Resuscitation guidelines for basic and advanced life support are the same for this group of patients as for others. Their weight and body shape can present difficulties with aspects of CPR including airway management, effective chest compression and defibrillation.

Managing a patient as they collapse to the floor is challenging because of the urgency of the clinical situation, which may distract rescuers from using safer handling techniques. The rapidity of the fall and the potential need for many changes in the posture of the rescuer mean that it is often unrealistic for the rescuer to help lower the patient in a safe manner. Most healthcare provider organisations have local guidance on the management of the falling person.

Before approaching a collapsed patient, attempting to move the patient and/or starting CPR it is important for rescuers to assess rapidly and effectively the risks to themselves and to the patient. Assessing the safety of the rescuer is the first action in the sequence of events in any resuscitation attempt.[5] Before attempting to move a patient, rescuers must take into account their own individual capability, knowledge and experience, and the size and weight of the patient (relative to their own size and strength). Environmental safety factors such as space and lighting must also be assessed rapidly. Care must be taken to avoid injury to the rescuer during attempted CPR as this may prevent them performing effective CPR as well as causing them personal harm. In many clinical settings additional rescuers may be expected to arrive at the scene within a very short time; in some such circumstances it may be more appropriate to wait for help rather than risk personal injury. Any risk of injury must be balanced against the risk of delaying CPR and thereby reducing the chance of a successful outcome.

Low-friction material devices such as slide sheets should be readily available and can offer a safer handling solution in many emergency situations. It is recommended that slide sheets be kept in strategic areas within hospitals and other healthcare settings where their use may be needed. If space permits they should be kept on or next to the resuscitation trolley or at the nearest easily identifiable location. In the community healthcare setting, lone workers should refer to local policies.

Delivering chest compressions is physically demanding but, performed correctly, they can be delivered effectively without causing exhaustion or injury to the rescuer. Another rescuer should take over CPR at least every two minutes to minimise fatigue and optimise the effectiveness of the chest compressions.[5]

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There is a statutory duty under the Provision and Use of Work Equipment Regulations 1998 to train employees in the use of all work equipment and, more specifically, the Lifting Operations and Lifting Equipment Regulations 1998 place a duty on employers to ensure that every lifting operation is planned and prepared properly and carried out by competent persons.[9] Healthcare provider organisations therefore have a responsibility to train employees in lifting and carrying the equipment needed for a resuscitation attempt, including portable defibrillators, and employees have a responsibility to receive the training that is required and to assess and manage the potential risks involved in their work. Employees who are unfamiliar with procedures must seek appropriate training and advice.

This document addresses only those safer-handling techniques and methods that are especially important during attempted CPR. It does not address the manual handling of resuscitation training equipment. This is beyond the scope of this guidance and is a matter that should be addressed in local policies and procedures, following full risk assessment. Similarly, local policies should be established for cardiorespiratory arrest management in specific situations (e.g. MRI scanners and birthing pools).

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Assessing and minimising risk to the rescuer

The MHOR[1] set out a hierarchy of measures that will help people to manage their manual-handling risks:

1. **Avoid harmful manual-handling operations, so far as it is reasonably practicable**

2. **Assess those manual-handling operations that cannot be avoided.**

3. **Reduce the risk of injury so far as it is reasonably practicable.**

It is a statutory duty that an employer must take safety precautions 'so far as is reasonably practicable'. The employer has to weigh up the risks involved in a particular situation or task against the practicality and costs of removing or reducing the risk. To assist with implementation of the above measures the MHOR also uses the acronym TILE(O) to draw attention to situations that may present a risk of injury. These situations are listed in Table 1.

TILE(O) can be applied very rapidly (e.g. in an emergency situation) to make an assessment of risks involved in a specific task but, ideally, most manual handling tasks should be anticipated and their risks assessed more fully in advance, with full involvement of those likely to be involved with the task. Such assessment allows development of plans and procedures, including provision of equipment, for dealing with emergency situations that are likely to arise. Various systems are available for these risk assessments; a good example relevant to CPR, the Rapid Entire Body Assessment (REBA), was chosen for use in this document.

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Table 1. The TILE(O) system for manual handling risk assessment

Task	Does the manual handling task involve: • twisting • stooping • bending • excessive travel • pushing or pulling • precise positioning of the load • sudden movement • inadequate rest or recovery periods • team handling • seated work?
Individual	Does the individual performing the task have adequate strength or stature for the activity? Do they have specialist knowledge or training if this is required? Are they pregnant, disabled or suffering from a health problem?
Load	Is the load: • heavy • unwieldy • difficult to grip • sharp • hot or cold? Are the contents likely to move or shift? (In the case of moving a person) Is the person able to assist or cooperate with the task or likely to resist or otherwise make the task more hazardous?
Environment	Are there: • space constraints • uneven, slippery or unstable surfaces • poorly lit areas • hot, cold or humid conditions • poor ventilation • variations in levels • gusty winds?
(Other factors)	Is movement restricted by clothes or personal protective equipment (PPE)? Is all relevant PPE readily available?

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Table 2. Interpretation of and response to REBA scores		
REBA score	**Risk**	**Action required**
1	Negligible risk	No action needed
2-3	Low risk	Change may be needed
4-7	Medium risk	Warrants investigation and change soon
10-8	High risk	Warrants prompt investigation and change
11-15	Very high risk	Warrants urgent change

REBA is a scoring system (Table 2) designed to assess postures for risk of causing work-related musculoskeletal disorders. The REBA scores shown in the text of this guidance are based on assessment of individuals performing the handling activities described. It is recommended that individual REBA assessments are undertaken to assess the risk of such activities in each individual clinical or care area.

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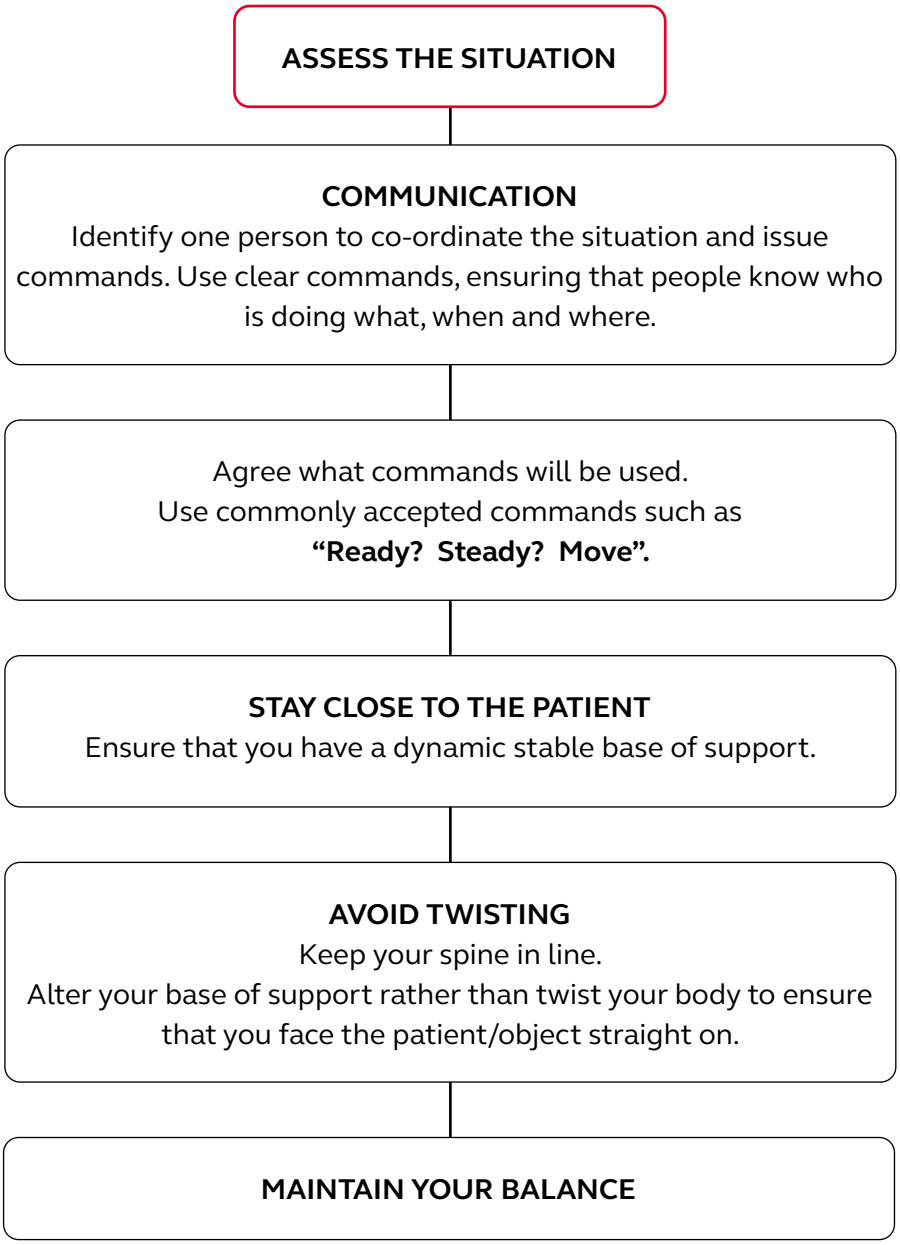
Aide-memoire to safer moving and handling



good posture
spine in line
dynamic stable base
close to load
[REBA score 4]

C-shaped spine
unstable base
reaching and twisting
[REBA score 9]

Figure 1. Examples of good and poor posture when lifting

'Walk stance'
[REBA score 1]

Figure 2. An example of a dynamic stable base

High-kneeling
[REBA score 2]

Half-kneeling
[REBA score 2]

Low-kneeling
[REBA score 2]

Figure 3. Kneeling positions

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Cardiopulmonary resuscitation on the floor

If a patient is found collapsed on the floor and cardiorespiratory arrest is confirmed, carry out CPR on the floor. Start CPR as quickly as possible. Deliver the best quality CPR that is possible in the circumstances, including and especially good-quality chest compressions. Do not try to move the patient unless there is inherent danger to the patient or rescuers in that location.

If the patient has collapsed in a public area such as a waiting room, firstly check safety and then assess for possible cardiorespiratory arrest. If this is confirmed, start CPR without delay. When personnel and facilities allow, consider the use of screens to provide some privacy. Alternatively, ask other patients and members of the public to leave the immediate area.

If access to the patient is restricted move furniture to correct this where possible. If furniture cannot be moved quickly and safely or the restriction to access cannot be relieved slide the patient horizontally across the floor to an area that is less restricted. Use slide sheets to achieve this to reduce risk to the rescuers. Poor access to the patient may result in rescuers having to twist or bend awkwardly. This will impair the quality of CPR and risk potential injury to the rescuer.

Chest compressions

Minimise twisting your spine. Apply force vertically down from your shoulders. This reduces the risk of injury, makes compressions more effective and delays the onset of fatigue.

Kneel in the high-kneeling position with your knees shoulder-width apart at the side of the patient's chest.

Position your shoulders directly above the patient's chest and keep your arms straight. Place your hands in the centre of the patient's chest using the technique described in current resuscitation guidelines.

The force of compressions should come from flexing your hips and extending your knees, not from bending the arms. Compress the sternum to the depth recommended in current resuscitation guidelines.

With hands kept in position, extend your hips and flex your knees again, allowing the chest to recoil to its fullest extent before starting the next compression.

[REBA score 5]
Figure 4. Giving chest compressions to a person on the floor

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Airway management and ventilation

It is important that there is sufficient space around the patient to enable rescuers to manage the airway effectively. Access is required from above the head of the patient, as well as from the side.

Mouth-to-mask ventilation

A pocket mask should be used where there is no access to a bag-valve mask or the individuals are unable to perform this skill.

Kneel behind the patient's head with your knees shoulder-width apart.

Rest back to sit on your heels in the low-kneeling position.

Bend forward from your hips and lean down to blow into the mask.

Consider resting your elbows on your legs for some support.

[REBA score 6]
Figure 5. Mouth-to-mask ventilation of a person on the floor

Bag-mask ventilation

The two-person technique for bag-mask ventilation is preferable when it is possible. Figure 5

Rescuer 1

Kneel behind the patient's head with your knees shoulder-width apart.

Rest back to sit on your heels in the low-kneeling position.

Keep your back as upright as possible and keep your arms straight while holding the mask on the patient's face.

[REBA score 3]
Figure 6. Bag-mask ventilation of a person on the floor

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Rescuer 2

Kneel beside the patient's head with your knees shoulder-width apart.

Rest back to sit on your heels in the low-kneeling position.

Keep your back as upright as possible and keep your arms straight while holding and squeezing the bag to provide effective ventilation.

Airway devices

To insert a supraglottic airway device (e.g. laryngeal mask airway):

Kneel behind the patient's head with your knees shoulder-width apart.

Rest back to sit on your heels in the low-kneeling position.

Place one hand behind the patient's head to keep it tilted back.

During airway insertion lean forward slightly from your hips.

[REBA score 4]
Figure 7. Insertion of a supraglottic airway device in a person on the floor

Tracheal intubation

Kneel behind the patient's head with your knees shoulder-width apart.

You may need to bend forward considerably from the hips in order to see the vocal cords.

Consider resting your elbows on the floor or widening your knees to provide more stability.

Intubation will require considerably more bending forward than using a supraglottic airway device.

Remember that no intubation attempt should interrupt chest compressions for longer than 10 sec and interruptions to chest compression should be kept to a minimum.[5]

[REBA score 7]
Figure 8. Tracheal intubation of a person on the floor

Lifting a patient from the floor following CPR

Current safer-practice guidance suggests that air-assisted (i.e. inflatable) devices are optimal for lifting patients from the floor to another surface. Such an air-assisted device can be used to raise the patient from the floor to bed or trolley height. Keep the patient in a horizontal position during this manoeuvre. Once raised, transfer the patient laterally on to the receiving bed or trolley using appropriate equipment and an adequate number of staff.

Figure 9. Use of an inflatable device to lift a patient from the floor to a bed or trolley

Alternatively, use a hoist with a stretcher attachment that enables direct lifting from the floor, keeping the patient horizontal. If this is not available, use a hoist and sling, as long as this enables direct lifting from the floor and the following criteria are met:

The hoist sling must provide adequate support to the patient's head and trunk.

The hoist sling is inserted underneath the patient using either a log-roll technique or by using slide sheets if the patient is too unstable to be rolled.

During hoisting, care is taken to ensure that the patient's trunk and head remain as horizontal as possible. A good team approach is crucial to ensure the safety and comfort of the patient during this transfer.

If the patient suffers further cardiorespiratory arrest whilst in the hoist, either continue the transfer on to the bed or trolley or lower them back to the floor, depending on which is the safer, quicker or easier.

Always use powered lifting devices when lifting larger or heavy patients.

Try to keep the patient horizontal. A head-down position increases the risk of gastro-oesophageal regurgitation and makes ventilation more difficult.

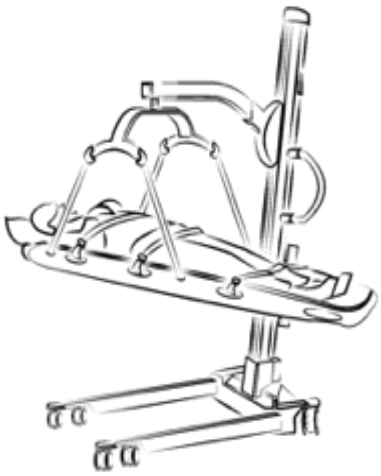

Figure 10. Use of a hoist with a stretcher attachment to lift a patient

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Extra Caution!
The use of the stretcher attachment on a hoist may lower the hoist's Safe Working Load (SWL). Always check the SWL of any attachments and never exceed it.

Manual lift of a patient from the floor

Manual lifts from the floor (especially those within confined areas) are high-risk procedures and should be used only as a last resort.[11] A lift using powered equipment is the safest method for lifting a patient from the floor. However, if a powered transfer cannot be achieved, for example if the patient has collapsed in an area that is inaccessible to a hoist or air-assisted device, a manual lift may be the only option. **All individuals involved must be made aware of the risks associated with this procedure and of the physical abilities that will be required of them.** Determine the safest method; take into consideration the varying heights of the rescuers, the environment and the optimal positioning of the trolley or bed on to which the patient will be lifted. The risks are increased significantly if transferring directly on to a bed because a bed is wider than a trolley. This causes the rescuers to hold the patient further away from their body, increasing the load on their spine.

[REBA score 11]
Figure 11. Manual lifting of a patient from the floor

Adopt the following measures:

Plan the 'transfer' well and ensure that all rescuers are briefed.

Eight people are required (seven to lift and one to position trolley under the patient). Three people position themselves on each side of the patient.

The seventh person gives the commands and co-ordinates the lifting activity; this person is required to support the head. Use a scoop stretcher or a designated lifting sheet (i.e. a sheet that has been designed for lifting).

Log-roll the patient on to the scoop stretcher or lifting sheet.

Each rescuer faces the patient and adopts the half-kneeling position (or a position they feel comfortable in and are able to rise from).

Each rescuer takes hold of the scoop or lifting sheet (using handles if present) with their wrists in a neutral position (Figure 12).

On command, the rescuers stand, lifting the patient to approximately waist height.

The patient is transferred on to an appropriately positioned height-adjustable trolley.

The eighth person positions the trolley under the patient.

If the resuscitation attempt is unsuccessful either an air-assisted device or a hoist must be used to transfer the deceased patient on to a trolley, a bed or directly into a mortuary trolley. If CPR has been undertaken in a restricted space, the deceased patient must be moved to an accessible area using appropriate handling equipment (e.g. slide sheets and pull straps).[12]

Figure 12: Neutral position of the wrist: No flexion, extension or twisting

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Cardiopulmonary resuscitation on a bed or trolley

It is the responsibility of the rescuer to be familiar with all equipment that they may be called upon to use, including beds and trolleys, and it is the employer's responsibility to provide training in manual handling and in the use of equipment. Many handling risks may be eliminated by avoiding poor posture and use of powered equipment in place of actual manual handling.

There are many different types of beds and trolleys available and this document will consider them in two broad categories: those that are electric-powered and those that are operated manually.

To enable delivery of effective CPR, ensure that the patient is supine. A pillow may be used to optimise the patient's head position for laryngoscopy and tracheal intubation.

The following text describes how to move a patient from a semi-reclined position on an electric-powered bed into a supine position to enable CPR to be performed safely and effectively:

Clear any hazards.

Ensure that the bed's brakes are on and, if applicable, lower the bed's side-rails.

If available, use the powered 'CPR' function to achieve the supine position.

If there is no powered 'CPR' function (depends on Make / Model / Specifications) one or two rescuers (according to Make / Model / Specifications) adopt a dynamic stable base position.

With one hand to steady the raised part of the bed and the other to release the marked 'CPR' handle, the rescuers lower the raised part of the bed slowly to a horizontal position.

The following describes how to move a patient from a semi-reclined position on a manually operated bed to a supine position to enable CPR to be performed safely and effectively:

Clear any hazards.

Ensure that the bed's brakes are on and, if applicable, lower the bed's side-rails.

If a slide sheet is in position:

With the bed at approximately hip height, take hold of the top layer of the slide sheet and slide the patient down the bed and away from the backrest until they are supine.

If a slide sheet is readily available:

It may be possible to insert this quickly underneath the patient's hips/buttocks by rolling the patient to one side. Then use the technique outlined above to move the patient down the bed, away from the backrest.

If a slide sheet is not available do NOT use the bed sheet as a slide aid:

Lower the bed to the lowest height possible.

A rescuer stands on each side of the bed, facing the head of the bed and the patient.

Each rescuer places their innermost knee (nearest to the patient) on the bed, keeping their outermost foot on the floor.

The rescuers flex the patient's legs at the knees and hips.

Each rescuer takes hold of the leg closest to them, behind the back of the knee. One hand is placed in the crease of the knee and the other behind the calf.

On command, the rescuers transfer their body weight backwards towards their innermost heels, pulling the patient down the bed and away from the backrest.

Reposition and repeat as necessary.

The combined weight of the rescuers and the patient must not exceed the safe working load of the bed.

Consider readjusting the height of the bed or standing on a firm stool or step provided it is stable. The optimal height places the patient's sternum between the knee and mid-thigh of the person performing chest compressions. (see 'Chest compressions' below)

[REBA score 9]

[REBA score 9]

Figure 13. Sliding a patient down a bed or trolley when no slide sheet is available

In the event that cardiorespiratory arrest and attempted CPR take place on a trolley where there is a manual 'pull-up' backrest, two rescuers are needed to lower the backrest using safer handling principles as follows:

Stand at the head end of the trolley, facing the patient with feet in a walk-stance position.

Push the backrest forward to release the tilting mechanism.

Lift the tilting mechanism and lower backrest in a controlled manner.

[REBA score 5]

Figure 14. Two rescuers lowering a manual backrest on a trolley

Chest compressions

The optimal height of a bed places the patient's sternum between the knee and mid-thigh of the person performing chest compressions. Teamwork is essential; differing heights of rescuers may necessitate adjusting the height of the bed, or use of a stable stool by shorter rescuers. As always, consider the balance of risk to the rescuer against delay in starting chest compressions.

Stand at the side of the bed.

Place your feet shoulder-width apart. Flex forward from your hips.

Ensure that the compression force comes from flexion of your hips and that your shoulders are positioned directly over the patient's sternum.

Slide the patient laterally as necessary towards the rescuer to minimise over-reach. Remember that performing CPR with the patient on a mattress may be less effective and may add significantly to the work for the rescuer, compared to performing compressions with the patient on a more rigid surface.[14,15]

If a patient has a cardiorespiratory arrest on a bed or trolley with limited or no option to adjust its height, a firm stool or step should be provided. This should be of a suitable height to ensure that the rescuer performing chest compressions is able to stand with the level of the patient's sternum between their knee and mid-thigh region. The stool or step should have a non-slip surface and an area large enough for the rescuer to stand with their feet shoulder-width apart. 'Kick stools' are not suitable for this use. Do not try to kneel on a trolley to deliver CPR. This is a high-risk manoeuvre and should be considered only in life-threatening, exceptional circumstances with no alternative option.

[REBA score 5]
Figure 15. Delivery of chest compressions to a patient on a bed

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Airway management and ventilation

Mouth-to-mouth, or mouth-to-mask ventilation (one rescuer):

Stand at the side of the bed, facing the patient, level with their nose and mouth.

Bend forwards from your hips to minimise flexion of the spine.

Support your weight by leaning your legs against the bed frame.

[REBA score 4]
Figure 16. Single rescuer giving mouth-to-mouth or mouth-to-mask ventilation

Intubation and ventilation (with at least two rescuers present):

To intubate the patient, insert a supraglottic airway or to provide mouth-to-mask or bag-mask ventilation (with at least two rescuers present) gain access by moving the head of the bed away from the wall and removing the backrest using standard safer handling techniques.

Position yourself at the head of the bed, facing the patient.

Place your feet in the walk-stance position (Figure 2).

To give mouth-to-mask ventilation or bag-mask ventilation or to insert a tracheal tube or supraglottic airway bend forwards from your hips to minimise flexion of the spine.

Support your weight by leaning your legs against the bed frame.

Once a tracheal tube or supraglottic airway has been inserted adopt a comfortable position and avoid prolonged static postures.

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Cardiorespiratory arrest in a seated patient

To enable you to provide effective chest compressions the patient must be lowered to the floor. This should be carried out in a safe and controlled manner, ensuring that attachments (e.g. drips, drains, catheters, cannulae) are not dislodged. Transferring an unconscious patient from a seat on to the floor places the rescuer(s) at high risk of injury.

The optimal number of people needed to perform this transfer is three. If fewer than three people are available, you may need to attempt a less-than-optimal transfer. Wherever possible, wait for additional people to provide assistance, but the urgency of a cardiorespiratory arrest may not allow this.

In general do not try to transfer a patient directly from a chair to a bed or trolley. A rare exception to this may occur if the patient is already sitting on a sling and a hoist is readily available.

Three-person transfer from chair to floor

Make sure that the chair is secure with any brakes (e.g. on a wheelchair) in the ON position.

If a slide sheet is readily available, place it under the patient's feet and then extend their legs to slide the feet and legs away from the chair as the patient is lowered on to the floor.

One rescuer supports the head by standing at the side of the chair level with the patient's head.

The other two rescuers face the patient in the chair and position themselves slightly in front and to the side of the chair.

These rescuers get into a high-kneeling or half-kneeling position. With their outermost hand (furthest from the patient) they hold the patient at the back of the hip and pelvis, and place their innermost hand behind the knee. If access is restricted around the patient's hip and pelvis, they hold the patient with both hands around the back of the knee.

On the command from one rescuer, each kneeling rescuer transfers their body weight towards their heels. The first stage is to pull the patient forward out of the chair into a sitting position on the floor with their back resting against the chair. The rescuer supporting the patient's head will need to move into a half-kneeling position during this manoeuvre in order to maintain support for the patient's head.

A fourth person may assist by holding the back of the chair, to prevent it moving as the patient is moved out of the chair. This often occurs when the chair has wheels. Even with its brakes on, a chair may slide on smooth floor surfaces.

Once the patient is in a sitting position on the floor **EITHER** move the chair and lower the patient's head and back carefully to the floor **OR** pull the patient's legs forward away from the chair until the patient is lying supine on the floor. One rescuer should support the patient's head at all times. A fourth rescuer can help by moving the chair away when necessary. NOTE: A pillow placed on the floor to cushion the transfer acts as a hindrance rather than a help.

[REBA score 9 for kneeling rescuers]
Figure 17. Position of three rescuers ready to lower a person from chair to floor

[REBA score 9 for kneeling rescuers]
Figure 18. The patient is now seated on the floor; their upper torso must be lowered to the floor with maintained support for the head

Two-person transfer from chair to floor

Both rescuers face the patient in the chair, and position themselves slightly in front and to the side of the chair.

If readily available, place a slide sheet under the patient's feet.

Both rescuers get into a half-kneeling position with their innermost knee (nearest to the patient) on the floor and grasp hold of the patient at the back of the pelvis/hip region with their outermost hand and behind the patient's knee with their innermost hand. Alternatively, use the high-kneeling position, which some rescuers may find more comfortable.

On the command from one rescuer, each kneeling rescuer transfers their body weight back towards their heels. This pulls the patient forwards out of the chair into a sitting position on the floor with their back resting against the chair.

CAUTION: This transfer may occur at speed because of the effect of gravity on the unconscious patient. A pillow placed on the floor to cushion the fall acts as a hindrance rather than a help.

Once the patient is in the sitting position on the floor, one rescuer supports the patient's head, whilst the other pulls the patient's legs forwards and away from the chair or, if there is enough room, moves the chair. Alternatively, one rescuer gently pushes the patient sideways towards the other rescuer who lowers them to the floor.

[REBA score 9]

[REBA score 11]

Figure 19. Two rescuers slide the patient from the chair

One-person transfer from chair to floor

Wherever possible this transfer should not be undertaken by a single rescuer, who should wait for more help to arrive. However, in some situations, after calling for help, a single rescuer may wish to start immediate CPR for which the patient must be moved on to the floor. This is a high-risk manoeuvre and should be undertaken only in life-threatening or exceptional circumstances.[13]

Kneel on the floor to one side of the patient.

Position the patient's arm that is closest to you across their chest and push their trunk away from you.

Push against the patient's lower thigh which is nearest to you with both hands to position the patient's hips towards the front of the chair.

Place one hand behind the patient and around their furthest hip.

Place your other hand on the patient's thigh that is closest to you.

Pull with the hand that is on the hip and push with the hand that is on the thigh to move the patient down to the floor.

[REBA score 12]
Figure 20. A single rescuer pushes the patient's trunk away

[REBA score 12]
Figure 21. A single rescuer pushes against the patient's lower thigh

[REBA score 12]
Figure 22. Position of the patient and rescuer on the floor

NOTE: This technique can be adapted to become a two-person transfer with the second rescuer positioned on the opposite side, pulling the patient's knees towards them with both hands. This may be particularly useful where there is limited space in front of a chair.

[REBA score 9]
Figure 23. Alternative two-person transfer from chair to floor

Cardiorespiratory arrest on a toilet

If a patient has a cardiorespiratory arrest whilst on a toilet they will be likely to fall either sideways or forwards. If the patient remains on the toilet transfer them on to the floor using one or a combination of the above techniques, depending on space constraints. Whilst transferring the patient on to the floor be sure to keep the door open. This will ensure that the entrance is not blocked and will allow other rescuers access to the room. During this transfer care should be taken to avoid trauma to the male genitalia.

Cardiorespiratory arrest in a bath

This is an extremely difficult situation to address because the shape and size of bathrooms vary and access to the patient varies. Any physical technique of removing a collapsed patient from a bath is potentially hazardous and presents a high risk of injury to the rescuer. In most healthcare settings showers have replaced baths in order to allow easier and safer access to personal care for those patients who cannot get into or out of a bath easily. Where a bath is provided a risk assessment must be undertaken (focusing on removal of a patient from the bath in various circumstances that include collapse or cardiorespiratory arrest) to establish guidelines and procedures for staff to manage removal of a patient as safely as is reasonably possible. Risk assessments should also be undertaken and evacuation procedures established for birthing pools.

To allow CPR to be attempted safely and effectively the patient must be removed from the bath. Remove the plug so that the water can begin to drain from the bath before the transfer is started. Water will render the area hazardous for rescuers. Place towels, or other absorbent materials, on the floor before removing the patient from the bath. Before attempting defibrillation ensure that the patient is not lying in a puddle of water or on waterlogged towels and wipe any water from the surface of the chest.

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Cardiorespiratory arrest during hydrotherapy

All organisations providing hydrotherapy should have a policy for evacuating a collapsed patient from the pool and the procedure should be practised regularly. Healthcare organisations offering hydrotherapy should have a clear policy that they do not treat people in hydrotherapy pools unless they have appropriate equipment to evacuate them in an emergency. Many hydrotherapy pools have a ceiling-track hoist installed and use of this is often the preferred method of evacuation from the pool in an emergency.

[REBA score 2]
Figure 24. The rescuer has placed an inflatable support around the patient's neck

The following describes a method for a rapid evacuation from the pool:

Pull the emergency cord to summon help.

Place an inflatable neck support around the patient's neck.

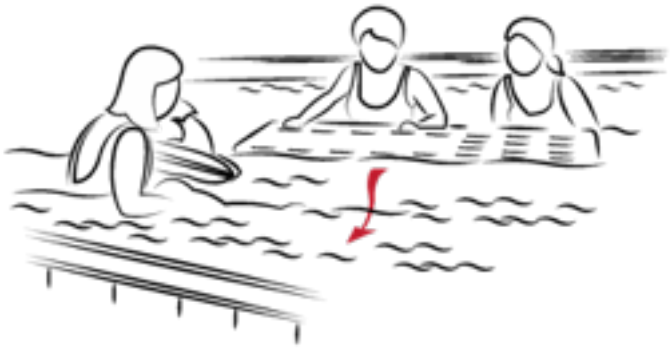
Float the patient to a side of the pool where there is easy access.

The next rescuer to arrive puts an evacuation board into the pool and joins the other rescuer in the water to help to support the patient.

Further rescuers take over supporting the patient from either inside or outside the pool whilst the rescuers in the pool place the evacuation board under the patient.

Secure the patient on to the board with the straps provided.

Position the board so that the head end is at the side of the pool.



[REBA score 2]
Figure 25. Two rescuers prepare to place an evacuation board under the patient

The two rescuers in the water press down on the foot of the board to raise the head end high enough to rest it on the side of the pool.

Then push the board out of the pool (guided by those outside the pool) directly on to the floor if the side of the pool is at floor level or on to a trolley if the pool is above floor level.

NOTE: The weight limit indicated on the evacuation board should not be exceeded. Patients whose weight exceeds the safe limit of the evacuation equipment should not be permitted to use the hydrotherapy pool.

[REBA score 7 for rescuer at the poolside]

Figure 26. Pressing down on the foot of the board to raise the head end on to the side of the pool

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Cardiorespiratory arrest in larger and heavy patients

The principles for moving larger and heavy patients are the same as those already described in this document. Healthcare provider organisations must ensure that suitable equipment is available for moving such patients and that staff are trained in its use. The following additional guidance should be taken into account to facilitate safer moving and handling and effective CPR when a larger or heavy patient suffers cardiorespiratory arrest.

Airway management and ventilation

Airway manoeuvres and maintaining an adequate airway can be difficult because of larger sizes of the head and neck and (in obesity) smaller size of the airway due to a greater volume of parapharyngeal soft tissue. Obese people have a higher risk of gastro-oesophageal regurgitation of gastric contents and resulting aspiration into the lungs.

Raising the head of the bed or trolley slightly may make airway manoeuvres and ventilation easier. However chest compressions may then be less effective and more likely to cause fatigue and possible injury to the person delivering them. If the upper torso is elevated in this way there must be a firm surface underneath the patient's chest.

Chest compressions

When delivering compressions it is important that the rescuer maintains a stable base and minimises the risk of extending their reach. Chest compression quality may be compromised because of the increased physical effort required to achieve the recommended compression depth and rate. Once the airway has been secured chest compressions may be attempted from the head end of the patient if their delivery from the side is proving difficult. If adequate numbers of rescuers are available the person giving chest compressions should change at least every two minutes to reduce fatigue and maintain optimal quality of chest compressions.

Transferring and handling larger or heavy patients

If a larger or heavy patient is on the floor in an area with restricted access and must be moved, either (1) use extra-large (XL) slide sheets under the patient and extension straps or equivalent to pull them into a more accessible area or (2) use an inflatable device if available.

When lifting the patient from the floor following CPR, either use a hoist with an appropriate sling or an inflatable device. If using a hoist and sling, consideration should be given to (1) the safe working loads of the equipment, (2) sling shape in relation to the patient's body shape and weight and (3) the physical effort required by the rescuer to move the hoist with the patient suspended in it. In some situations it may be easier to move a larger or heavy patient by positioning an inflatable device under them and moving them once the device is inflated fully.

The use of hoists with stretcher attachments for larger or heavy patients is often inappropriate as the stretcher attachment may not be wide enough to accommodate their size or may not have a safe working load that will accommodate the patient's weight.

Larger or heavy patients should be cared for on an appropriate electrically operated bed.

Manual lifting of larger or heavy patients is not recommended.[16]

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Conflict-of-interest declaration

Name	Organisation	Conflict of interest
Sara Wright (Chair) Manual Handling Practitioner	Freelance	None
Sally Cassar Manual Handling Practitioner	Freelance and London Borough of Sutton	None
Zoë Hayman Clinical Skills and Simulation Centre Manager / Simulation Educator	Royal Brompton Hospital	None
Sarah Iceton Manual Handling Practitioner	Freelance	None
Ben King Lead Resuscitation Officer	Gloucestershire Hospitals NHS Foundation Trust Gloucester	None
Melissa Lovell Manual Handling Practitioner	Royal Society for the Prevention of Accidents (RoSPA) Birmingham	None
Sarah Mitchell Executive Director, Resuscitation Council UK	Resuscitation Council UK, London	None
James Pearson-Jenkins Registered Nurse and Principal Lecturer; Manual Handling Trainer / Practitioner	School of Health and Wellbeing, University of Wolverhampton	None
Simon Wells Moving and Handling Advisor	Kings College Hospital NHS Foundation Trust	None
Tracey Shepherd Manual Handling Practitioner	Freelance	None
Wayne Hurst Lead Resuscitation Officer	Royal Brompton & Harefield NHS Foundation Trust	None
Richard Young Senior Resuscitation Officer	Royal Marsden NHS Foundation Trust	None

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Resuscitation Council UK	https://www.resus.org.uk
BackCare	https://backcare.org.uk/
Disabled Living Foundation	https://livingmadeeasy.org.uk/
Health and Safety Executive	https://www.hse.gov.uk
National Back Exchange	https://www.nationalbackexchange.org
The Royal College of Nursing	https://www.rcn.org.uk/
The Royal Society for the Prevention of Accidents	https://www.rospa.com