

Living Donor Laparoscopic Nephrectomy Anesthesia Pearls

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(Please also refer to the “UCSF Living Donor Nephrectomy pathway” document for a summary of the complete multidisciplinary pathway, also under “Clinical Resources” – “Living Donor Nephrectomy”)

Patient demographics:

Donor nephrectomies are performed in healthy donors who are donating one of their kidneys to someone with end stage kidney disease, frequently a family member (living-related donor) or friend (living-unrelated donor). Living kidney donations are critical to increase the limited supply of available organs. Living donor kidney recipients benefit from improved outcomes, due to minimal cold ischemia time, and optimized timing of transplantation (often before they require dialysis).

Some patients participate in a paired kidney exchange in which a donor who is crossmatch incompatible with the intended recipient is paired with another incompatible donor-recipient pair. This allows to “swap” kidneys and to donate the kidney to the recipient in the other pair. Paired donations may both occur at UCSF or via an interinstitutional exchange. This can necessitate surgery outside of regularly scheduled block time depending on organ transportation and OR time at the other institution.

Pre-op assessment:

Living donors are classically ASA 1-2 patients. Most will have had an extensive pre-op workup beyond what is expected for otherwise healthy patients (e.g., full set of labs) because these are high risk cases in patients who would not otherwise be undergoing surgery.

In addition to the full anesthesia consent, patients should be consented for an intraoperative ultrasound – guided transverse abdominis plane (TAP) block. Please reach out to the regional anesthesia team prior to start of case to confirm the plan for intraoperative TAP block (usually performed at the end of the case, but occasionally performed before incision).

Blood Products: confirm type and cross. RBC x 2 should be in the room – for the very unlikely event of vascular injury - although blood loss is typically minimal (less than 100 cc).

Pre-op meds: Acetaminophen 1000mg PO once and naloxone 4mg PO once to be given in preop holding area. Consider PONV prophylactic agents as needed for high-risk patients.

Pre-induction timeout:

A pre-induction timeout with both the surgery and anesthesia attending present is required. It is okay for the patient to receive midazolam for anxiolysis prior to the pre-induction timeout. Per definition, anesthesia can only be induced after the pre-induction timeout.

Intraoperative plan:

GETA with an expected surgical duration of about 3 hours. Standard induction and maintenance with volatile anesthetic or TIVA. Goal to maintain patient temperature >36.0° C. An OG tube should be inserted prior to abdominal insufflation.

Monitoring/Access: Standard ASA monitors with second PIV (18g or 16g to treat acute blood loss in case of vascular injury) + hotline (do not omit) No arterial line or CVC. Please draw a purple top tube when placing the second PIV.

Required Blood Sample collection: As part of a regulatory requirement, all donors need to have a purple top tube of blood drawn prior to incision. This tube can be handed to nursing staff who will label tube and make sure it is stored in proper area. Verification of this sample collection will be done during the final time-out.

Urine output will be monitored via foley catheter and recorded every 15 minutes by the circulating nurse.

Antibiotic prophylaxis: Cefazolin 2g is mainstay. Alternatives in case of patient allergies should be discussed during timeout.

Opioids: Fentanyl is the mainstay of intraoperative opioid therapy but should be minimized (<3-4mcg/kg total as a guide). Long-acting opioids such as morphine or hydromorphone should be avoided.

Anti-emetics: Dexamethasone 10mg IV after induction for anti-emetic and analgesic effects. Ondansetron 4mg IV at end of case. Consider additional agents as indicated by risk factors.

Positioning: Flexed, modified lateral decubitus position with the flank at approximately 45° to the table and the ipsilateral arm crossing above the patient. Please pay careful attention to positioning and padding of pressure points (face, eyes, ears, neck position, brachial plexus, knees, and heels).

Fluids: Fluid goals typically range from about 30-50 mL/kg total and can be modified intraoperatively based on *hemodynamic* and surgical goals. Balanced electrolyte solutions (i.e. PlasmaLyte) are the fluid of choice.

Special medications: Several key medications are given during this case. During dissection, the surgeon will request IV **mannitol 25g** in 2 or 3 divided doses (varies by surgeon, discuss at timeout): usually 6.25g x 2 after incision and mid-way (or 12.5g x 1) and 12.5 g x 1 just prior to clamping of the renal artery and IV **furosemide 20mg** just prior to cross-clamp.

Mannitol should be administered via an infusion pump with inline filter tubing. Please adjust the infusion speed of the third dose to ensure completion prior to clamping of the renal artery. Mannitol vials should be checked for crystal precipitation prior to use. Always double check the PIV during mannitol administration for signs of infiltration, as infiltration of mannitol can be catastrophic.

Prior to vascular clamping, the surgeon will request administration of **IV heparin** (usually 3000-5000 units). Please ensure that **protamine** is in the room prior to heparin administration. Following removal of the kidney, systemic heparinization will be reversed with protamine. Protamine (usual dose 30 – 50mg) should be administered slowly over several minutes. Communicate with surgeon as you are giving these medications. Furosemide, mannitol, heparin, and protamine doses, as well as overall fluid goals should be discussed with surgeon during timeout.

Special Medications Summary:

Mannitol 25g + Filter & Furosemide (100mg vial) will be provided by the anesthesia tech

Heparin is in the anesthesia cart

Protamine (5cc vial, 10mg/cc) will be provided by the circulating RN (from the Pyxis)

Bupivacaine: The regional anesthesia team will order, pick up and mix the LA solution (currently a mix of plain and liposomal bupivacaine)

Emergence:

Plan to extubate and transfer to PACU. Please page or call the regional anesthesia team during closure for TAP block prior to emergence (unless the block was performed after induction). Neuromuscular blockade reversal should be given preferably after TAP block. Consider ketorolac 15mg. (Discuss with surgeon prior to administration).

To suggest any modifications to this document please email kate.kronish@ucsf.edu

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