

**CARDIO-PULMONARY RESUSCITATION
COVID-19 (EXCEPTIONAL)
STANDARD OPERATING PROCEDURE**

**Version 2.2
1st May 2020**

Controlled Document

PROCEDURE UPDATE 01/05/2020

U1.0 Summary of Changes

U1.1 Inclusion of Community and Domiciliary Settings at 4.4 & 4.5

U1.2 “Inpatient” has been added at 4.0 – page 5, for clarity.

U1.3 Correction in section 4.1. “clear” changed to “clean”

U1.4 “Mask” has been added at 4.0 – page 6, for clarity.

U2.0 Amendments made to the body of this document are indicated with an asterisk*

SOP - Managing the response to a cardiac arrest in adults and children during the sustained transmission of COVID-19.

1.0 Introduction

1.1 The Resuscitation Council UK have released statements providing guidance for the management of resuscitation in suspected and confirmed Covid-19 patients.

1.2 This supplements guidance available from the Department of Health and Social Care (DHSC) and Public Health England (PHE) as well as Public Health Wales, Health Protection Scotland (HPS) and Department of Health Northern Ireland (DHNI), and may change based on increasing experience in the care of patients with COVID-19, as well as the effect of the outbreak on health services. It is therefore important to always check the latest guidance on the ELFT Intranet/DHSC/PHE/PHW/HPS/DHNI websites.

1.3 COVID-19 is thought to spread in a way similar to seasonal influenza; from person-to-person through close contact and droplets. Standard principles of infection control and droplet precautions are the main control strategies and should be followed rigorously. Aerosol transmission can also occur. Attention to hand hygiene and containment of respiratory secretions produced by coughing and sneezing are the cornerstones of effective infection control.

1.4 All HCWs managing those with suspected or confirmed COVID-19 must follow local and national guidance for infection control and the use of PPE.

1.5 During CPR, there is always the potential for rescuers to be exposed to bodily fluids, and for procedures (e.g. chest compressions, tracheal intubation or ventilation) to generate an infectious aerosol. As such, ELFT has carried out local risk assessments, based on the latest guidance from RCUK/DHSC/PHE regarding PPE for HCWs.

1.6 In-patients which are being treated as suspected or confirmed Covid-19 are not only at the usual risk of deterioration from their clinical condition they potentially run an increased risk of respiratory deterioration due to the viral effects.

1.7 Patients with a COVID-19 like illness, who are at risk of acute deterioration or cardiac arrest, should be identified early (RCUK). The appropriate steps to prevent cardiac arrest and avoid staff exposure to the virus should be taken. The national early warning score should be used (NEWS2) to allow for the early detection of acutely ill patients. A treatment plan (TEP) should be used to plan patients' escalation, in particular the suitability of transferring the patient to an acute Trust to receive level 3 care and invasive ventilation. Decisions relating to 'do not attempt

cardiopulmonary resuscitation' (DNACPR) should also be considered early and where applicable forms should be completed and signed.

2.0 PPE

2.1 Management of both respiratory and cardiac arrest present a risk due to the aerosol generation. Staff must adhere to the guidance for aerosol generating procedures (AGP) and must don the correct PPE prior to entering the isolation area/ room or commencing CPR.

2.2 The **current** minimum PPE requirement to assess **any patient suspected of being in cardiac arrest**, start chest compressions, attach a defibrillator and deliver a shock if required is (in ordering of donning),

- Long-sleeved gown
- FFP3 Mask (Appendix 1)
- Face visor (or goggles)
- Nitrile gloves

2.3 Each ward will be provided a box from the Infection Prevention Control Team, containing 5 full sets of AGP PPE, which is for resuscitation use ONLY. This kit must be stored with/adjacent to the resuscitation bag or trolley and taken to **all cardiac arrests** at the same time as the resuscitation equipment.

2.4 This AGP PPE kit box must be checked daily in conjunction with the daily check of the resuscitation bag or trolley. Missing items MUST be replaced immediately.

2.5 These two films from Public Health England demonstrate the correct procedures for donning and doffing PPE. [Donning video](#). [Doffing video](#) (See appendix 3)

Staff & patient safety is paramount!

3.0 Summary

- Early recognition of patient's deterioration and of patients requiring assisted ventilation is essential to ensure safety and reduce the risk of cardiac arrest.
- Consider safety first – arrest management is aerosol generating
- Do not enter room or attempt CPR without the correct AGP PPE.
- Do not look, listen, feel for breathing with ear close to patients face, and look for the absence of normal breathing and signs of life.

- Feel for a carotid if trained to do so.
- Perform chest compression CPR only
- **Do not use a Bag-Valve-Mask (BVM) or any airway interventions, unless ALL staff either in the room, or within 2 meters of the patient (whichever is the greater), are in full AGP PPE (Appendix 1)**
- Ring (9)999 or 2222 as usual – inform operator **‘PPE is required’**
- Have a PPE buddy, and runner outside room, or 2m away in communal areas, wearing a Fluid Repellent Surgical Mask, apron and gloves.
- Buddy to limit access to room, or enforce a 2m safe distance in communal areas.
- Undertake aerosol generation procedures **only if** full AGP PPE is in place.
- **No stethoscopes-** do not auscultate
- **No PPE-No entry**
- Green MERT/Resus bag/Cardiac arrest trolleys to remain outside the room, or 2m away in communal areas, unless area has a cohort of all confirmed cases.

4.0 *Inpatient staff finding patient: in basic PPE (Fluid Repellent Surgical Mask (FRSM), gloves & apron.

- Shout for help immediately (if in doubt shout/pull PIT/raise alarm)
- Request responders to don full AGP PPE
- Assess the patient
- **Do not** look, listen, feel for breathing with ear close to patient’s face
- Absence of signs of life and normal breathing indicates cardiac arrest. Any doubt, assume cardiac arrest
- Check for a carotid pulse (if trained to do so)
- If no additional staff to call (9)999 or 2222, exit safely to place (9)999 or 2222 call-state: **“PPE required”**
- Flatten bed, remove headboard and improve access to patient (where possible).

- **Do not** perform CPR
- **Do not** perform mouth to mouth
- **Do not** use a pocket mask device
- **Do not** suction without full AGP PPE
- **Do not** send additional ward staff into the room
- Keep oxygen *mask on patients face if already on
- Immediately attach the defibrillator on arrival, turn oxygen off at source and deliver a shock if indicated.
- **Do not** perform CPR unless in AGP PPE
- Do not attempt BVM, await ambulance or 2222 team
- **No PPE-No entry**

4.1 Ward responders

- Assess the situation, don AGP PPE required to begin chest-compression only CPR
- If HCW finding patient is not in required AGP PPE, identify a PPE buddy to assist with donning AGP PPE
- Ensure (9)999 or 2222 call is placed either by another HCW staff member or by HCW exiting room - inform operator that **“PPE is required”**.
- Allocate a staff member to direct ambulance or 2222 team
- Buddy to ensure ambulance crew or 2222 do not enter without required PPE to their protocol/policy/SOP (check with them).
- Identify internal/external runners for the room. (internal- wearing full AGP PPE with FFP3 mask / external wearing FRSM mask, apron and gloves. Visor/goggles if required)
- 'Clean' runner to ensure resuscitation bag/trolley does not enter the room or remains 2m away in communal areas, unless area has a cohort of all confirmed cases.
- **Do not contaminate *“clean” staff**

- No more than 2 ward staff should enter the room (in AGP PPE) to perform chest compressions whilst awaiting response team/ambulance service/2222 response
- Initial responders in basic PPE must leave the room prior to any Aerosol-Generating Procedures (AGPs) being undertaken (CPR, airway intervention, OP airway, i-Gel, bag-valve-mask (BVM) and/or suction).
- Advanced airway management should be left to the airway specialist team
- 'Clean' runner – request medical notes for arrival of team, stand outside room
- Handover to the response team/ambulance service/2222 responders before they enter the room
- Consider crowd control to limit responders being exposed to risks
- First two responders, in required AGP PPE, to follow BLS sequence (with defibrillation)

4.2 Response Team Members

- Must attend Trust PPE training, donning & doffing, FIT checking
- Attend handover meetings and follow operational guidance
- Promptly and safely attend incident location
- Adhere to location infection control, i.e. full AGP PPE if required (**No PPE-No entry**)
- Confirm allocation of a 'clean' runner
- Assess who is required in room.
- Leave stethoscope, name badge, other 'stuff' outside the room/with allocated 'clean' runner before donning PPE
- Don PPE outside the room or 2m away in communal areas, with an allocated buddy
- If there is no PPE buddy already present, await a colleague to act as buddy
- PPE must be applied prior to entering the room and/or commencing CPR, even if delay to attending patient.

- Check the medical records if necessary prior to entering the room
- Take in any necessary emergency kit / equipment with you when you go into the room
- Do NOT take the resus bag/cardiac arrest trolley into the room unless ward is specifically allocated for a cohort of patients
- If defibrillation is required, the oxygen should be turned off / and the tubing disconnected from the oxygen cylinder to reduce the aerosol risk from the patient's airway.

4.3 ALS management

- If the patient has an oxygen mask in place, leave this on the patients face during compressions as this can help to reduce the aerosol generation.
- Bag-valve-mask ventilation should only be performed by those trained in the technique and a two-person technique should be used to improve the seal. (Reducing aerosol from patient).
- **Do not perform BVM or suction unless all staff are wearing full AGP PPE** (Appendix 1).
- 30:2 should be managed ideally with two team members to reduce the requirement for additional staff, one to seal the mask with two hands the other to perform chest compressions and ventilation (squeezing of the bag).
- Decisions relating to advanced airway and intubation rest with the most senior anaesthetic/critical care clinician.
- No chest auscultation
- Cardiac arrest may be caused directly by COVID-19 or due to a co-existing illness. It is important to attempt to identify and treat any reversible causes, (4 H's & 4 T's – see [ALS Guidelines](#)) e.g. severe hypoxaemia, before considering stopping CPR.
- ABG, VBG & routine bloods samples (where used) must be wiped with an antiviral wipe, placed in a red bag and dropped into another bag (double bag) just outside room, to staff in Fluid Repellent Surgical Mask, gloves, visor/goggles and apron. These should be transferred safely wearing required PPE, by staff from the acute Trust (2222 response only) to a dedicated blood gas analyser.

- Lab bloods that cannot be wiped but must be double bagged and sent to the laboratory for testing as per local guidance.
- Documentation of the incident should occur outside the room. If it is not possible to communicate at the time of patient management, document retrospectively. Clarify key points with the team. Please document names of attendees and job roles.

4.4 *Community and Domiciliary Settings

4.41 It is important to review decisions relating to ‘do not attempt cardiopulmonary resuscitation’ (DNACPR) with key stakeholders on a regular basis. This is to prevent inappropriate and unnecessary resuscitation, which could put staff at risk.

4.42 Staff will carry one set of PPE for Cardio – Pulmonary Resuscitation (CPR), consisting of:

- 1x Long-sleeved gown
- 1x FFP3 Mask (Appendix 1)
- 1x Face visor (or goggles)
- 1x pair Nitrile gloves

4.43 Staff must be FIT tested for their correct FFP3 mask. Please contact your team lead to arrange FIT testing.

4.5 *Community and Domiciliary staff finding a patient:

- Shout for help immediately
- Assess the patient
- **Do not** look, listen, feel for breathing with ear close to patient’s face
- Absence of signs of life and normal breathing indicates cardiac arrest. Any doubt, assume cardiac arrest
- Check for a carotid pulse (if trained to do so)
- If no signs of life, call 999. Remember to state if the patient is suspected or confirmed **COVID-19**

- **Do not** perform CPR until PPE in place.
- Don PPE and perform a FFP3 mask FIT check. (any delay to CPR whilst this is undertaken is acceptable).
- Perform chest-compression only CPR. Do not stop unless patient shows signs of life, it is unsafe to continue, or you become tired (resume if possible)
- **Do not** perform mouth to mouth
- **Do not** use a pocket mask device
- **Do not** suction without full AGP PPE
- Keep oxygen mask on patients face if already on
- If a Public Access Defibrillator is available, immediately attach the defibrillator on arrival, turn oxygen off (if attached) and deliver a shock if indicated.
- **Do not** attempt Bag Valve Mask (BVM), await ambulance crew.

5.0 Aerosol-generating procedures (AGPs)

Aerosols generated by medical procedures are one route for the transmission of the COVID-19 virus. The following procedures associated with CPR are considered to be potentially infectious AGPs: (Please see appendix re PPE)

- Chest compressions
- Intubation, extubation and related procedures
- Tracheotomy/tracheostomy procedures
- Manual ventilation
- Open suctioning
- High flow oxygen

6.0 Return of Spontaneous Circulation (ROSC)

- Provide usual post ROSC care, A to E assessment
- Consider who can be released from room
- Identify which staff are required for transfer (consider who is best to handover the patient)
- Adhere to local Doffing guidance and infection control guidance for transfer.

7.0 Paediatrics

- Please adhere to the guidance above with the following considerations,
- Paediatric cardiac arrest is more likely to be caused by a respiratory problem making ventilations crucial to chances of survival.
- It is vital to act quickly to ensure the child gets the treatment they need in the critical situation and the usual PBLIS guidelines may not be able to be followed in the immediate instance.
- Bag-valve-mask ventilation (BVM) / intubation must be immediately available for any child/infant at risk of deterioration/cardiac arrest. Therefore, it is imperative that urgent transfer to an acute hospital by ambulance or other local arrangement, is undertaken.
- BVM must only be performed by HCW specifically trained in this skill, as it is an aerosol generating procedure (AGP) all present in the room must be wearing full AGP PPE. A two-person technique should be adopted to ensure a good seal.
- In instances where staff finding the child in cardiac arrest (HR<60, not breathing normally, no signs of life), are not in full PPE, chest compressions only should take place until responders in full PPE are in attendance to manage 15:2 CPR ratio in line with usual guidelines.

8.0 Unsuccessful CPR attempts

- Ensure full clear up of equipment, do not leave the room for the ward staff to clear
- Airway equipment should be managed by the airway specialist team to minimise risk to the unskilled staff.
- Ensure full AGP PPE of staff handling the body post arrest, Adhere to usual local guidelines.

9.0 Cleaning up

- Check Police have released the scene (adult inpatient area)
- One member of staff to don entire new PPE to clear away, disposing of used PPE in an orange clinical waste bag.
- Dispose of, or clean, all equipment used during CPR following the manufacturer's recommendations and ELFT guidelines.
- Any work surfaces used for equipment will need to be cleaned in line with infection control guidelines.
- Ensure equipment used for airway (e.g. laryngoscopes, face masks) is not left lying on the patient's pillow, but is instead placed in an orange clinical waste bag.
- If used, carefully place the contaminated end of the Yankauer inside a disposable glove before disposal into the clinical waste bag.

10.0 References

Resuscitation Council (UK):

www.resus.org.uk/media/statements/resuscitation-council-uk-statements-on-covid-19-coronavirus-cpr-and-resuscitation/covid-healthcare/,

www.resus.org.uk/media/statements/resuscitation-council-uk-statements-on-covid-19-coronavirus-cpr-and-resuscitation/covid-paediatrics/

www.resus.org.uk/media/statements/resuscitation-council-uk-statements-on-covid-19-coronavirus-cpr-and-resuscitation/covid-community/

[COVID-19 ALS Algorithm.](#)

Department of Health and Social Care (DHSC), Public Health Wales (PHW), Public Health Agency (PHA) Northern Ireland, Health Protection Scotland (HPS) and Public Health England [COVID-19: Guidance for infection prevention and control in healthcare settings. Version 1.0.](#)

Public Health England, [Guidance, Explanation of the updates to infection prevention and control guidance, Updated 7 April 2020](#)

Donning & Doffing quick reference guides:

https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/874328/PHE_COVID-19_Donning_quick_guide.pdf

https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/874326/PHE_COVID-19_Doffing_quick_guide.pdf

[ELFT CPR COVID-19 Resuscitation Alert](#)

With thanks to:

Lead Resuscitation Officer, Queen Elizabeth Hospital, Norfolk

Resuscitation Lead, East & North Hertfordshire NHS Trust

IMPORTANT: Current guidance may change based on increasing experience in the care of patients with COVID-19, as well as the effect of the outbreak on health services. It is therefore important to always check the latest guidance on the ELFT Intranet and DHSC/PHE/PHW/HPS/DHNI websites.

Appendix 1



Public Health
 England

When to use a **surgical face mask** or **FFP3 respirator**

When caring for patients with **suspected or confirmed COVID-19**, all healthcare workers need to – prior to any patient interaction – assess the infectious risk posed to themselves and wear the appropriate personal protective equipment (PPE) to minimise that risk.

When to use a surgical face mask



In cohorted area (but no patient contact)

For example:

Cleaning the room, equipment cleaning, discharge patient room cleaning, etc

PPE to be worn

- Surgical face mask (along with other designated PPE for cleaning)

Close patient contact (within one metre)

For example:

Providing patient care, direct home care visit, diagnostic imaging, phlebotomy services, physiotherapy, etc

PPE to be worn

- Surgical face mask
- Apron
- Gloves
- Eye protection (if risk of contamination of eyes by splashes or droplets)

When to use an FFP3 respirator



When carrying aerosol generating procedures (AGP) on a patient with possible or confirmed COVID-19

In high risk areas where AGPs are being conducted (eg: ICU)

The AGP list is:

- Intubation, extubation and related procedures such as manual ventilation and open suctioning
- Tracheotomy/tracheostomy procedures (insertion/open suctioning/removal)
- Bronchoscopy
- Surgery and post-mortem procedures involving high-speed devices
- Some dental procedures (such as high-speed drilling)
- Non-Invasive Ventilation (NIV) such as Bi-level Positive Airway Pressure (BiPAP) and Continuous Positive Airway Pressure ventilation (CPAP)
- High-Frequency Oscillating Ventilation (HFOV)
- High Flow Nasal Oxygen (HFNO), also called High Flow Nasal Cannula
- Induction of sputum

PPE to be worn

- FFP3 respirator
- Long sleeved disposable gown
- Gloves
- Disposable eye protection

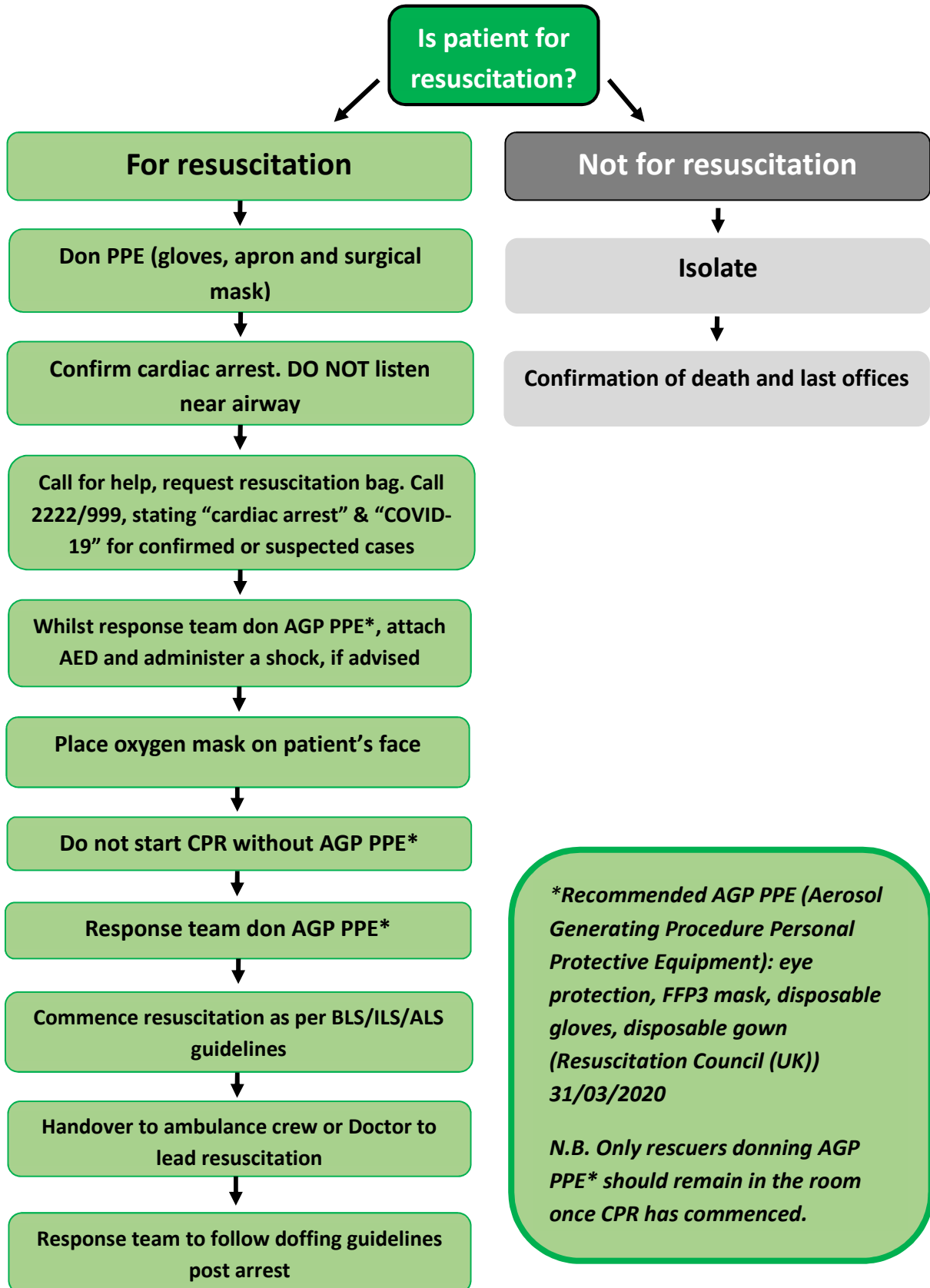
Always fit check the respirator

REMEMBER

- PPE should be put on and removed in an order that minimises the potential for self-contamination
- The order for PPE removal is gloves, hand hygiene apron or gown, eye protection, hand hygiene, surgical face mask or FFP3 respirator, hand hygiene

These images are for illustrative purposes only. Always follow the manufacturer's instructions.

COVID-19 Inpatient Cardiac Arrest Guidance



Appendix 3



Quick guide

COVID-19

Putting on (donning) personal protective equipment (PPE) for aerosol generating procedures (AGPs)

This is undertaken outside the patient's room.

Pre-donning instructions

- ensure healthcare worker hydrated
- tie hair back
- remove jewellery
- check PPE in the correct size is available

Perform hand hygiene before putting on PPE

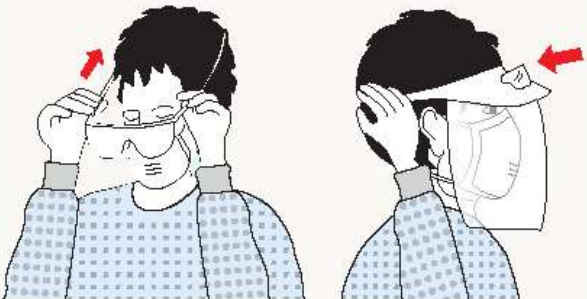
1 Put on the long-sleeved fluid repellent disposable gown



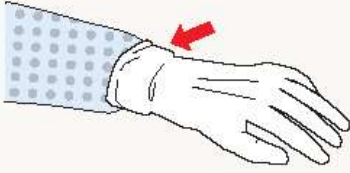
2 Respirator
Perform a fit check.



3 Eye protection



4 Gloves



Quick guide

COVID-19

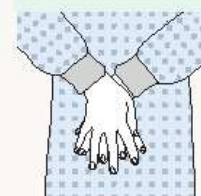
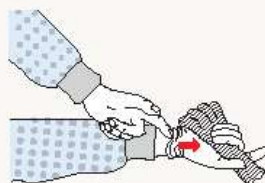
Removal of (doffing) personal protective equipment (PPE) for aerosol generating procedures (AGPs)

PPE should be removed in an order that minimises the potential for cross contamination.

The order of removal of PPE is as follows:

1

Gloves –
the outsides of the gloves are contaminated



Clean hands with alcohol gel

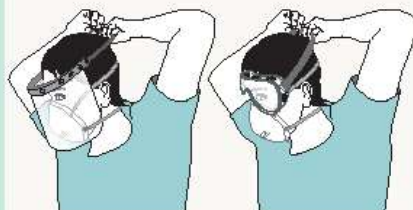
2

Gown –
the front of the gown and sleeves will be contaminated



3

Eye protection -
the outside will be contaminated



4

Respirator

Clean hands with alcohol hand rub. Do not touch the front of the respirator as it will be contaminated



5

Wash hands with soap and water



Appendix 4

RESUSCITATION ALERT

Monday 23rd March 2020

Guidance on CPR in patients with a COVID-19 like illness or a confirmed case of COVID-19.

During CPR, there is always the potential for rescuers to be exposed to bodily fluids, and for procedures such as ventilation, to generate an infectious aerosol.

Patients with a COVID-19 like illness, who are at risk of acute deterioration or cardiac arrest, should be identified early. Appropriate steps should be taken to prevent cardiac arrest and avoid unprotected CPR. Full and accurate use of NEWS2 will enable early detection of acutely ill patients. Patients for whom a 'do not attempt cardiopulmonary resuscitation' (DNACPR) and/or other similar decision is appropriate should also be identified early.

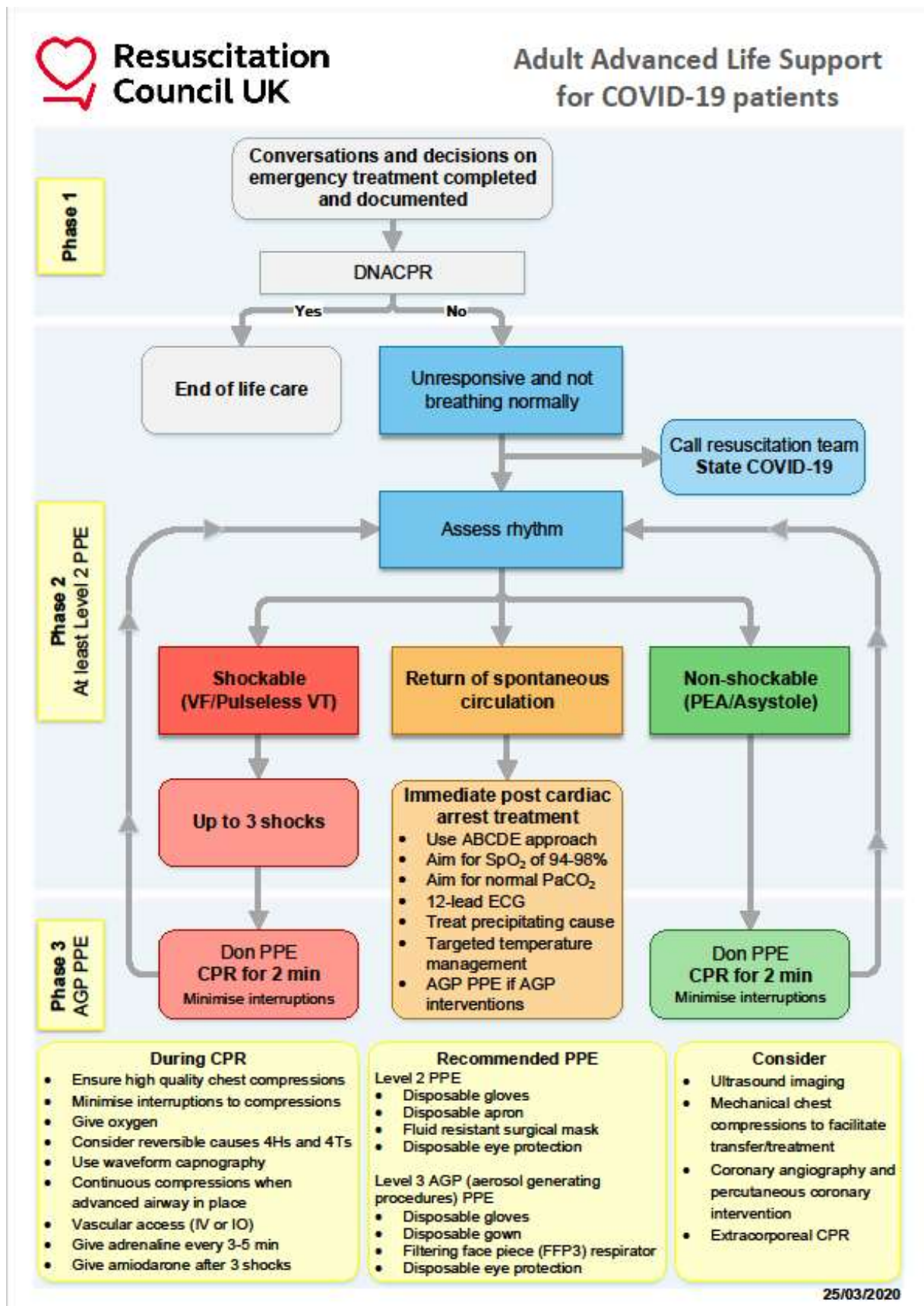
Staff safety is paramount!

Changes to CPR during the COVID-19 epidemic.

- Equipment must be made readily available to protect staff during resuscitation attempts. It is acknowledged that this may cause a brief delay to starting chest compressions, but the safety of staff is paramount.
- Recognise cardiac arrest by looking for the absence of signs of life.
- Feel for a carotid pulse if trained to do so. Do not listen or feel for breathing by placing your ear and cheek close to the patient's mouth.
- If there are any doubts about the diagnosis of cardiac arrest, the default position is to start chest compression-only CPR until help arrives; if they don't look alive, they're probably not.
- When calling 999 or 2222, state the risk of COVID 19.
- Attach an AED as soon as possible.
- Defibrillate shockable rhythms rapidly - the early restoration of circulation may prevent the need for airway and ventilatory support.
- Do not undertake mouth-to-mouth ventilation.
- Do not use a pocket mask.
- If the patient is already receiving supplemental using a face mask, leave the mask on the patient's face during chest compressions as this may limit aerosol spread. Change to a BVM ASAP. If one is not readily available, put an oxygen therapy mask on the patient's face.
- Restrict the number of staff in the room (if a single room). Allocate a gatekeeper to do this.
- Dispose of, or clean, all equipment used during CPR following the manufacturer's recommendations and ELFT guidelines. Any work surfaces used for airway/resuscitation equipment will also need to be cleaned according to ELFT guidelines. If used, put the contaminated end of the Yankauer inside a disposable glove.
- Remove PPE safely to avoid self-contamination and dispose of clinical waste bags as per ELFT guidelines. Thoroughly wash hands with soap and water; alternatively, alcohol hand rub is also effective.
- Post resuscitation debrief is important and should be planned.

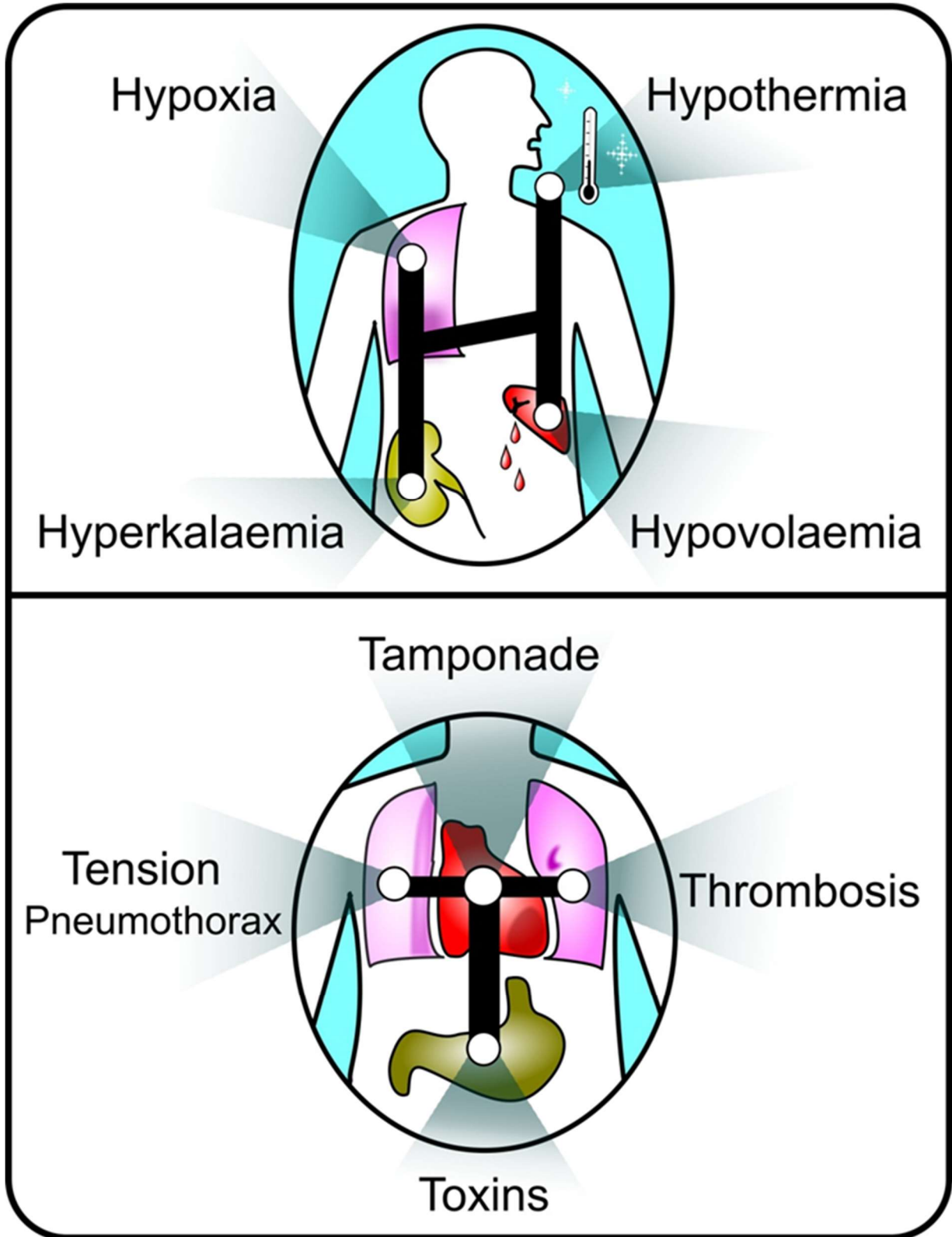
Simon Small, Resuscitation Lead

Appendix 5 (Cardiac Arrest Algorithm as per ILS training)



Appendix 6

(4 H's & 4 T's)





Additional considerations, in addition to standard infection prevention and control precautions,

where there is sustained transmission of COVID-19, taking into account individual risk assessment for this new and emerging pathogen, NHS and independent sector

Setting	Context	Disposable Gloves	Disposable Plastic Apron	Disposable fluid-repellent coverall/gown	Surgical mask	Fluid-resistant (Type IIR) surgical mask	Filtering face piece respirator	Eye/face protection ¹
Any setting	Direct patient/resident care accessing an individual that is not currently a possible or confirmed case ² (within 2 metres)	✓ single use ³	✓ single use ³	✗	✗	✓ risk assessed seasonal use ^{4,5}	✗	✓ risk assessed seasonal use ^{4,5}
Any setting	Performing an aerosol generating procedure ⁶ on an individual that is not currently a possible or confirmed case ²	✓ single use ³	✗	✓ single use ³	✗	✗	✓ single use ³	✓ single use ³

Table 4

1. This may be single or reusable face/eye protection/full face visor or goggles.
2. A case is any individual meeting case definition for a possible or confirmed case: <https://www.gov.uk/government/publications/what-is-covid-19-infection-investigation-of-possible-cases-investigation-and-initial-clinical-management-of-possible-cases-of-wuhan-novel-coronavirus-wncov-infection>
3. Single use refers to disposal of PPE or decontamination of reusable items e.g. eye protection or respirator, after each patient and/or following completion of a procedure, task, or session; dispose or decontaminate reusable items after each patient contact as per Standard Infection Control Precautions (SICPs).
4. Risk assess refers to utilising PPE when there is an anticipated/likely risk of contamination with splashes, droplets of blood or body fluids. **Where staff consider there is a risk to themselves or the individuals they are caring for they should wear a fluid repellent surgical mask with or without eye protection as determined by the individual staff member for the care episode/single session.**
5. A single session refers to a period of time where a health care worker is undertaking duties in a specific care setting/exposure environment e.g. on a ward round; providing ongoing care for inpatients. A session ends when the health care worker leaves the care setting/exposure environment. Seasonal Use should always be risk assessed and consider the risk of infection to and from patients, residents and health and care workers where COVID-19 is circulating in the community and hospitals. PPE should be disposed of after each session or earlier if damaged, soiled, or uncomfortable.
6. The full list of aerosol generating procedures (AGPs) is within the IPC guidance [note AGPs are undergoing a further review at present].

