It is important to take the time necessary in the Intensive Care Unit (ICU) to optimize multi-organ function for the purposes of improving transplant outcomes. Resuscitation and re-evaluation can improve reversible organ dysfunction (myocardial/cardiovascular dysfunction, oxygenation impairment related to potentially reversible lung injury, invasive bacterial infections, hypernatremia or any other potentially treatable situation) and can allow the evaluation of temporal trends in aspartate aminotransferase (AST), alanine aminotransferase (ALT) or creatinine. This treatment period can range from 12–24 hours and should be accompanied by frequent re-evaluation to demonstrate improvement in organ function toward defined targets. Once optimized, donors should have surgical procurement procedures arranged emergently.

There are no predefined demographic factors or organ dysfunction thresholds that preclude the consent for donation and offering of organs for transplantation.

**Standard Monitoring**
1. Urine catheter to straight drainage, strict intake and output
2. Nasogastric tube to straight drainage
3. Vital signs q1h
4. Pulse oximetry, 3-lead electrocardiogram (EKG)
5. Central venous pressure monitoring
6. Arterial line pressure monitoring
7. ± Pulmonary arterial catheterization.

**Laboratory Investigations**
1. Arterial blood gas (ABG), electrolytes, glucose q4h and as needed (PRN)
2. CBC q8h
3. Blood urea nitrogen (BUN), creatinine q6h
4. Urine analysis
5. AST, ALT, bilirubin (total and direct), internal normalized ratio (INR) (or prothrombin time [PT]), partial thromboplastin time (PTT) q6h.

**Hemodynamic Monitoring and Therapy**

**General targets:**
1. Heart rate $\geq 60 \leq 120$ bpm, systolic blood pressure (BP) $> 100$ mmHg, mean arterial pressure (MAP) $\geq 70$ mmHg
2. Fluid resuscitation to maintain normovolemia, central venous pressure (CVP) 6–10 mmHg
3. If arterial blood pressure (ABP) ≥ 160/90 then:
   a. Wean inotropes and vasopressors, and, if necessary
   b. Start
      – nitroprusside 0.5–5.0 µg/kg/min, or
      – esmolol 100–500 µg/kg bolus followed by 100–300 µg/kg/min
4. Serum lactate q2–4h
5. Mixed venous oximetry q2–4h; titrate therapy to mixed venous oxygen (MVO₂) ≥ 60%.

**Agents for Hemodynamic Support**
1. Dopamine ≤ 10 µg/kg/min
2. Vasopressin ≤ 2.4 units/hour (0.04 units/minute)
3. Norepinephrine, epinephrine, phenylephrine (caution with doses > 0.2 µg/kg/min).

**Indications for Pulmonary Arterial Catheterization**
1. 2D echo ejection fraction ≤ 40% and/or
2. Dopamine >10 µg/kg/min (or equivalent) and/or
3. Vasopressor support (not including vasopressin if part of hormone therapy) and/or
4. Escalation of supports.

**Glycemia and Nutrition**
1. Routine intravenous (iv) dextrose infusions
2. Initiate or continue enteral feeding as tolerated
3. Continue parenteral nutrition if already initiated
4. Initiate and titrate insulin infusion to maintain serum glucose 4–8 mmol/L.

**Fluid and Electrolytes**

Targets:
1. Urine output 0.5–3 ml/kg/hr
2. Serum sodium (Na) ≥ 130 ≤ 150 mM

**Diabetes Insipidus**

Defined as:
1. Urine output > 4 ml/kg/hr, associated with
   a. Rising serum Na ≥ 145 mmol/L and/or
   b. Rising serum osmolarity ≥ 300 mosM and/or
   c. Decreasing urine osmolarity ≤ 200 mosM.

Diabetes insipidus therapy:
1. Titrate therapy to urine output ≤ 3 ml/kg/h
   a. iv vasopressin infusion ≤ 2.4 units/hour, and/or
   b. Intermittent 1-desamino-D-arginine vasopressin (DDAVP) 1–4 µg iv then 1–2 µg iv q6h.
**Combined Hormonal Therapy**

Defined as:
1. Tetra-iodothyronine (T₄) 20 μg iv bolus followed by 10 μg/hour iv infusion (or 100 μg iv bolus followed by 50 μg iv bolus q12h)
2. Vasopressin 1 unit iv bolus followed by 2.4 Units/hour iv infusion
3. Methylprednisolone 15 mg/kg (≤ 1 gm) iv q24h.

Indications:
1. 2D echocardiographic ejection fraction ≤ 40%, or
2. Hemodynamic instability (includes shock unresponsive to restoration of normovolemia and requiring vasoactive support [dopamine >10 μg/min or any vasopressor agent])
3. Consideration should be given to its use in all donors.

**Hematology**
1. Hemoglobin (Hgb): optimal ≥ 90–100 g/L for unstable donors, lowest acceptable ≥ 70 g/L
2. Platelets, INR, PTT: no predefined targets, transfuse in cases of clinically relevant bleeding
3. No special transfusion requirements.

**Microbiology (baseline, q24h and PRN)**
1. Daily blood cultures
2. Daily urine cultures
3. Daily endotracheal tube (ETT) cultures
4. Antibiotics for presumed or proven infection.

**Heart Specific**
1. 12-lead EKG
2. Troponin I or T, q12h
3. 2D echocardiography
   a. Should only be performed after fluid and hemodynamic resuscitation
   b. If 2D echo ejection fraction ≤ 40% then,
      - insert pulmonary arterial catheter (PAC) and titrate therapy to the following targets:
        - pulmonary capillary wedge pressure (PCWP) 6–10 mmHg
        - cardiac index (CI) > 2.4 L/min-m²
        - systemic vascular resistance (SVR) 800–1200 dynes/sec-cm⁵
        - left ventricular (LV) stroke work index > 15 g/kg-min
      - PAC data is relevant for hemodynamic therapy and evaluation for suitability of heart transplantation independent of echo findings
   c. Consider repeat echocardiography at q6–12h intervals.
4. Coronary angiography
   Indications:
   a. History of cocaine use
   b. Male > 55 yrs or female > 60 yrs
   c. Male > 40 yrs or female > 45 yrs in the presence of ≥ two risk factors
   d. ≥ 3 risk factors at any age.
Risk factors:
1. smoking
2. hypertension
3. diabetes
4. hyperlipidemia
5. body mass index > 32
6. family history
7. prior history of coronary artery disease
8. ischemic EKG
9. anterolateral regional wall motion abnormalities on echo
10. 2D echocardiographic ejection fraction ≤ 40%.

Precautions:
1. Ensure normovolemia
2. Prophylactic N-acetylcysteine 600–1000 mg enterally bid (1st dose as soon as angiography indicated) or iv 150 mg/kg in 500 ml normal saline (NS) over 30 minutes immediately before contrast followed by 50 mg/kg in 500 ml NS over 4 hrs
3. Low-risk radiocontrast agent (non-ionic, iso-osmolar), using minimum radiocontrast volume, no ventriculogram.

Lung Specific
1. Chest x-ray q24h and PRN
2. Bronchoscopy and bronchial wash gram stain and culture
3. Routine ETT suctioning, rotation to lateral position q2h
4. Mechanical ventilation targets:
   a. Tidal volume (Vt) 8–10 ml/kg, positive end expiratory pressure (PEEP) 5 cm H2O, peak inspiratory pressure (PIP) ≤ 30 cm H2O
   b. pH 7.35–7.45, partial pressure of arterial carbon dioxide (PaCO2) 35–45 mmHg, partial pressure of arterial oxygen (PaO2) ≥ 80 mmHg, oxygen (O2) sat ≥ 95%.
5. Recruitment maneuvers for oxygenation impairment may include:
   a. Periodic increases in PEEP up to 15 cm H2O
   b. Sustained inflations (PIP @ 30 cmH2O x 30–60 sec)
   c. Diuresis to normovolemia.