A Proposal to Examine the Effects of Two Interventions toReduce Perioperative Blood Loss among Older Adults Undergoing Total Hip Arthroplasty

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BACKGROUND/PROBLEM

- Total hip arthroplasty (THA) is associated with substantial intraoperative & postoperative blood loss
- Among top 10 surgeries with the highest incidence of blood product transfusions
- Frequency of THA expected to rise dramatically over the next 2 decades due to increasing number of older adults
- Two ways to reduce perioperative blood loss: administration of erythropoietin or tranexamic acid (TXA) using blood salvage, and hemodilution
  - Controlled hypotension (CH) with remifentanil infusion TXA, a newer, widely used antifibrinolytic
- Limited studies compared outcomes using these two techniques (CH + TXA) together

RESEARCH QUESTION

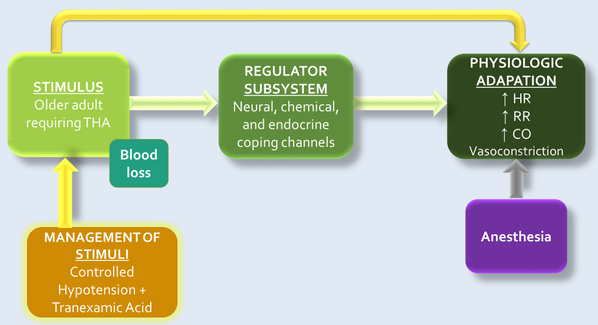
Does the addition of CH w/ remifentanil infusion further reduce intraoperative and postoperative blood loss and transfusion requirements in total hip arthroplasty?

HYPOTHESIS

The use of CH and TXA intraoperatively will result in greater reductions in blood loss & transfusion incidence compared to a group receiving TXA and remaining normotensive (NT).

CONCEPTUAL FRAMEWORK

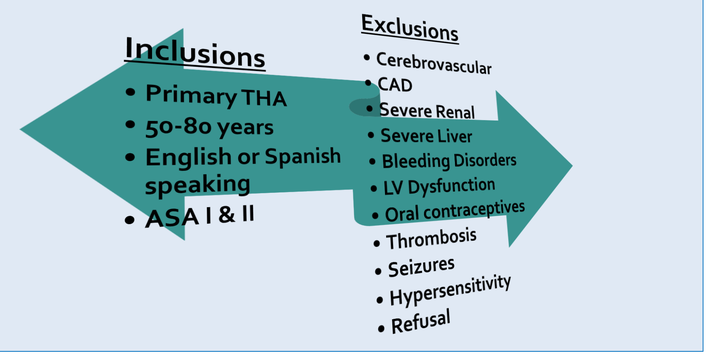
Figure 1. Conceptual Framework. Roy's Adaptation Model



METHODS

- **Design**: Randomized controlled study design
- **Sampling**:
  - Two groups of 36
  - Meets inclusion and exclusion criteria (Figure 2)
  - Qminim, a computer based randomization and minimization program will be used for group assignment of study participants

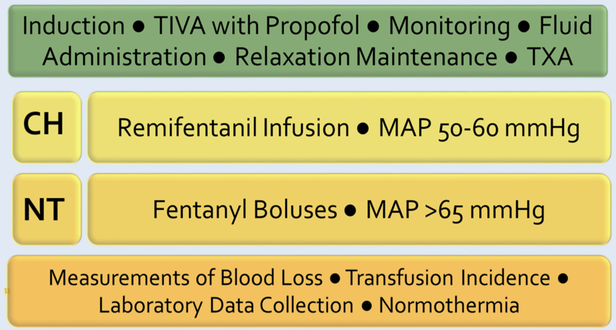
Figure 2. Inclusion and Exclusion Criteria



- **Setting**: Two university affiliated medical centers
- **Study Procedure (Figure 3):**
  - All subjects will receive total intravenous anesthesia (TIVA) with propofol (50-250 mcg/kg/min) and TXA bolus (15 mg/kg) before incision and continuous infusion (1.0 mg/kg/hr) during the procedure.
  - Subjects will be randomly assigned into two groups: the CH group and the normotensive (NT) group.
    - CH group: will received TIVA with remifentanil infusion (0.5 to 3 mcg/kg/min) titrated to maintain a mean arterial pressure (MAP) between 50-60 mmHg (or 30% of subject's baseline MAP).
    - NT group: will only receive TIVA and their MAP will be maintained above 65 mmHg by titration of anesthetic and/or use of vasopressors.

METHODS Cont'd

Figure 3. Study Procedure



- **Data Collection:**
  - **Blood Loss**
    - **Intraoperative -** measured as follows:
      - Amount of blood in the suction canisters
      - Quantity weight of saturated lap pads
      - Estimation of blood around the surgical area
    - **Postoperative** - blood accumulated in surgical drains
  - **MAP -** continuously monitored and recorded via radial artery catheter transducer.
  - **Other relevant data:** blood laboratory results, transfusion incidence, temperature, complication incidence, and surgical data

CONCLUSION

If results reveal better outcomes in the CH+TXA group, the use of both these techniques together may provide the best method to reduce blood loss

References available upon request