

New England Donor Services

Adult Guidelines for Brain Dead Organ Donor Evaluation & Management

Revised: January 3, 2017

The purpose of this document is to describe the principles of organ donor evaluation and management to be followed for adult NEDS organ donors. These guidelines have been reviewed and approved by the New England Consortium for Heart Transplantation, the Massachusetts Consortium for Lung Transplantation and the NEDS Medical Director.

For each organ donor, the goals of donor evaluation and management include:

- Determination of organ suitability for transplantation
- Optimization of the function of these organs
- Maximization of the number of organs recovered

General Principles

1. Absolute Contraindications to Organ Donation:

- Current malignancy other than primary intracranial tumor or non-melanoma skin cancer

2. Donor Evaluation

Initial assessment shall include a review of the admission history and physical, hospital course, temperature, hemodynamics, fluid balance, electrolytes, CBC, medications, infections, pulmonary, cardiac, renal, and liver functions. In extremely unstable cases (i.e., MAP < 65 mm Hg, SaO₂ < 92, HR < 50 or > 100 bpm, & **refractory to treatment**) plans should be made in consultation with the Medical Director on call to proceed to the operating room ASAP for rapid hepatonephrectomy or nephrectomy. Aggressive management should continue through the recovery surgery.

Attempts should be made to utilize transplant center physicians, accepting surgeons, Advanced Practice Coordinator (APC) and Medical Directors on call as resources for donor management when needed.

3. Determination of Organs Suitable for Transplantation

Organs may be deemed unsuitable based on donor age, organ injury, disease, history or gross abnormality. Questions regarding organ suitability in marginal cases should be directed to the Medical Director on call.

4. Initial Management Goals

Restore and maintain normothermia (36-37.5° C/97-100° F)
Optimize lung function (routine pulmonary toilet & lung recruitment as indicated)

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4. Initial Management Goals (cont.)

Maintain PaO₂ > 100 mm Hg on lowest possible FIO₂ (or O₂ saturation > 95)

Restore intravascular volume

Normalize blood pressure, MAP > 65

Use Phenylephrine (Neosynephrine) as the primary pressor for treatment of hypotension up to 2 mcg/kg/min followed by Levophed if needed

Correct acid/base imbalances so that pH is 7.35 - 7.45

Normalize electrolytes

Maintain hematocrit \geq 27% or Hgb > 8

Treat severe hyperglycemia, central DI, DIC

Monitor Lactate levels closely

Obtain arterial and central venous lines and/or non-invasive hemodynamic monitoring device

5. Organ-specific Considerations and Donor Management challenges

Heart

Consider non-invasive hemodynamic monitoring device in order to determine fluid status and to help manage the patient's hemodynamic status.

May request PA catheter to assess cardiac function and determine appropriate therapy.

If hypotensive with low SVR, prefer treatment with pure vasoconstrictor (first choice - Neosynephrine; second choice - Levophed)

Cardiac catheterization indicated for patients at risk for CAD

ECG and ECHO on day of donation after hemodynamic parameters have been optimized

Consider use of Thyroid Hormone Therapy (T3 or T4) in patients with EF < 45% or if patient is on multiple vasopressors

Cardiac enzymes (Troponin) as indicated by circumstances of donor's admission

Hypertension

Severe hypertension (systolic BP > 180 mm Hg) is infrequently encountered in brain dead patients. Most often, it is temporally related to brainstem herniation and is therefore self-limiting (< 45 minutes). Often, this hypertension is associated with transient rhythm disturbances. On occasion, severe hypertension persists following herniation.

Treatment:

The goal of treatment should be to maintain the diastolic BP below 100 mm Hg. Esmolol may be used for transient hypertension especially when associated with tachycardia; 500 mcg/kg loading dose over 1 minute, (NOTE: May not always give a loading dose) then infuse 25-50 mcg/kg/min and increase by 25 mcg/kg/min every 10-20 minutes to a maximum dose of 300 mcg/kg/min. Or, Nicardipine can be administered starting at 5 mg/hr, titrate up 15 mg/hr to achieve desired blood pressure.

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Hypertension (cont.)

Nipride should only be used in cases of severe, persistent hypertension, and should be discontinued as soon as possible. 100 mg Nipride in 250 ml D5W yields a concentration of 400 mcg/ml.

Initial dosage should be 0.25 mcg/kg/min.

Titrate upward in increments of 0.25 or 0.5 mcg/kg/min to achieve desired BP control.

Consultation should be made with the medical director on call or accepting surgeon (s) regarding the treatment of persistent donor hypertension (i.e. > 1 hour and if other options have been exhausted).

Hypotension

Hypotension (SBP < 90 or MAP < 65 mm Hg) will develop in most brain dead patients at some point in the donor management process. Potential donors may be hypotensive at the time of the initial referral. Even brief intervals of hypotension can have deleterious effects on organ function.

Therefore, hypotension should be treated aggressively with therapy based on a sound understanding of the cause of the hypotension.

A central venous pressure line and an arterial line are essential in order to manage hypotension appropriately. In hemodynamically unstable donors - or potential thoracic organ donors - a pulmonary artery catheter may be introduced, and serial filling pressures, cardiac output, and SVR measurements can be monitored.

Treatment:

1) Neosynephrine (Phenylephrine) at an initial dose of 40 - 60 mcg/min. Titrate to achieve SBP > 90.

2) Dopamine hydrochloride (Intropin) 400mg / 250 ml D₅W yields 1600 mcg/ml

Initial dose is 2 - 4 mcg/kg/min. Titrate to increase MAP > 65 mm Hg.

Consult Cardiology, medical director on call, Advanced Practice Coordinator or accepting surgeon in cases of severe cardiac dysfunction.

3) Norepinephrine Bitartrate (Levophed) 4 mg/250 ml D₅W yields 16 mcg/ml. Start at an initial dose of 0.5 - 1 mcg/min, then gradually increase to a maximum of 30 mcg/min. Monitor CO, SVR, and cardiac filling pressures closely by PA catheter or non-invasive hemodynamic monitoring device.

Decreased Vascular Resistance

Neurogenic vasodilatation (loss of both venous and arterial vasomotor tone) is present in the majority of donors. Despite adequate volume restoration, some donors will require vasoactive drug therapy directed at the underlying cause of the hypotension. Effective management of these donors may be accomplished with assistance from devices such as FloTrac, CardioQ or LiDCO or occasionally with the insertion of PA catheter for determination of cardiac filling pressures, CO, and SVR. Due to the possibility of decreased perfusion to certain organs, vasoconstrictors should be used with extreme caution. High dose vasoconstrictor therapy should be avoided. The systemic vascular resistance (SVR) should be calculated based on thermodilution cardiac output measurements.

If the SVR [(MAP-CVP) x 80/CO] is < 600, vasoconstrictor therapy is indicated.

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Decreased Vascular Resistance (cont.)

Treatment:

Neosynephrine (Phenylephrine) at an initial dose of 40 - 60 mcg/min (from institutional formulation), then titrate to desired SVR

Norepinephrine Bitartrate (Levophed) 4 mg/250 ml D₅W yields 16 mcg/ml

Start at an initial dose of 0.5 - 1 mcg/min, then gradually increase to a maximum of 30 mcg/min.

Monitor CO, SVR, and cardiac filling pressures closely by PA catheter or non-invasive hemodynamic monitoring device. Monitor urine output and serum creatinine closely.

Fluid and Electrolyte Challenges

Hypovolemia

Excessive intravascular volume loss (hemorrhage, third spacing, DI, fluid restrictions, etc.) is common in potential organ donors, especially trauma victims. Neurogenic vasodilatation (loss of both venous and arterial vasomotor tone) is present in the majority of donors as well. One or both of these factors may contribute to a relative or absolute hypovolemia. Therefore, whenever possible, intravascular volume deficits should be corrected prior to the use of vasoactive drugs. (In practice, low to moderate dose dopamine infusion may be required to maintain adequate BP during the initial interval of volume repletion. Once volume is restored, however, vasoactive drugs should be used only as needed.) Care should be taken to avoid the development of pulmonary interstitial fluid overload, especially in potential lung donors. Therefore, in most cases, colloid and blood products should be used in combination with crystalloid solutions for volume expansion.

Treatment:

In general, IV fluid should be 1/2 NS at rate of 1 liter per 1/2 hour to raise CVP

(In adult patients only; Consultation with a pediatric intensivist is advised for fluid management recommendations in pediatric donors).

Use colloid to supplement crystalloid volume expansion. (Review use if pt. is a potential lung donor.)

Monitor CVP closely; target is 4 - 12 cm H₂O (as directed by thoracic teams), avoid excessive increase in CVP. PRBCs are indicated for Hct. < 27 %.

Depressed Cardiac Function

Following resuscitation from cardiopulmonary arrest, due to pre-existing cardiac disease, or secondary to brainstem herniation, some donors may exhibit depressed cardiac function. These patients will be hypotensive despite adequate volume restoration. The use of vasoconstrictors in these patients will exacerbate cardiac dysfunction. Donors with depressed cardiac function require inotropic and chronotropic support to maintain an adequate cardiac output. Effective management of these donors may require insertion of a PA catheter for determination of cardiac filling pressures, CO, and SVR. If the cardiac index (CO/BSA in m²) is less than 2.0 L/min/m², inotropic therapy is indicated.

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Polyuria (cont.)

Polyuria is frequently seen in brain dead patients. It may be due to physiological diuresis, osmotic diuresis, hypothermia-induced diuresis, diabetes insipidus, diuretics, or a combination of the above. Excessive polyuria due to osmotic diuresis or DI may lead to hypernatremia, hypokalemia, and hyperosmolality. Serum electrolytes should be monitored and treated as indicated. Urine and serum electrolyte levels and osmolality aid in the determination of the cause of polyuria.

Physiological diuresis

Aggressive volume restoration may result in a physiological diuresis. No treatment is warranted, but intake and output should be monitored carefully.

Osmotic diuresis

Prior mannitol administration or excessive glucose infusion may result in an osmotic diuresis.

Treatment:

Mannitol administration should be avoided in this setting.

Glycosuria and hyperglycemia should be treated with sliding scale IV insulin therapy to normalize blood glucose levels (Table 1).

Diabetes insipidus

Once the above mentioned causes for polyuria have been excluded, the diagnosis of DI can be made by evaluating the volume of urine output, urine specific gravity, urine and serum electrolyte levels, and urine and serum osmolality. At least three of the following findings should be present simultaneously to establish the diagnosis of DI:

Urine output > 400 ml per hour

Serum sodium > 160 mEq/L

Urine specific gravity < 1.005

Serum osmolality > 305 mOsm/L

Preferred Treatment:

Aqueous pitressin IV infusion (10 units/250 ml D5W)

Initial dosage 1.0 - 1.2 units per hour (rate: 25 - 30 ml per hour). Maximum dose is 3 units/hr.

Titrate every 15 minutes to maintain u/o of 150 - 300 ml/hr.

Discontinue for hourly u/o < 150 ml.

In addition to pitressin therapy, the free water deficit should be calculated and 50% of the calculated deficit should be infused as rapidly as possible, preferably with a hypotonic solution such as 1/2 NS, 1/4 NS, or D₅W, as indicated by serum sodium and glucose levels.

Prior to the operating room, pitressin should be discontinued.

In rare cases, Diabetes Insipidus may not respond to treatment with aqueous pitressin. In those unusual circumstances, ddAVP may be used. The initial dosage should be 0.5 mcg IV and urine output should be observed over the course of one hour. If urine output is still greater than 200 cc/hr, an additional 0.5 mcg of ddAVP may be administered. If there is still no response, the Medical

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Director on call should be consulted.

Electrolyte Abnormalities

Hypernatremia $\text{Na}^+ > 160 \text{ mEq/L}$

If the cause is secondary to polyuria, suggest following guidelines under polyuria. Calculate the free water deficit. Then replace volume with 0.45% NS (or 0.2% NS when available) rapidly. Replace urine volume loss cc for cc/ hour and suggest maintenance IV of D5¼NS. Goal is to reduce serum $[\text{Na}^+]$ 1mEq/hr. Be cautious of rapid reduction of serum $[\text{Na}^+]$.

Hyperkalemia $\text{K}^+ > 5.0 \text{ mEq/L}$

Suggest treatment of $\text{K}^+ > 5.8 \text{ mEq/L}$.

- NaHCO_3 50 mEq slowly
- 25g of 50% Dextrose
- 10 to 15 U of regular insulin IV
- Consider Albuterol via nebulizer

If toxic effects are visible on ECG tracing (widened QRS & peaked T waves), administer 1 pre-filled syringe of 10% CaCl over 5 minutes to antagonize the toxic effects of potassium at the myocardial cell membrane. If the K^+ remains elevated, consult with AMD and consider hemodialysis.

Hypokalemia $\text{K}^+ < 3.5 \text{ mEq/L}$

Suggest treatment if $\text{K}^+ \leq 3.4 \text{ mEq/L}$.

- Administer 20 mEq KCl per hour for 2 hours (total 40mEq KCl).
- If $\text{K}^+ < 3.1 \text{ mEq}$ treat for 3 hours (total 60mEq KCl)
- If $\text{K}^+ < 2.9 \text{ mEq}$ treat for 4 hours (total 80mEq KCl)

Be cautious of hospital specific guidelines surrounding K replacement. It is best to replace K^+ via central catheter. If the K remains $< 3.2 \text{ mEq}$, consult the Medical Director on call.

Calcium

It is recommended to follow the ionized calcium level. Be mindful that the ionized calcium is inversely related to the pH. You should correct the pH before supplementing calcium. Alkalosis increases the binding of calcium to albumin and thus will reduce the calcium. Acidosis decreases the binding of calcium to albumin and will increase the free calcium.

Hypercalcemia **ionized calcium above 4.2mg/dL**

Recommend treating for hypercalcemia only if there are adventitious changes. These may be the following:

- Myocardial depression

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Electrolyte Abnormalities (cont.)

Hypercalcemia (cont.)

- Decreased automaticity
- Shortened QT interval
- Increased PR and QRS intervals
- AV block

Suggest hydration with 500 cc NS to promote calcium excretion in the urine. This maneuver is dependent on cardiac and renal function. Consult with the Medical Director on call to consider hemodialysis.

Hypocalcemia **ionized calcium < 1.1 mg/dL**

Infusion of large amounts of blood that contain citrate or EDTA result in hypocalcemia by chelating serum calcium

Please note the ECG changes of hypocalcemia:

- prolonged QT
- AV block
- ventricular fibrillation

Calcium levels are dependent on concentrations of potassium and magnesium. If you are considering replacing calcium, consider replacing potassium and magnesium as well.

Give 90-180 mg of 10% Calcium Gluconate slow IVP. Consider following this with an IV infusion of 540 to 720 mg of elemental calcium in 500 to 1000ml of D5W at a rate is 0.5 to 2.0 mg/kg /hr. If hepatic function is impaired recommend using Calcium Chloride instead. The calcium gluconate molecule requires hepatic involvement to break down.

Hypermagnesemia **Mg > 2.4 mEq/L**

Magnesium balance is influenced by many of the same regulatory systems as calcium.

Consider treating for hypermagnesemia if toxic effects are present.

- increased PR and QT intervals
- complete AV block

Administer 5-10mEq of CaCl to limit lethal arrhythmias. This dose may be repeated.

Recommend hydration to promote elimination of magnesium in the urine. This of course is dependent on cardiac and renal function. Furosemide can be administered @ 1mg/kg IV.

Consider consulting with NEDS Medical Director prior to Furosemide administration.

Dialysis is the treatment of choice for hypermagnesemia, consult with NEDS Medical Director on call.

Hypomagnesemia **Mg < 1.8 mEq/L**

Hypomagnesemia is more common and usually results from decreased absorption in the kidneys and intestines. The following ECG abnormalities can occur:

- Inverted T
- widened QRS

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Electrolyte Abnormalities (cont.)

Hypomagnesemia (cont.)

- Torsades de pointes (ventricular arrhythmia associated with prolonged QT interval)
- Refractory VF

Replace with Magnesium Sulfate 1-2 g IV over 15 minutes. If Torsades is present, administer over 1-2 minutes. Often Calcium Gluconate is appropriate due to hypocalcaemia. If level remains < 1.8 after administration of 8 g of magnesium sulfate, consult AMD.

Hyperphosphatemia **PO₄ > 5 mg/dL**

Hyperphosphatemia is not independently treated unless renal failure is present. If other electrolyte abnormalities are present, consider hemodialysis after consultation with AMD.

Hypophosphatemia **PO₄ < 2.0 mg/dL**

This is common following renal transplantation and is caused by renal and GI phosphate losses. This should be treated if serum phosphate levels are < 2.0 mg/dL.

Give 15 - 30 mmol of potassium or sodium phosphate over 3 hours and re-check level.

If the phosphate level remains < 2.0 mg/dL after 60 mmol sodium or potassium phosphate has been given, consult AMD.

Coagulopathy/Thrombocytopenia¹

Blood loss may endanger continued perfusion to donor organs. Disseminated Intravascular Coagulation (DIC) may occur after severe trauma and resuscitation. Coagulopathy may be characterized by:

- Prolonged PT (>15 seconds)
- Prolonged PTT (>36 seconds)
- Increased D-dimer (>500 ng/ml)
- Decreased platelets (<150,000/ mL³)
- Decreased fibrinogen (<150 mg/dL)
- Decreased Hct and Hgb

Although lab test results may be abnormal, treatment is often reserved for those donors who exhibit continuing significant blood loss as evidenced by hemodynamic instability, physical assessment, and abnormal coagulation parameters. If there is any question as to whether a coagulopathy requires treatment, consultation should be made with the Medical Director on call and/or the accepting surgeons.

Follow PT, PTT, fibrinogen, and platelet count as a guide to treatment. The use of INR as a gauge of coagulopathy has not been deemed appropriate, because INR was originally developed using anticoagulated patient populations. Ensure that all medications that may interfere with coagulation or platelet function have been discontinued (e.g.: warfarin (Coumadin), aspirin, heparin,

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Coagulopathy/Thrombocytopenia¹ (cont.)

plavix/clopidogrel, and dipyridamole.

Treat aggressively with fresh frozen plasma (FFP) until PT and PTT are normal.

Begin with 2 units of FFP. (Fibrinogen will rise by 15 mg/dL for each unit of FFP.)

Repeat PT and PTT measurements at least 30 minutes after FFP infusion is completed.

Cryoprecipitate infusion is usually reserved for severe coagulopathy (fibrinogen <70 mg/dL).

Cryoprecipitate contains 10x more fibrinogen per volume than FFP.

Infuse 6 units cryoprecipitate by rapid infusion.

Repeat fibrinogen measurement at least 1 hour after cryoprecipitate infusion is completed.

Treat platelet count <30,000/mL³ in donors with evidence of active bleeding by transfusing 1 platelet pack (usually 5 or 6 individual units of platelets) rapidly.

Repeat platelet measurement at least 1 hour after infusion is completed.

Maintain Hct at or above 27% in hemodynamically unstable donors by transfusing PRBCs. One unit of PRBCs will raise Hgb by 1 gm/dL and Hct by 3-5%.

Blood Products/Colloids Administration

Crystalloid therapy is often the primary treatment for hypotension due to various forms of shock. The goal of such therapy should be treating the underlying cause, i.e. hypotension, hypovolemia, or diabetes insipidus. Regardless of cause, an immediate goal of fluid resuscitation is to restore adequate preload. If serial fluid challenges of crystalloid fail to correct intravascular volume losses, the use of colloid and or blood products may be indicated. Previous or continued blood loss must be evaluated, as well as the presence of coagulopathies assessed.

Specific colloid administration should be used judiciously. Albumin is often reserved for the treatment of third-spacing following massive fluid resuscitation and for rapid intravascular fluid expansion. Hespan and similar products should be used cautiously.

Anemia, as expressed by a Hct < 27%, should be treated and reassessed. In addition, abnormal coagulation studies, as well as thrombocytopenia, should be evaluated as previously discussed. The following information is a guideline for fluid/colloid therapies.

Blood Therapy Calculations

PRBC's ---1 unit should raise the Hct by 3%

FFP 1 unit is approx 200ml, dose at 15ml/kg an order for the number of FFP units as desired.

This provides all of the coagulation factors.

Cryoprecipitate 1 unit is 15 to 20 ml, dose usually 2 to 6 units / primarily used to replace fibrinogen, each unit used contains 250mg of fibrinogen and will raise fibrinogen .1 to .3umol/L

Platelets 1 pack 50 ml , dose 1 pack per 10 kg of donor weight , generally 1 pack should raise plt count 10 x 10 to the 9/L

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Lung/Heart-lung and Pulmonary management

Prevent pulmonary interstitial fluid overload.

Prefer PRBCs for volume expansion if needed.

Obtain O₂ challenge on 100% FiO₂ (set PEEP at 5 cm H₂O). Pre-oxygenate with 100% FiO₂ for 30 minutes, and then obtain ABG.

Assure adequate size ET tube for bronchoscopy. (Adults Size 7.5 or larger to facilitate bronchoscopy.)

Obtain bronchoscopy/ minimal lavage (< 10cc).

Obtain sputum for gram stain and C & S during bronchoscopy.

Obtain serial CXRs (prefer upright, if possible) (most recent of which is within 3 hours of offer).

Consult APC, Pulmonologist, Cardiothoracic Transplant Surgeon.

Inflate ETT cuff to at least 25cm H₂O pressure.

HOB to 30 degrees/frequent oral care/VAP (ventilator associated pneumonia) protocol.

Consider chest CT if history of smoking/inhalation of drugs/trauma or at surgeon/MD request.

Respiratory Insufficiency

Brain dead patients require mechanical ventilation, therefore, frequent pulmonary hygiene is recommended to prevent atelectasis and maintain adequate oxygenation. Positive end-expiratory pressure of 5 cm H₂O is helpful, but caution should be used with higher levels of sustained PEEP to minimize the potentially deleterious effects on venous return and cardiac output. Ventilator settings should include a tidal volume of 8 to 10 ml per kg and a respiratory rate sufficient to maintain arterial PaCO₂ in the 35 - 45 mm Hg range.

Lung recruitment may be instituted (see ORG 92 - Lung Recruitment Maneuvers)

The goals during mechanical ventilation are the following:

- A. Peak airway pressure (Peak AWP) < 30 cm H₂O
- B. Plateau airway pressure (Plat AWP) < 30 cm H₂O
- C. FIO₂ - lowest possible to maintain SpO₂ > 95% and PaO₂ > 100 mm Hg
- D. PEEP - minimum 5 cm H₂O, adjust to maintain PaO₂ > 100 mm Hg
- E. Auto PEEP - < 5 cm H₂O
- F. Arterial blood gas (ABG) values: pH 7.35 - 7.45; PaCO₂ > 35 mm Hg, < 45 mm Hg to maintain pH within goal range; PaO₂ > 100 mm Hg; HCO₃ not independently adjusted.

Hypoxemia

Arterial oxygen saturations should be maintained at > 95%.

PaO₂ levels should be > 100 mm Hg.

Hypoxemia should be treated aggressively to minimize injury to transplantable organs.

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Respiratory Insufficiency (cont.)

Hypoxemia Treatment (cont.)

Maintain hematocrit > 27%; transfuse PRBCs as necessary.

Turn and suction patient frequently.

Increase FiO₂ by increments of 10%, and then recheck ABG.

Diuretic therapy may be indicated if CXR is c/w pulmonary edema.

Consider pressure control ventilation.

Hypercapnia

Apnea testing, to confirm the diagnosis of brain death, can result in significant hypercapnia leading to respiratory acidosis. Careful attention should be paid to the patient's ventilatory status and ABGs, especially following apnea tests.

The ventilator rate should be increased as needed to normalize PaCO₂ levels in the 35 to 45 mm Hg range.

Liver / Pancreas

Prefer minimal or no pitressin therapy (to minimize vasoconstriction).

Avoid excessive crystalloid infusion (to minimize liver congestion).

Obtain serial LFTs, PT/PTT, amylase/lipase, & blood glucose as indicated; HgbA1c (if available).

Treat a PT > 18 (& corresponding INR) with 2 units FFP.

(See separate Glucagon protocol for cases in which MABI is the primary accepting center for the liver.)

Kidney

Maintain a brisk diuresis (urine output = 100 to 200 cc/hr).

Obtain urinalysis, urine C & S, Creatinine, & BUN.

Hyperglycemia

Hyperglycemia has been defined as a blood sugar level of 150 mg/dL (> 8.3 mmol/L).¹ Treatment of hyperglycemia should initially start by discontinuing dextrose-containing IV fluids. Insulin therapy may be necessary if the patient remains hyperglycemic 2 hours after discontinuing dextrose IVFs.

The dosage should be determined in consultation with the medical director on call, transplant surgeon, or it may be protocolized through the use of a sliding- scale as seen in Table 1.

Send a HgbA1C on patients with hyperglycemia on admission, or hyperglycemia not associated with IV dextrose therapy.

<u>Table 1</u>	<u>IV Insulin Scale ¹</u>
<u>GlucoseIV</u>	<u>Insulin</u>
<u>(mg/dL)</u>	<u>(units)</u>
<225	see SC insulin scale
226-250	5
251-275	8
276-300	10
>301	Consult MD

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Infectious Disease and thermoregulatory management

Poikilothermia

Loss of thermoregulatory function follows hypothalamic dysfunction in brain dead patients. Generally patients must be maintained at or above 95° F for valid brain death determination. Passive heat loss may lead to progressive hypothermia which in turn may result in clinically significant changes in organ function (EKG changes, depressed cardiac function, altered cellular metabolism, etc.) It is far easier to prevent hypothermia than to reverse it. Therefore, patient temperature should be carefully monitored and hypothermia should be treated early.

Treatment:

Maintain room temperature > 75° F

Keep body and head well covered; use warming blanket as needed

Heat IV fluids with blood warmer, if temperature < 95° F

Infection

On all donors the coordinator must review the patient's medical records for the potential of systemic or localized infections. This is accomplished by reviewing the medical and nursing progress notes as well as clinical and laboratory data. Pertinent clinical information will be past medical history, pre-hospital injuries or illness, surgical procedures during the admission, and a review of the patient's vital signs for the presence of fever. Laboratory data will include culture results, white blood cell, and differential blood counts.

As a general rule, Vancomycin and Zosyn should be administered to potential organ donors once they are declared brain dead. The dosage for Vancomycin should be 1 gram every 12 hours IV and for Zosyn, it should be 4.5 grams IV every 6 hours. Both medications may be adjusted depending on kidney function. In instances where patients are being treated prophylactically, or for specific infection, those antibiotic treatments should be continued in consultation with the medical director on call or transplant surgeon. In some instances an Infectious Disease consult may be requested at the donor hospital.

Donor Instability Escalation Guidelines

If the donor exhibits instability such as Hypotension, Hypoxia, Cardiac Dysrhythmias or Severe Electrolyte imbalance – K+, the Donation Coordinator (DC) will advise the Clinical Director on Call (CDOC)/and/ or if the Advanced Practice Donation Specialist (APDS) is involved in the management they (APDS) will contact the CDOC in collaboration with the DC on site to determine whether to continue with the allocation and plan for recovery or to proceed with an expedited recovery.

If the decision is to proceed with expedited recovery an Expedited Recovery Plan (ERT) may be activated as needed.

Documentation:

Detailed documentation of the changes in the donor's stability will be recorded in the DonorNet highlight section.

Updates (by designated DC/CDOC/OCC) will be provided to centers that have accepted the organs with documentation who received the update – coordinator/surgeon with plan.

Collaboratively, the CDOC, DC and OCC will document the allocation plan: detailed plan for recovery or to proceed with an expedited recovery.

Organs have been allocated plan:

If the organs have been allocated the CDOC will contact the AMD to determine if an offer will remain or be rescinded based on the donor's stability.

Collaboratively, the CDOC, DC and AMD will determine whether to continue with the allocation and plan for recovery or to proceed with an expedited recovery.

References

1. Guidelines 2000 for Cardiopulmonary Resuscitation and Emergency Cardiovascular Care. The American Heart Association in Collaboration with the International Liaison Committee of Resuscitation.
2. Powner DJ, Darby JM, Kellum JA. Proposed treatment guidelines for donor care. *Progress in Transplant* 2004; 14:16-26.
3. Shihab FS, Metabolic Complications, *Primer on Transplant* 2nd Edition, American Society of Transplantation; 2001:247-256.