NHS
The Princess Alexandra Hospital
NHS Trust

Adult Level 2 Resuscitation Training Supporting Material

Resuscitation Services
The Princess Alexandra Hospital NHS Trust

Cardiac arrest in adults is often preceded by a period of physiological deterioration (Resuscitation Council (UK) 2010). Many in-hospital cardiac arrests are predicative events not caused by a primary cardiac pathology, however the deterioration in a patient's physiological condition is often poorly recognised and treated (NCEPOD 2012). This marked deterioration is evident in approximately 73% of patients who suffer a cardiac arrest (NCEPOD 2012). It is known that survival from an adult in-hospital cardiac arrest is poor. It has been shown that fewer than 20% of patients who suffer an in-hospital cardiac arrest with survive to hospital discharge (Meaney 2010).

Recent data collected regarding in-hospital cardiac arrests suggests that in the majority, approximately 85%, the primary rhythm was non-shockable and therefore would not benefit from defibrillation (NCEPOD 2012). Non-shockable rhythms are associated with a poorer prognosis (Resuscitation Council (UK) 2010). The above data clearly suggests that healthcare institutions must have systems in place to facilitate earlier recognition of patients who are deteriorating and must have health professionals who are trained to respond to these situations and offer appropriate interventions to prevent further deterioration.

Resuscitation Council (UK) 2021

ABCDE Approach

Assessment of the unwell adult patient is based on a structured systematic assessment incorporating airway, breathing, circulation, disability and exposure, the ABCDE approach.

Airway:

Assessment of the airway should include:

- Airway patency- is the airway clear, is it obstructed or is it at risk of obstruction

Interventions to optimise a patient's airway may include:

- Airway opening manoeuvres e.g. head tilt chin lift and/or the jaw thrust
- Insertion of an airway adjunct e.g. Oro-pharyngeal airway, nasopharyngeal airway or Laryngeal Mask Airway
- Patients who have an obstructed airway should receive high flow oxygen therapy via either a non-rebreathe mask, bag-valve-mask or any other appropriate oxygen delivery system to reduce the risk of hypoxia associated with an airway obstruction

The immediacy of the situation should always be assessed and health care professionals of all grades and experience are advised to have a low threshold for asking for additional help with a critically ill patient. In the context of an airway obstruction this may be an Anaesthetist or the cardiac arrest team.

Breathing:

Assessment of a patients breathing may include the following:

- Inspection - looking for the patient's respiratory rate, evidence of symmetrical chest wall movement, use of accessory muscles, peripheral or central cyanosis, and obvious chest wall deformity/injuries. Oxygen saturation monitoring may be helpful, however health care professionals should remember that oxygen saturation do not provide information on ventilation but may be used as a guide to assist with oxygen therapy.
- Palpation - assessing for equal and adequate chest wall movement, chest wall tenderness, insuring the trachea is central.
- Percussion - noting resonance or other sounds.
- Auscultation - ensuring the patient has equal air entry bilaterally, noting any additional sounds and or the absence of sound

Interventions to help with breathing may include:

- Ensuring the airway is open and patent
- Oxygen therapy-in the critically unwell patient should be initiated at high flow. When appropriate the patient's oxygen therapy should be titrated to achieve target saturations as outlined by the British Thoracic Society.
- Appropriate positioning to facilitate better chest wall movement
- Treatment of the underlying cause of the respiratory insufficiency

Circulation:

Assessment of the patient's circulatory system may include the following:

- Palpation of the patients pulse and assessing their heart rate - the absence of distal pulses may imply distal hypo perfusion
- Assessment of the patient's blood pressure - this should ideally be undertaken manually.
- Capillary refill time.
- Urine output.
- 12 lead or 3 lead ECG-dependant on clinical presentation.
- Assessment for any obvious internal bleeding into cavities e.g. abdominal distension or abdominal pain on palpation.
- JVP

Interventions to assist with circulation may include:

- Ensuring the patients airway and breathing has been optimised.
- Obtain or verify the presence of vascular access - either intravenous or Intraosseous. Heath Care professionals should have a low threshold for consideration of intraosseous needle placement in the critically unwell patient where obtaining intravenous access is either difficult or impossible.
- Consider intravenous or intraosseous fluid therapy - crystalloids would be a suitable fluid to use initially.
- Specific end goal therapy based on clinical presentation e.g. revascularisation for Acute Coronary Syndromes, surgical opinion for surgical presentation.

Disability:

Disability assessment includes:

- Assessment of the patient's level of consciousness - using either the GCS or the AVPU systems
- Assessing the patient's pupillary reaction to a light stimulus - equal and consensual
- Assessment of the patient's capillary blood sugar level
- Gross assessment of the patient's neurological function - power and tone of limbs and facial symmetry.

Interventions for disability may include:

- Reviewing what medications the patient has received or has taken-these may have an adverse effect on their level of consciousness
- Restoration of a normal blood sugar level.

Exposure:

Exposure assessment includes:

- Full top-toe, front and back, assessment of the patient's body looking for rashes, signs of internal or external haemorrhage, limb deformities, bruising, degradation of skin integrity

Sepsis:

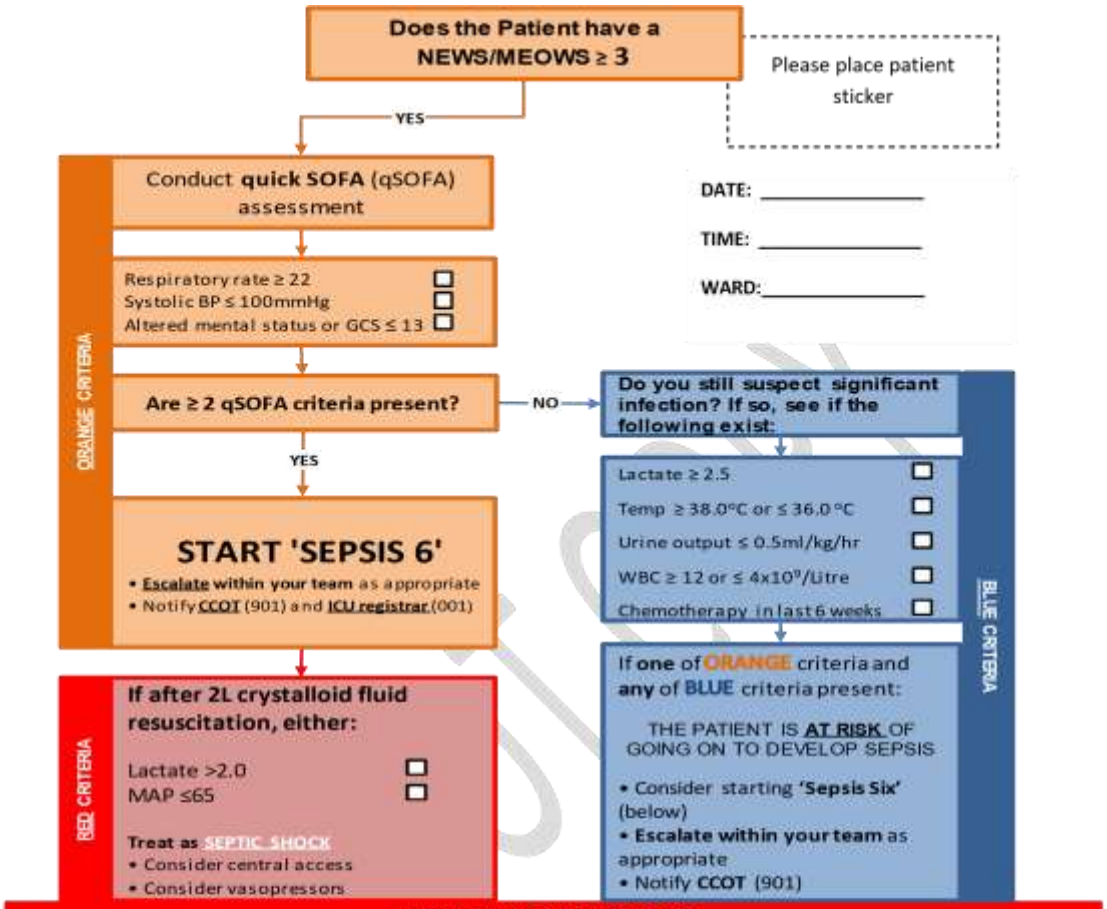
'Sepsis is a life-threatening condition that arises when the body's response to an infection injures its own tissues and organs. Sepsis can lead to shock, multiple organ failure and death especially if not recognised early and treated promptly.'
(Merinoff, 2010).

"Sepsis Six First Hour care duties"

- **Oxygen-** via high concentration mask with reservoir bag to maintain target oxygen saturation
- **Blood Cultures** – prior to antibiotics where possible to identify causative organism
- **Antibiotics** – administer within one hour of recognition of sepsis. Do not delay antibiotics.
- **Fluid Resuscitation**- maintain MAP ≥65mmHg or systolic Bp ≥ 90 mmHg
- **Lactate/Hb/Bloods**- continued monitoring for organ dysfunction and failure to respond to treatment
- **Urinary monitoring** – monitor end organ perfusion. Consider catheter

Ensure you escalate this to the Nurse in Charge and ensure you have a conversation with Critical Care Outreach on bleep 901

ADULT SEPSIS SCREENING PROTOCOL



TREATED AS / TREATING AS:

SEPSIS □ **SEPTIC SHOCK** □

What is the source? If neutropenic contact Acute Oncology bleep 141

Chest □ Urine □ Abdominal □ Bone/Joint □ Blood □ Tissue □ Line □ Neutropenia □ CNS □

	SEPSIS 6	GUIDANCE (tick when started)		STARTED	1 HOUR REVIEW	NON-ADHERENCE
1	ENSURE SENIOR REVIEW >ST3	Name	□	:	:	
2	OXYGEN IF REQUIRED	Start if 02 sats < 92% aim- >94% if COPD aim 88-92%	□	:	:	
3	IV ACCESS-BLOOD CULTURE & LACTATE	FBC,U&E`S,CRP,PCT VBG or ABG as appropriate	□	:	:	
4	GIVE ANTIBIOTICS	Maximum dose broad spectrum as PAH guidelines	□	:	:	
5	GIVE IV FLUIDS	250-500mls STAT Observe response & repeat	□	:	:	
6	MONITOR	U/O output, consider urethral catheter NEWS2- repeat Lactate	□	:	:	

RED FLAGS ALERT 1 HOUR – ESCALATE TO CONSULTANT NOW

Original Authors: Miss Helen Pardoe;
& Dr Matthew Snowsill - 2017

Your future | Our hospital

Updated February 2020

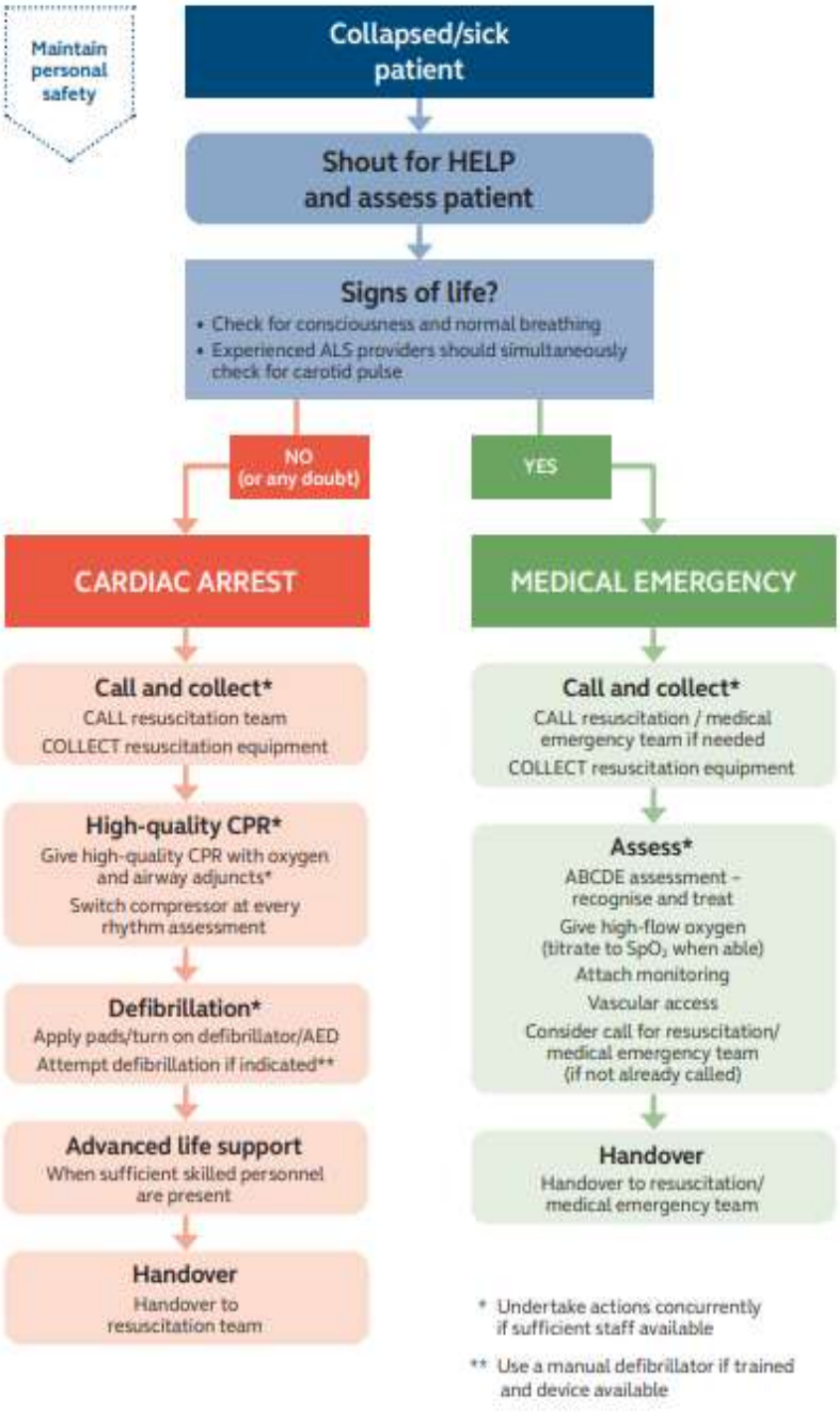
Adult in-hospital Basic Life Support:

- **Safety** - ensure safety of rescuer and patient - take any reasonably practicable steps to ensure safety and/or reduce danger.
- **Response** - check for responsiveness of patient using a shake and shout/appropriate painful stimuli.
- **Ask for help** - either shout and/or use local systems in place to obtain help from staff within immediate vicinity.
- **Airway** - ensure the airway in clear and open -head tilt and chin lift manoeuvre.
- **Breathing** - look, listen and feel for up to 10 seconds for signs of breathing +/- signs of **circulation** (dependant on competency and confidence of the health care professional this may involve palpation of a central pulse). Ignore odd occasional agonal gasps.
- **Ensure the cardiac arrest team has been activated** by asking someone to dial **2222** and stating "adult cardiac arrest team" the accurate location to include site, floor and ward.
- **Commence chest compressions** - hands to be in the centre of the patient's chest-aiming for a depth of 5-6cm and a rate of 100-120 per minute.
- When help arrives with a Bag-Valve-Mask attach this to high flow oxygen and commence 30:2 Compressions: Ventilations CPR until either the cardiac arrest team arrives and takes over from you or the patient shows overt signs of life.
- Ensure that the person delivering chest compressions is rotated every two minutes to avoid fatigue.

Resuscitation Council UK

GUIDELINES 2021

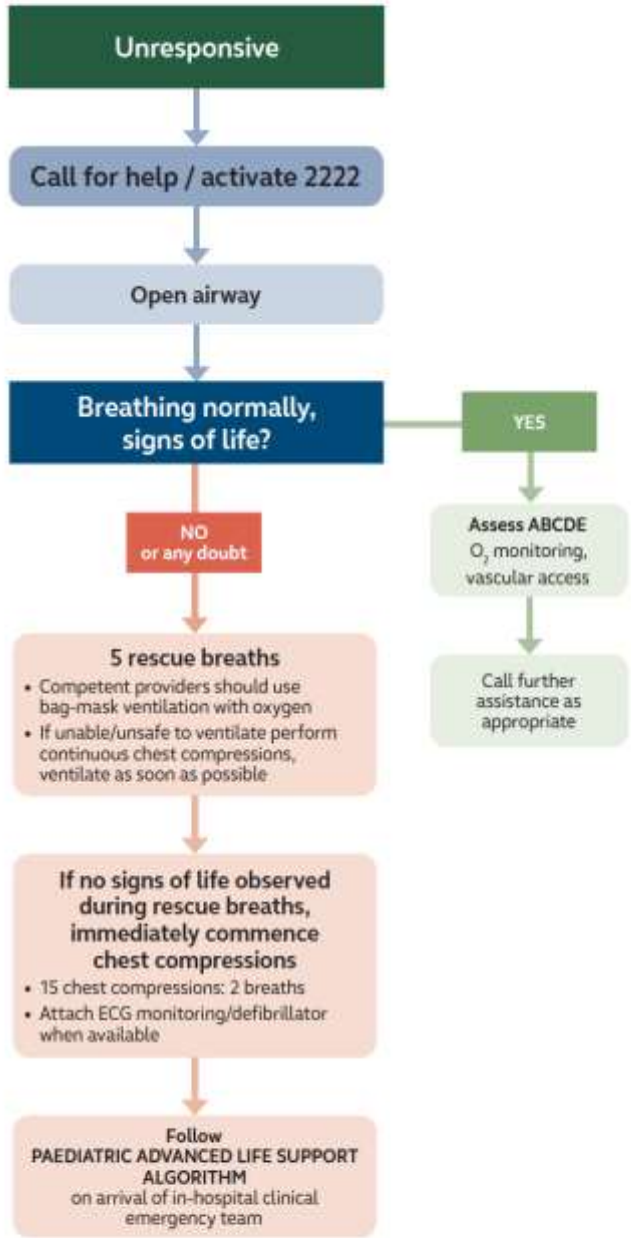
Adult in-hospital resuscitation



Resuscitation Council UK

GUIDELINES 2021

Paediatric basic life support



Resuscitation Council UK

GUIDELINES 2021

Anaphylaxis

Anaphylaxis?

A = Airway B = Breathing C = Circulation D = Disability E = Exposure

Diagnosis – look for:

- Sudden onset of Airway and/or Breathing and/or Circulation problems[1]
- And usually skin changes (e.g. itchy rash)

Call for HELP
Call resuscitation team or ambulance

- Remove trigger if possible (e.g. stop any infusion)
- Lie patient flat (with or without legs elevated)
  - A sitting position may make breathing easier
  - If pregnant, lie on left side

Give intramuscular (IM) adrenaline[2]

Inject at **anterolateral aspect** – middle third of the thigh

- Establish airway
- Give high flow oxygen
- Apply monitoring: pulse oximetry, ECG, blood pressure

If no response:

- Repeat IM adrenaline after 5 minutes
- IV fluid bolus[3]

If no improvement in Breathing or Circulation problems[1] despite TWO doses of IM adrenaline:

- Confirm resuscitation team or ambulance has been called
- Follow REFRACTORY ANAPHYLAXIS ALGORITHM

1. Life-threatening problems

Airway
Hoarse voice, stridor

Breathing
↑work of breathing, wheeze, fatigue, cyanosis, SpO_2 <94%

Circulation
Low blood pressure, signs of shock, confusion, reduced consciousness

2. Intramuscular (IM) adrenaline
Use adrenaline at 1 mg/mL (1:1000) concentration

Adult and child >12 years:	500 micrograms IM (0.5 mL)
Child 6–12 years:	300 micrograms IM (0.3 mL)
Child 6 months to 6 years:	150 micrograms IM (0.15 mL)
Child <6 months:	100–150 micrograms IM (0.1–0.15 mL)

The above doses are for IM injection **only**.
Intravenous adrenaline for anaphylaxis to be given **only by experienced specialists** in an appropriate setting.

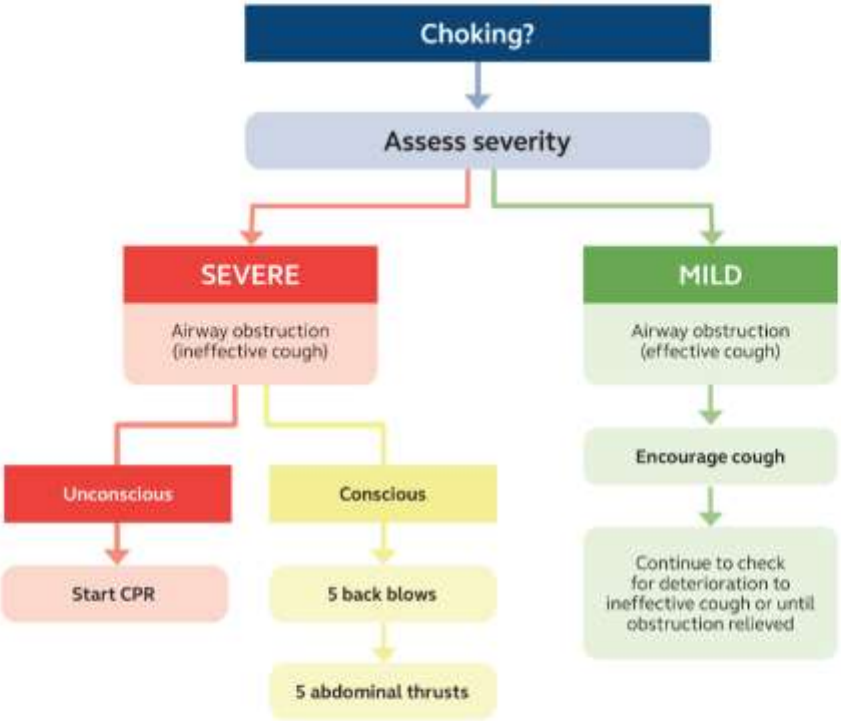
3. IV fluid challenge
Use crystalloid

Adults: 500–1000 mL
Children: 10 mL/kg

Resuscitation Council UK

GUIDELINES 2021

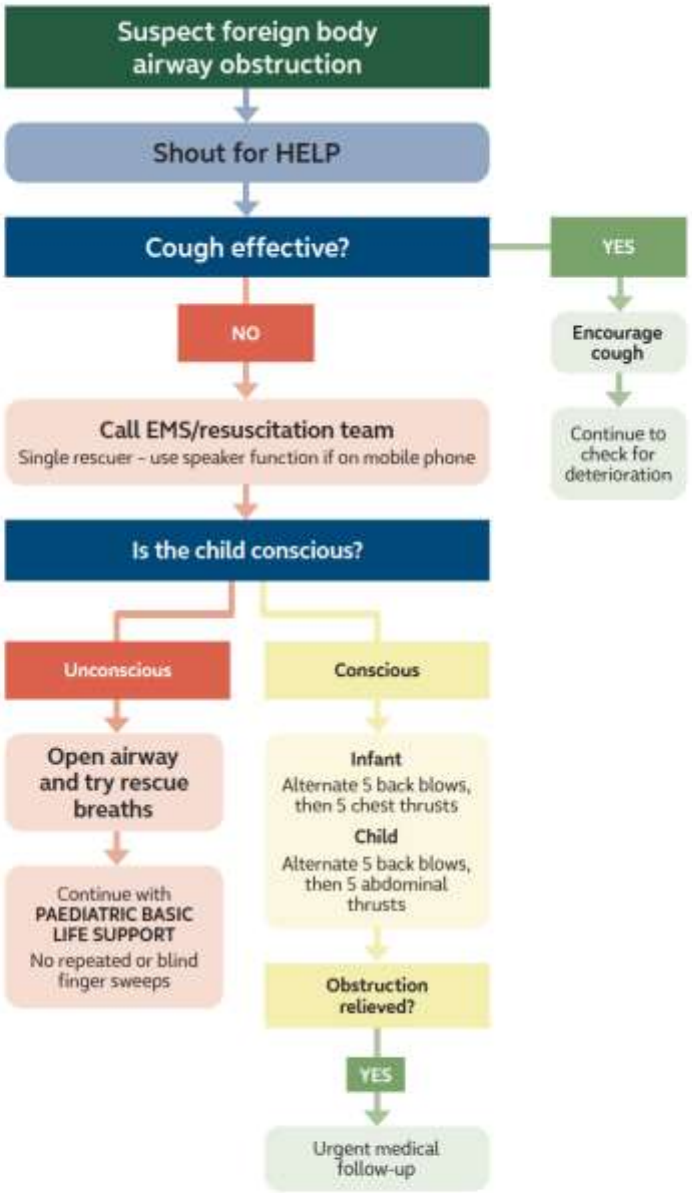
Adult choking



Resuscitation Council UK

GUIDELINES 2021

Paediatric foreign body airway obstruction



Your Resuscitation trolley and checklist

Please read carefully

This system has been designed to be easy and quick to check, with the aim of improving Resuscitation trolley compliance and patient safety. Stocking is aimed at incorporating only necessary equipment.

The Trolley Top and seal documentation are to be completed **DAILY.** Full trolley check and re-seal is to be performed **WEEKLY**.
The Airway and Circulation drawers contain plastic wrapped trays. **These trays are only to be opened for emergency use.** As long as they remain fully wrapped and in date you can consider the drawer checked**.**

The **Airway** tray is wrapped in **blue**

The **Circulation** tray is wrapped in **red**

The spare stock of trays is kept in the Resuscitation Store and can be swapped if your tray is out of date or has been opened. Return the tray, with its un-used contents, to the store room and we will recycle them.

Do not leave any sharps or used equipment in your trays
Should you have any further queries, please contact the Resuscitation Service on 8562 or paht.resus@nhs.net

Anaphylaxis

Anaphylaxis is a potentially life-threatening allergic reaction. The recognition of anaphylaxis is based on:

- Sudden onset and rapid progression of symptoms
- Airway, Breathing and/or Circulation problems
- Skin and/or mucosal changes.

Diagnosis is supported if a patient has been exposed to an allergen known to affect them.

Treat life-threatening features using the A-E approach as detailed above. Adrenaline is the first line treatment for anaphylaxis. Give intramuscular adrenaline early, as detailed above. Intravenous adrenaline must only be used in certain specialist settings by those skilled and experienced in its use.

Follow the National Institute for Health and Care Excellence (NICE) guideline for the assessment and referral of patients suspected to have had anaphylaxis. Specifically:

- All patients should be referred to a specialist clinic for allergy assessment.
- Offer patients (or, if appropriate, their parent and/or carer) an appropriate adrenaline injector as an interim measure before the specialist allergy assessment (unless the reaction was drug induced)
- Patients prescribed adrenaline auto-injectors (and/or their parents/carers) must receive training in their use, and have an emergency management or action plan

Mast cell tryptase

There are several differential diagnoses for anaphylaxis, and an elevated serum tryptase can be very useful to confirm anaphylaxis where the diagnosis is uncertain. Mast cell tryptase should be measured in all patients with suspected anaphylaxis where the diagnosis is uncertain.

The time of onset of anaphylaxis is the time when symptoms were first noticed. It is important that this time is recorded accurately.

Sample timing

a) Minimum: one sample, ideally within 2 h (when peak tryptase levels generally occur) and **no later than 4 h after onset of symptoms**.
b) Ideally: take three timed samples:

1) An initial sample as soon as feasible – but do not delay treatment to take sample.
2) A second sample 1 – 2 h (but no later than 4 h) after onset of symptoms.
3) A third sample at least 24 h after complete resolution, or in convalescence (for

Serial samples have better specificity and sensitivity than a single measurement in confirming a diagnosis of anaphylaxis.

For more information on anaphylaxis and Mast cell tryptase testing, please see link below:

https://www.resus.org.uk/sites/default/files/2021-05/Emergency%20Treatment%20of%20Anaphylaxis%20May%202021_0.pdf

DNACPR

"Cardiopulmonary resuscitation (CPR) was introduced in the 1960s as a treatment that for some people may re-start their heart when they suffer a sudden cardiac arrest due to a heart rhythm disturbance, most commonly triggered by acute myocardial infarction ('heart attack') from which they would otherwise have been expected to make a good recovery. The context of sudden cardiac arrest in a person with a heart condition remains the situation in which CPR is most likely to be successful. The probability of success in any individual is influenced by other factors and in many people with advanced chronic disease the likelihood of CPR being successful is relatively low. CPR involves chest compressions, delivery of high-voltage electric shocks across the chest, attempts to ventilate the lungs and injection of drugs".

Adults with capacity may decide to refuse CPR, with or without giving a reason for their decision. Decisions about CPR may be made following consideration of a balance of benefits and burdens. In other cases, the decision not to attempt CPR is a clinical decision, if the clinical team has good reason to believe that a person is dying as an inevitable result of advanced, irreversible disease or a catastrophic event and that CPR will not re-start the heart and breathing for a sustained period. If there is no realistic prospect of a successful outcome, CPR should not be offered or attempted.

Q. If we find an unresponsive patient and we are not sure if they are for resuscitation or not, what should we do?
A. "In these circumstances initiating CPR will usually be appropriate, whilst all possible efforts are made to obtain more information to guide further decision-making. There will be some situations in which CPR is started on this basis, but during the resuscitation attempt further information becomes available that makes CPR inappropriate. That information may include a fully documented DNACPR decision, a valid and applicable advance decision to refuse treatment (ADRT), or clinical information indicating that CPR will not be successful. In such circumstances, continuing attempted resuscitation would be inappropriate".

Q. What if a patient has a valid DNACPR form but suffers an arrest due to a reversible cause e.g. choking or anaphylaxis?
A. "Occasionally, some people for whom a DNACPR decision has been made may develop cardiac or respiratory arrest from a readily reversible cause such as choking, a displaced or blocked tracheal tube, or blocked tracheostomy tube. In such situations CPR would be appropriate, while the reversible

cause is treated, unless the person has made a valid refusal of the intervention in these circumstances. To avoid misunderstandings it may be helpful, whenever possible, to make clear to patients and those close to patients that DNACPR decisions usually apply only in the context of an expected death or a sudden cardiorespiratory arrest and not to an unforeseen event such as a blocked airway".

Ligature Cutters

What is a ligature?

It is anything that can be used to make a loop or a noose with the intention of deliberate or accidental self-harm by hanging or asphyxiation e.g.

• Light/pull cords • Bedding (intact or torn into strips) • Clothing • Shoe laces • Electric cords/pull bells/phone chargers • Plastic bags • Guitar strings • Plastic apron

Why are they necessary?

A requirement for anti-ligature cut down tools evolved from a PSI issued in June 2006 that mandated the need for all uniformed staff within closed or semi open establishments to have access to anti-ligature cut-down tools. Anti-ligature tools are a national requirement underpinned by PSO 2700 (Suicide Prevention and Self Harm Management).

What can the ligature cutter be used for?

• Strapping • Bubble wrap • Tape • Rope • Some wires • Shrink wrap • Plastic ties

Ligature Cutting equipment

Must be available in all clinical areas • Stored on the Resus Trolley (**bottom drawer**) or Grab Bag • They are replaceable via the centralised resuscitation store (Winter Ward OR call 8562)

What to do on finding someone who has used a ligature

GET HELP – pull the emergency buzzer dial 2222/9999 (state medical emergency and your exact location) • Request ligature cutters from the Resus trolley • SUPPORT the persons weight (if safe to do so) • As soon as possible release the tension on the ligature • Keep the body weight supported or the tension off the ligature until cut • If the individual is unresponsive then attempt resuscitation in line with Level 2 training.

References:

Meaney PA, Nadkarni VM, Kern KB, Indik JH, Halperin HR, Berg RA. Rhythms and outcomes of adult in-hospital cardiac arrest. Crit Care Med 2010;38:101-8

Resuscitation Council (UK) Adult in hospital Guidelines 2015

National Confidential Enquiry Patient Outcome and Deaths (NCEPOD) 'Time to Intervene' - A review of patients undergoing cardiopulmonary resuscitation as a result of an in-hospital cardiorespiratory arrest. 2012

Decisions relating to cardiopulmonary resuscitation – The British Medical Association (BMA), Resuscitation Council UK, and the Royal College of Nursing (RCN) have issued updated guidance regarding anticipatory decisions about whether or not to attempt resuscitation in a person when their heart stops or they stop breathing.

Ligature cutter guidance – NHS England (Ligature and ligature point risk assessment tools and policies)