CPCR

Cardiopulmonary Cerebral Resuscitation

Steps of CPCR

5 Domains of CPCR

- Cardiopulmonary Cerebral Resuscitation
  - Preparedness and Prevention
  - Basic Life Support (BLS)
  - Advanced Life Support (ALS)
  - Monitoring
  - Post-Cardiac Arrest Care
- Goal
  - ROSC: Return of Spontaneous Circulation

Preparedness and Prevention

Preparedness

- Equipment organized into crash cart
- Charts and Aids
  - CPR algorithm, Dosage chart
- CPR training
  - Mock codes q 3 - 6 months
- Team Leaders
  - Solicit input from team members
- Communication
  - Closed loop communication
- Documentation ready

Prevention

- Look for signs of decompensation
  - Changes in respiratory rate
  - Changes in respiratory character
  - Hypotension
  - Bradycardia
  - Hypothermia
  - Cyanosis
- Attempt to correct the problems before cardiac arrest

Basic Life Support (BLS)

BLS is comprised of 3 main objectives:

- Cardiac Compressions
- Airway
- Breathing (ventilation)

- Initiation
  - Apneic and unresponsive - initiate CPR

- Cardiac Compressions
  - Positioning
    - Keel chest and cats - lateral recumbency, hands over heart
    - Large and giant breeds w/ round chests - lateral recumbency, hands over widest part of chest
    - Barrel chested - dorsal recumbency directly over the heart

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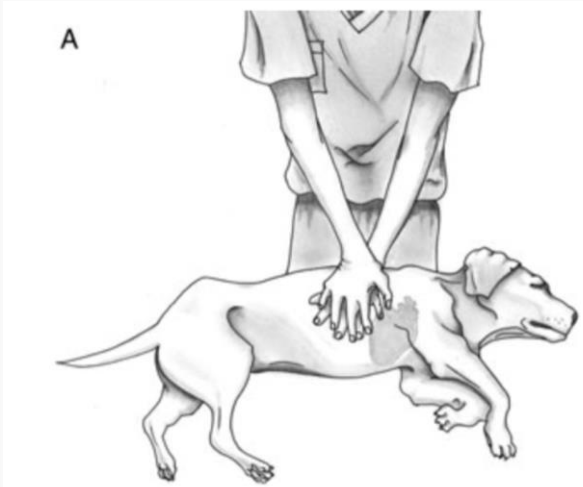

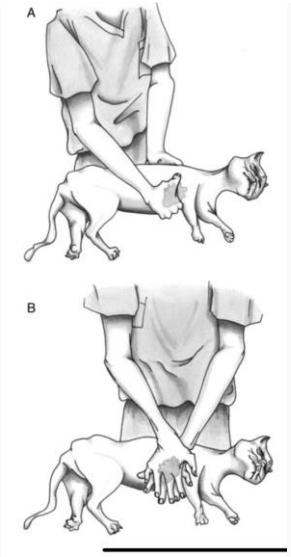

Basic Life Support (BLS)

BLS is comprised of 3 main objectives:

- Cardiac Compressions
- Airway
- Breathing (ventilation)

- Cardiac Compression Technique
  - Rate 100 - 120bpm
  - Deep chest compressions ½ - ⅓ width of the thorax
  - Full chest wall recoil (take your hand off)
  - Change compressors every 2 minutes

- Airway
  - Fast intubation w/ an endotracheal tube
  - Stay in lateral recumbency or dorsal recumbency
  - Inflate cuff

- Breathing (ventilation)
  - Rate of 10 breaths/min (1 breath every 6 seconds)
  - Short inspiratory rate of 1 sec

Advanced Life Support (ALS)

These more advanced therapies are expected to happen at the same time or shortly after initiating BLS.

Objectives of ALS:

- Initiate Monitoring
- Route for drug administration
- Medications
- ECG
- Defibrillation

- Initiate Monitoring
  - Place ECG
    - DO NOT USE ALCOHOL
    - Use gel
  - Place CO_2 monitor

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Objectives of ALS:

- Initiate Monitoring
- Route for drug administration
- Medications
- ECG
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- Routes for Drug Administration
  - IV catheter - Largest catheter possible
  - IO - intraosseous catheter
  - IT - intratracheal
    - Dilute w/ sterile saline
    - Administer via ET tube

- Common Medications
  - Epinephrine
    - Most effective medication
    - Adrenergic agonist - like adrenaline
    - Vasopressor - causes vasoconstriction
    - Positive ionotrope - increases strength of contraction
    - Positive chronotrope - increases heart rate
    - Use low dose 0.01mg/kg q 3 - 5 min or every other cycle

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- Common Medications
  - Vasopressin
    - Arginine vasopressin used for mammals
    - Antidiuretic causing vasoconstriction
      - Affects heart, smooth muscle of the GI system, and vessels
    - No chronotropic or ionotropic effects
    - 0.8U/kg q 3 - 5 min or every other cycle
  - Atropine
    - Anticholinergic, blocks parasympathetic nervous system (blocks rest and digest)
    - Positive chronotropic - Treats bradycardia and AV block
    - Dose: 0.04mg/kg

Advanced Life Support (ALS)

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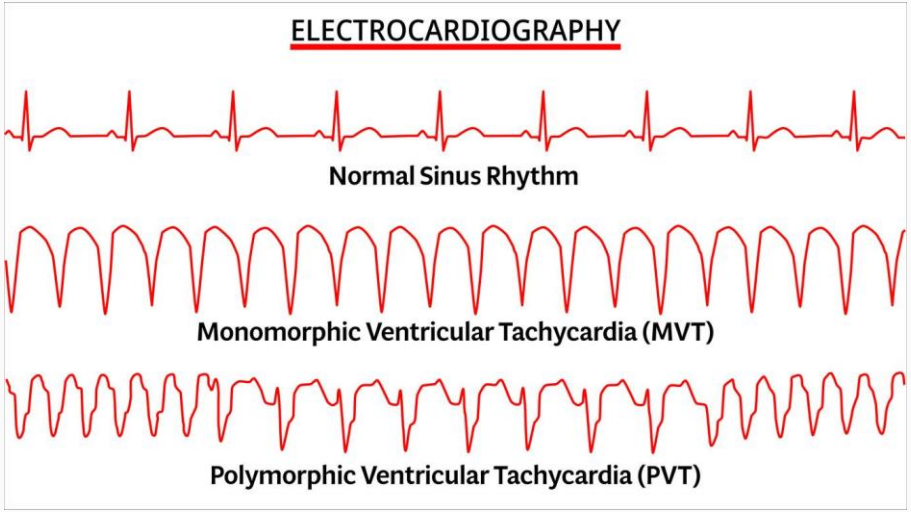
Objectives of ALS:

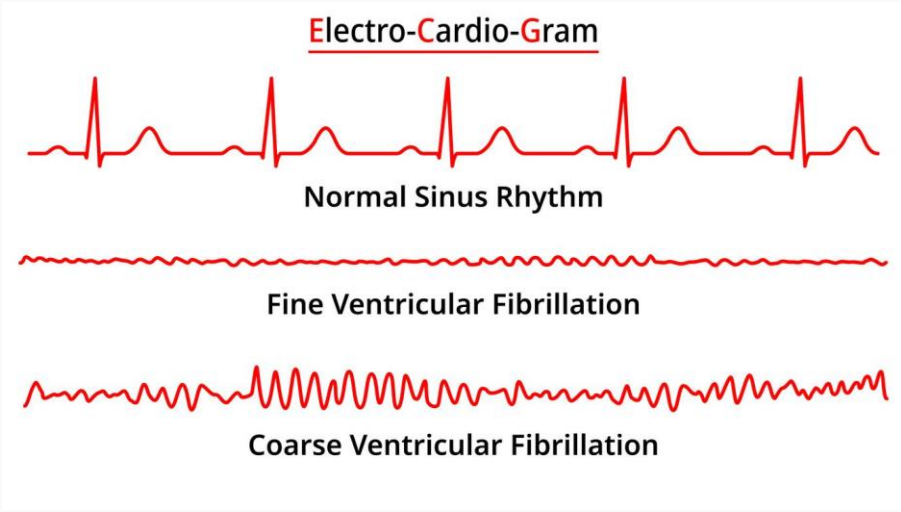
- Initiate monitoring
- Route for drug administration
- Medications
- ECG
- Defibrillation

- Common Medications
  - Administer reversals
    - Opioids = Naloxone
    - Alpha-2 agonists = Atipamizole
    - Benzodiazapines = Flumazenil
  - NO STEROIDS
  - IV fluids often not needed

- Cycle
  - 2 minutes
    - Chest compressions
    - Ventilation
    - Medications
  - Check ECG
  - If no ROSC, repeat 2 min cycle with new compressors

ECG Shockable Rhythms





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- Initiate monitoring
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- Medications
- ECG
- Defibrillation

- Defibrillation
  - Biphasic - energy flows one way and then reverses
  - Instructions
    - Place in dorsal recumbency
    - Shave spot on either side of the chest over the heart
    - Use gel on pads
    - Place pad on either side of the heart
    - YELL CLEAR and make sure no one is touching the table or patient
    - Place patient in lateral recumbency
    - Immediately restart chest compressions

Monitoring

- ECG
  - Monitor for VF and VT
  - Monitor for normal waveforms
- CO_2 monitor
  - Higher $ETCO_2$ during CPR associated w/ increased rate of ROSC
    - Dogs >15 mm Hg
    - Cats >20 mm Hg

Post-Cardiac Arrest Care

- Respiratory
- SpO_2
- MAP
- Neuroprotection
- Basic Nursing Care

- Respiratory
  - Check $EtCO_2$ and SpO_2
    - This will determine if the pet needs to be on a ventilator vs. supplemental oxygen
  - MAP
    - Consider:
      - IVF
      - Vasopressor
      - + Ionotrope
      - Possibly treat pain
- Neuroprotection
  - Hypothermia
  - Mannitol
  - Seizure prophylaxis

Post-Cardiac Arrest Care

- Respiratory
- SpO_2
- MAP
- Neuroprotection
- Basic Nursing Care

- Basic Nursing Care
  - Lube eyes
  - Urinary catheter
  - Turn frequently
  - Passive range of motion
  - Elevate head and neck 15 - 30 degrees

References

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