

Care of the Potential Organ Donor

- There is a disparity between the number of potential organ donors and that of actual donors.
- In order to address the shortage, we must recover organs that offer the greatest likelihood of successful outcomes for recipients
- Optimize care of the potential donor



Timely Treatment is Critical

- The use of standardized treatments and algorithms that are focused on managing the hemodynamic status of the donor have proved to be beneficial in maintaining the stability of potential donors.
- Standardization protocols takes organs that were unsuitable and makes them more suitable
- Protocols minimize the loss of donors during maintenance and brain death





All organs benefit from optimal hemodynamic Management

- Increase the numbers of organs procured
- Improves graft function in the recipients.



Cardiovascular Effects

- Brain death adversely affects the cardiovascular system
- Ischemia in the medulla provokes sympathetic surge to maintain cerebral perfusion pressure
- Brain ischemia is associated with necrosis that is concentrated in the left ventricular sub endocardium and ischemic changes in the EKG

Goals of Management

- Achieve Normovolemia
- Maintain blood pressure
- Optimize cardiac output utilizing the least amount of vasoactive drug support

Heart Donation

- Heart donors should not be excluded on the initial EKG.
- Hearts can recover left ventricular function after herniation



Hypotension

- Associated with decrease in organ function
- Common in hypovolemic donors
- Seen with patient in Diabetes Insipidus who are not receiving ADH (vasopressin)
- Give PRBC for Hematocrit of 30 for oxygen delivery
- Utilize 0.45 NS for hypernatremia

Hyperglycemia

- Physical stress, increase in the levels of counter regulatory hormones, dextrose solutions, peripheral resistance to insulin all contribute to hyperglycemia



Hyperglycemia

- Discourage use of large amounts of dextrose solutions – creates an osmotic diuresis and electrolyte abnormalities
- Maintain Blood Glucose levels between 80-150 with an Insulin Infusion

Fluid Management

- Minimally positive fluid balance is associated with higher rates of lung procurements
- Colloid solutions are recommended to sustain oxygenation and minimize the accumulation of pulmonary edema

Vasoactive Medications

- When adequate volume resuscitation occurs, vasoactive medications are necessary if hypotension continues
- Low dose vasoactive drug support has shown a reduction in the rates of acute rejection after renal transplant and improved rates of graft survival.

Vasopressin

- Arginine vasopressin is an alternative vasopressor that can be administered to support potential donors who have hypotension
- Enhances vascular sensitivity to catecholamines while maintaining hemodynamic stability.

Vasopressin

- Anti Diuretic effects
- Decreases serum osmolarity
- Decreases sodium levels
- Maintains blood pressure
- Reduces the need for vasoactive medications

Hormone Replacement Therapy

- Dysfunction of the hypo thalamic pituitary adrenal axis during brain death results in the depletion of thyroid hormone and cortisol leading to organ deterioration
- Low levels of thyroid hormone may impair mitochondrial function and the production of ATP.
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Hormone Replacement Therapy

- Hormone replacement improves cardiovascular lability, reduces EKG abnormalities, reduces the acid base disturbances and improves the suitability of organs for transplantation
- Hormone replacements therapy was shown to diminish requirements for vasoactive therapy

Hormone Replacement Therapy

- There also has been a correlation between the substantial number of organs recovered and the use of HRT
- Utilize HRT in donors that have an EF of less than 45% and require multiple vasopressors or high dosage of vasoactive medications.

Cardiac Arrhythmias

- Common and attributable to conduction system necrosis that is secondary to the sympathetic surge that results from medullary ischemia, metabolic disturbances or electrolyte abnormalities
- Arrhythmias are resistant to antiarrhythmic treatment and occur frequently during herniation, try to correct the cause

Arrhythmias

- Lidocaine/Amiodarone have shown to be effective for Ventricular Arrhythmias
- Supraventricular Arrhythmias respond better to Amiodarone
- Brady Arrhythmias are the result of vagus nerve disruption and do not respond to atropine, must use isuprel or epinephrine.



Respiratory Effects

- Optimal Management of donors respiratory function will enhance the quality of all organs to be donated
- Low arterial CO₂ and high minute ventilation used to treat head injuries should be normalized in the donor.
- Normalization limits the potential for ventilation induced injury to the lungs

Respiratory Management

- End Inspiratory Plateau pressure should be limited to less than 30 cm of water.
- Atelectatasis and Excessive Fluid Resuscitation are two correctable causes of hypoxemia that often preclude the use of lungs for transplant.
- Bronchoscopy, suctioning, and judicious fluid resuscitation are all interventions to improve lung outcomes – Maintain CVP 6-8 mm Hg. with diuretic therapy.

Respiratory Management

- Albuterol has been shown to augment the clearance of pulmonary edema and useful in conjunction with diuretics
- Corticosteroids (15 mg/kg) may also stabilize lung function.

Goals of Mechanical Ventilation

- Fraction of inspired oxygen – 0.40
- Partial pressure of arterial O₂ - >100 mm Hg
- Partial pressure of CO₂ 34-40 mm HG
- Arterial pH 7.35-7.45
- Tidal volume 8-10 ml/kg
- PEEP 5 cm H₂O
- Static airway pressure - <30 cm H₂O

Goals of Bronchoscopy

- Evaluate anatomy
- Assess for foreign body and remove
- Define and locate aspirated materials, secretions, or infection
- Clear secretions

Goals of Pulmonary Hygiene

- Prevent atelectasis with the use of suction, percussion and lung expansion techniques

Prevent Hypernatremia

- Hypernatremia in the donor can adversely affect the function of the transplant in the recipient
- DI results from the absence of vasopressin after the destruction of the posterior pituitary gland.

Diabetes Insipidus

- Contributes to hyperosmolarity, hemodynamic instability, electrolyte abnormalities as a consequence of excessive loss of free water
- Treat with Arginine Vasopressin to produce vasoconstrictive and antidiuretic effect – administer as a continuous infusion

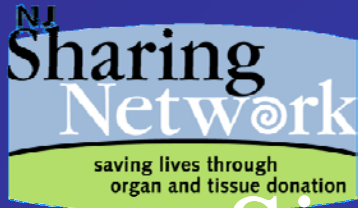
Hypothalamic Thermoregulation

- Adverse effects of hypothermia include cardiac dysfunction, arrhythmias, coagulopathy, cold induced diuresis.
- Maintain core temperature at higher than 35 degrees or 95 F.
- Use warming fluids, blankets.



Key Management Parameters

- CVP 5-10
- Urine output 0.5-3.0 ml/kg/hr
- SBP > 100 & MAP > 65
- Sodium < 155
- Glucose < 140
- pH 7.35 - 7.45
- O2 Sats $> 95 \%$



Care of the Donor is Simultaneous Care of Multiple Recipients.

- Vigilant medical management ensures that the greatest number of organs can be recovered in the best possible condition to provide optimal outcomes for the recipients.
- Current therapies enhance successful organ procurement

