

Life After Apparent Death

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Time-line

1min: Introduction

5-7min: Mock CPR

- BP
- ECG
- IVC
- Intubate/ventilate
- Compressions
- Note taker
- Call owner
- Administer drugs
- IVF/Crystalloids
- Warming (H2O bottles, baer hugger)

10-12min: Presentation

- Congratulate for a good CPR
- Anything that worked? Didn't?
- Could anything be improved?

* Typically defined as a sudden cessation/ceasing of functional ventilation and effective circulation.

* Successful recovery highly depends on pt history, current health status, prior drug therapy, precipitating event, operator of CPRs skill and drug support during CPR.

* There should be a designate area for CPR in your clinic, where an anesthetic machine is easily hooked up and drugs and supplies are easily accessible.

How to perform a more than adequate CPR:

ABC's

A-Airway
B-Breathing/Bleeding (internal/external)
C-Circulation/level of consciousness
D-Disability
E-Exposure

- Patient should be in Right Lateral Recumbancy
- ET tube placed
- Ventilate 1x for every 15 compressions
- Ventilate at 20-25cm H2O
- ECG
- TPR
- BP
- IVC/IVF
- CPR drugs

- Compressions 80-100/min
- Cease compressions every 2-3minutes to assess the ECG rhythm, if present.
- Intermittent abdominal compressions may augment carotid arterial pressures and cerebral and myocardial bloodflow. Place palm into abdomen and press towards backbone for 5-10 seconds q 2-3/min. **ALWAYS ASK FIRST** prior to performing this task!!
- When do we shock a patient??
 - Ventricular Fibrillation-- this is the best chance to return the heart rate back to a sinus rhythm.
 - A decreased amount of energy is needed when epinephrine and lidocaine have been previously given.
 - Clip hair on chest wall, place in VD, no open O2, make sure a closed system to not start a fire. 3-5 Joules/kg initially, 5-7 J/kg, then 7-10 J/kg. Pause between countershocks should only be to re-charge the defibrillator and assess the ECG.
 - Be extremely CAREFUL NOT to shock YOURSELF!!! **ALWAYS** yell **CLEAR** prior to shocking patient.

CPR drugs:

- Epinephrine 0.01-0.02mg/kg IV
- Lidocaine 2% 2-4mg/kg dog, 0.75-1.0mg/kg cats IV bolus 1x
 - 2-3mg/kg/hr dog, 0.5-2.0mg/kg cat
- Atropine 0.02-0.04mg/kg IV
- Mannitol 100-250mg/kg over 10min, can be repeated q4-6hr for 2 or more treatments
- Sodium bicarbonate 1-2mEq/kg
- Amiodarone 5-10mg/kg IV (ventricular fib)
- Dopamine 5microgm/kg/min (persistent hypotension)
- Dobutamine 5microgm/kg/min (dogs only) (persistent hypotension)
- Vasopressin 0.8U/kg once
- Calcium Gluconate 10% 2-4mg/kg IV
- Dextrose 50%
- Dex SP 0.25mg/kg SID x2days to reduce cerebral edema

Fluids/Blood Products:

- Whole blood 10-20ml/kg based on blood loss
- Synthetic colloids (hetastarch 6%, Dextran 70, pentastarch) 5-10ml/kg dog or 2-5ml/kg cat with a max at 20ml/kg for dog and 10ml/kg for cat.
- Fresh Frozen Plasma 10-20ml/kg, thawing prevents using this initially.
- Crytalloids (Norm R) bolus 10-20ml/kg dog and 5-10ml/kg cat followed by maintenance at 10/ml/kg/hr, this includes the bolus already given. DO NOT overload with fluids.
- Prbc are also used in many situations, readily available and no waiting time to administer.

3 types of CPR

1. Anesthetic Induced
2. Trauma Induced
3. Age/disease causing

Anesthetic Induced

- Watch your monitoring equipment, but do NOT rely on it alone....best monitoring device is yourself!
- Doctor is almost always there, at least is in the hospital. But is not always able to aid in performing the CPR. However, if in a procedure like a spay, they may be able to visualize the veins and arteries, possibly even open his/her incision larger to visualize or manually massage the heart if drug intervention doesn't work.
- It is also possible to make it through surgery and have your arrest be after surgery. That's why it is so important for monitoring to occur after you procedure is done.
- Type of procedure also is a factor....Spay vs Lung lobectomy

Trauma Induced

- Can come in during arrest or arrest shortly after arrival.
- Typically we have started our initial diagnostics.
- Monitor your critical patient closely. Watch for respiratory changes; always have your stethoscope to easily monitor your patient for cardiac arrhythmias.
- If unable to obtain a BP (Doppler preferred), can you feel it manually?? Femoral/Pedal??
- If possible always have someone with or directly observing your critical patient.
- GDVs can be in this category as well because their bodies are incurring a traumatic event.
 - DO NOT leave with owner
 - Always OK to ask if can shoot an xray.
 - Its ok to tell your client what your worries are, you see this sort of thing more than they do, you're the professional.
 - They are worried too, if its something we can diagnose quickly they are usually more confident in decision making.

Age/Disease causing

- Usually a grave prognosis
- Many different reasons for CPR in this category....any ideas??

Splenic mass/rupture
DIC
IMHA
ITP
Rat bait/Coagulopathies
Severe HGE
Neurologic Disorder
Parvo
CHF/arrhythmias
Acidemia
Cancer
Vagal stimulation

Equipment

- YOURSELF

- Pulse ox
- ECG
- BP (Doppler)
- Thermometer
- ETCO2 (maintain at 30-35mmHg)
- ET tubes
- Anesthetic machine
- suction

Bloodwork

Usually we will start bloodwork as a secondary step. If we can get some simulation of the pet back, the doctor may order bloodwork to determine a problem if the arrest or the cause of the event is unknown. However, the most important thing is to deal with your PATIENT first, diagnose later.

*Post CPR management is crucial to reduce the chance of re-arrest. This is highly likely unless underlying cause is found.

***NOT ALL** resuscitative efforts are successful as we know...

NEW STATS:

- 10% successful in vet pts, similar to humans with 25% success rate. Also reporting 19% have normal neurologic function at discharge.
- Majority of these patients are anesthetic arrests, or where and underlying cause is easily detected, recognized and reversible.

Good Prognostic Signs:

- Rapid recovery of corneal reflexes, upper airway reflexes (swallowing/sneezing) and spontaneous breathing.

Poor Prognostic Signs:

- Continued unconsciousness
- No responsive pupils
- Persistent hypovolemia
- Hypothermia