Title: Continuous Erector Spinae Plane Blocks for Analgesia and Improving Incentive Spirometry Following Traumatic Rib Fractures

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UCSD Human Research Protections Program
New Biomedical Application
RESEARCH PLAN

Instructions for completing the Research Plan are available on the HRPP website.
The headings on this set of instructions correspond to the headings of the Research Plan.
General Instructions: Enter a response for all topic headings.
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Version date: 9/30/2013

1. PROJECT TITLE

Patient-Titrated Automated Intermittent Boluses of Local Anesthetic vs. a Continuous Infusion *via* a Perineural Catheter for Postoperative Analgesia

2. PRINCIPAL INVESTIGATOR

Brian M. Ilfeld, MD, MS

3. FACILITIES

UCSD Hillcrest Hospital, Koman Outpatient Pavilion, and Jacobs Medical Center

4. ESTIMATED DURATION OF THE STUDY

Three years

5. LAY LANGUAGE SUMMARY OR SYNOPSIS (no more than one paragraph)

Continuous peripheral nerve blocks (cPNB) provide prolonged pain relief after surgical procedures, allowing for decreased opioid consumption and improved quality of life.[1-3] There are three general methods—frequently combined—for dosing of local anesthetic in cPNB: continuous infusion, patient administered boluses, and automated intermittent boluses. To date, nearly all trials involving ultrasound-guided catheter insertion have failed to detect analgesic superiority of one administration modality over the other with equivalent hourly local anesthetic volume and dose.[4-15] However, we recently completed an IRB-approved randomized, controlled trial at UCSD suggesting that automated intermittent boluses may provide a longer duration of treatment—thus prolonging analgesia—for ambulatory patients having painful foot and ankle orthopedic procedures (200247). While the pump would allow patients to administer additional, non-automated boluses to supplement the programmed automated intermittent boluses if they experienced pain, it did not permit patients to decrease the amount of local anesthetic they were receiving. And it appeared that many patients were receiving more local anesthetic than they required.

The FDA-cleared portable infusion pump used in that study (Infutronix, Natick, Massachusetts) now has a new and novel feature which will potentially improve the patient experience: it is now possible for patients to easily self-titrate the volume of local anesthetic administered with each automatic bolus. Using this feature, patients can increase or decrease the amount of local anesthetic they receive and titrate within a physician-specified range to their level of pain.

In the United States, the vast majority of forearm fractures as well as foot and ankle surgery is now performed on an outpatient basis. ***For ambulatory patients who are discharged home with a set local anesthetic reservoir volume, decreasing the rate of anesthetic consumption will allow prolonging the continuous peripheral nerve block and therefore analgesia.*** In other words, even if automated repeated boluses provide equivalent analgesia compared with a continuous peripheral infusion, the automated bolus dose method will be superior if it consumes less local anesthetic thereby permitting a longer analgesic treatment. In the outpatient arena, titratable automated intermittent boluses offer two different opportunities to improve postoperative pain control: (1) improved analgesia in the initial days following surgery; and, (2) improving analgesia by allowing prolonged administration past the time at which a continuous infusion would have exhausted the anesthetic reservoir.

6. SPECIFIC AIMS

Specific Aim: To determine the relationship between method of local anesthetic administration (continuous with

PCA vs. titratable intermittent dosing with PCA) for continuous peripheral nerve block and the resulting pain control.

Hypothesis: We hypothesize that, compared with a traditional ***fixed***, ***continuous basal infusion initiated prior to discharge***, perineural local anesthetic administered with titratable ***automated boluses at a lower dose and a 5-hour delay*** following discharge will (1) provide at least noninferior analgesia during the period that both techniques are functioning; and, (2) will result in a longer overall duration of administration [dual primary end points].

7. BACKGROUND AND SIGNIFICANCE

Continuous peripheral nerve blocks: In the postoperative setting, pain is a primary concern of patients and healthcare providers. Over 40% of ambulatory patients undergoing orthopedic procedures experience moderate-to-severe postoperative pain at home. A single-injection peripheral nerve block provides up to 15 and 24 hours of analgesia following upper and lower extremity procedures, respectively. However, following this initial period, patients must rely on other, less potent, analgesics such as oral and intravenous opioids.[1] A continuous peripheral nerve block (CPNB)—also called perineural local anesthetic infusion—offers an alternative analgesic option. This technique involves the percutaneous insertion of a catheter directly adjacent to the peripheral nerve(s) that innervate the surgical site at the same time the initial regional block is placed. During the past decade, ultrasound-guided catheter placement has also become the common method for placing perineural catheters.[1] Using this technique, the peripheral nerve(s) is visualized in real-time using ultrasound, and then the catheter is placed directly adjacent to the nerve(s), also under real-time ultrasound guidance.

Local anesthetic infusion methods: There are three general methods—frequently combined—for dosing of local anesthetic in CPNB: continuous infusion, patient administered boluses (PCA), and automated intermittent boluses. Automated intermittent boluses with PCA has been shown to be superior to continuous infusion with PCA for patients undergoing painful foot surgeries when the perineural catheter is placed using nerve stimulation for needle placement followed by blind insertion of a non-stimulating perineural catheter.[2] However, in the past decade ultrasound guidance has overwhelmingly become the dominant modality for administering peripheral nerve blocks and inserting perineural catheters. To date, nearly all trials involving ultrasound-guided catheter insertion have failed to detect analgesic superiority of one administration modality over the other with equivalent hourly local anesthetic volume and dose.[1-12] However, we recently completed an IRB-approved randomized, controlled trial at UCSD suggesting that automated intermittent boluses may provide a longer duration of treatment—thus prolonging analgesia—for ambulatory patients having painful foot and ankle orthopedic procedures (200247). While the pump would allow patients to administer additional, non-automated boluses to supplement the programmed automated intermittent boluses if they experienced pain, it did not permit patients to decrease the amount of local anesthetic they were receiving. And it appeared that many patients were receiving more local anesthetic than they required.

The FDA-cleared portable infusion pump used in that study (Infutronix, Natick, Massachusetts) now has a new and novel feature which will potentially improve the patient experience: it is now possible for patients to easily self-titrate the volume of local anesthetic administered with each automatic bolus. Using this feature, patients can increase or decrease the amount of local anesthetic they receive and titrate within a physician-specified range to their level of pain. The Nimbus pump manufactured by Infutronix has 510(k) clearance for the following indications: "To deliver medications and/or fluids to a patient under the direction or supervision of physician or other certified healthcare professional in clinical or nonclinical environments, such as homes. The device is intended for subcutaneous, percutaneous, perineural, epidural and intravenous infusion, including but not limited to patient controlled analgesia (PCA) delivery." The following precautions are provided by the manufacturer:

- Only use pump as directed by physician or other certified health care professional.
- The pump is not to be used for delivery of blood or cellular blood products.
- The pump is not intended for delivery of life-sustaining medication.
- Do not use the pump or cassette/administration set to administer any infusion to the epidural space unless the medication and/or fluid infused is indicated for epidural administration.
- If the pump is used to deliver critical medication, a backup pump should be available.
- Do not use the pump in or near an MRI (Magnetic Resonance Imaging) device.

In the United States, the vast majority of forearm fracture as well as foot and ankle surgery is now performed on an outpatient basis. For ambulatory patients who are discharged home with a set local anesthetic reservoir volume, decreasing their hourly consumption of anesthetic will allow prolonging their continuous peripheral nerve block and therefore their analgesia. In other words, even if automated repeated bolus doses provide equivalent analgesia as a continuous peripheral infusion, the automated bolus dose method will be superior if it consumes less local anesthetic, thereby permitting a longer analgesic treatment. In the outpatient arena, titratable automated intermittent boluses offer two different opportunities to improve postoperative pain control: (1) improved analgesia in the initial days following surgery; and, (2) improving analgesia by allowing prolonged administration past the time at which a continuous infusion would have exhausted the anesthetic reservoir.

8. PROGRESS REPORT

Not applicable.

9. RESEARCH DESIGN AND METHODS

This will be a randomized, controlled investigation.

Table of Events

Postoperative Day	Experimental?	Event
0	Yes	Written, informed consent
0	No	Anthropometric information collected
0	No	Ultrasound-guided popliteal-sciatic perineural catheter insertion
0	No	Single-injection peripheral nerve block with ropivacaine 0.5%
0	Yes	Randomization
0	No	Ropivacaine 0.2% perineural local anesthetic administration begins
0	Yes	Local anesthetic administered as basal or programmed bolus doses
1-9	Yes	Patients contacted by phone to collect data
5-8	Yes	Perineural catheters removed with reservoir exhaustion or Day 8

Enrollment: Consenting adults undergoing ulnar and/or radius fracture open reduction internal fixation or painful foot and/or ankle surgery with a planned infraclavicular or popliteal-sciatic perineural catheter insertion, respectively, will be offered enrollment. Study inclusion will be proposed to eligible patients prior to surgery. If a patient desires study participation, written, informed consent will be obtained using a current UCSD IRB-approved ICF. Selection for inclusion will not be based on gender, race, or socioeconomic status. The study population of interest includes men and women of all races and socioeconomic status. Inclusion and exclusion criteria are listed in section #10 below.

Preoperative Procedures:

SOC (mandated for study purposes): Following written, informed consent, subjects will have baseline anthropometric information (e.g., age, sex, height, weight) collected and a sciatic perineural catheter inserted by a regional anesthesia fellow or resident under the direct supervision and guidance of a regional anesthesia attending (or by the attending him/herself).
Per standard of care, all subjects will have an ultrasound-guided infraclavicular or popliteal-sciatic perineural catheter inserted as previously described.

SOC (mandated for study purposes): After catheter insertion, ropivacaine 0.5% (20 mL, with epinephrine) will be administered via the catheter under ultrasound visualization. Sensation in the brachial plexus or tibial/peroneal nerve distributions will be checked for anesthetic effect. A "successful" regional block will be defined as sensory- and motor-block onset within the 30 minutes following the local anesthetic injection.

A saphenous nerve block with ropivacaine 0.5% (and epinephrine) may or may not be provided, depending on the surgical procedure, *per standard of care*.

Intraoperative:
The initial local anesthetic bolus may provide complete surgical anesthesia for the procedure. Patients who desire a general anesthetic or experience a partial block that is not adequate for surgical anesthesia will receive a general anesthetic, *per standard of care*.

Randomization:
Experimental: Subjects will be randomized to one of two treatment groups: (1) ***titratable automated intermittent bolus*** or (2) ***continuous infusion*** in a computer generated 1:1 ratio using opaque envelopes opened only after successful catheter insertion is documented within 30 minutes of the local anesthetic injection.

Postoperative Procedures:
SOC (mandated for study purposes): Following completion of the procedure in the operating room, an infusion pump (Infutronix, Natick, Massachusetts) with a 500 mL ropivacaine 0.2% reservoir will be attached to the perineural catheter. For patients in the ***continuous infusion*** group, the pump will provide an 8 (infraclavicular) or 6 (sciatic) mL/h basal infusion and a 4 mL patient-controlled bolus with a 30-minute lockout (standard at UCSD).

Experimental: For patients in the ***titratable automated intermittent bolus*** group, the pump will provide an automatic 11 (infraclavicular) or 8 (sciatic) mL bolus once every 2 hours and have a 4 mL patient-controlled bolus with a 30 minute lockout. In addition, for those in the **titratable automated intermittent bolus** group, the infusion pump will be set in a "pause" mode that delays initiation of the automated bolus doses by 5 hours (this can be over-ridden by patients if they would like to initiate their perineural infusion earlier than 5 hours). Lastly, subjects in the **titratable automated intermittent bolus** group will be able to titrate the volume of their automated bolus up or down within the range of 1-16 mL.

Per standard of care, the pump will not administer more than 20 mL during each hour (below the current UCSD maximum). Prior to discharge, the functioning of the infusion pump will be explained, so that they understand that they should push the bolus button if they have pain. This is accurate regardless of which treatment group the patient is randomized to, ensuring that all subjects will receive adequate analgesia.

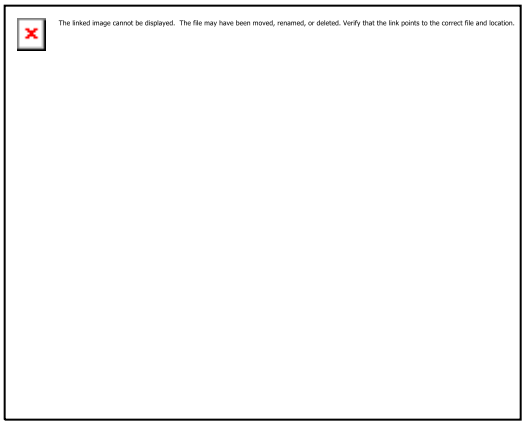
Experimental: Subjects will be contacted via phone for the 9 days following surgery to collect information regarding surgical pain (Numeric Rating Scale of 0 to 10, with "0" being no pain and "10" being the worst pain ever experienced), analgesic use, sleep disturbances, infusion side effects, and satisfaction with pain control. When 500 mL has been infused or on Day 8—whichever comes first—subjects will remove the catheter and

place the pump in a pre-addressed and -stamped package for return [note that it is standard of care for patients to remove the catheters at home; but, listed as experimental here due to the timing of catheter removal which will be later than is standard of care due to the experimental local anesthetic administration protocol].

Data Acquisition [*all experimental*]:
Data will be gathered from the patients' electronic medical record, by telephone follow-up, and from the memory of each infusion pump. Subjects will be contacted by phone for the 9 days following surgery. Data will be recorded on paper Case Report Forms, including: patient name, medical record number, age, sex, height, weight, surgical procedure, data of procedure, anesthesiology attending overseeing/placing catheter, randomization number, whether a femoral/saphenous block was placed, if the catheter was placed per protocol, if the block set up successfully, intraoperative fentanyl, morphine and dilaudid, and the time of infusion initiation.

Outcomes (End Points): For the first 9 postoperative days, subjects will be asked to answer the questions with regard to the previous 24 hours: opioid consumption, worst pain, average pain, least pain, current pain (Numeric Rating Scale for all pain scores), any numbness on extremity (scale 0=absent to 10=insensate), fluid leakage (yes/no), number of sleep disturbances due to pain (awakenings), satisfaction with analgesia (0=very dissatisfied, 10=very satisfied), the bolus volume for subjects in the titration group, and the seven questions of the Brief Pain Inventory's Interference Scale. The date and time of infusion completion will be recorded as will the reason for catheter removal (reservoir exhaustion vs. another reason).

Statistics: The infraclavicular and popliteal-sciatic groups will be analyzed separately as two distinct analyses. This study will be powered for two primary end points: (1) the average NRS queried on postoperative day 1; and (2) the duration of treatment from when the infusion pump was initially turned on until the local anesthetic reservoir was exhausted [recorded by the infusion pump memory]. The dual hypotheses will be tested with a serial testing strategy, such that Hypothesis 2 will not be formally tested unless the conclusion of Hypothesis 1 is at least "noninferiority". Following the approach described in Althunian et al, noninferiority will be assessed by comparing the lower limit of the 95% confidence interval for the difference (CB minus AB) on the NRS (range: 0 to 10) to a pre-specified noninferiority margin of 1.7 NRS units (see Figure 1). This will provide evidence that the analgesia provided by the novel automated boluses is no worse than 1.7 NRS units compared to CB.



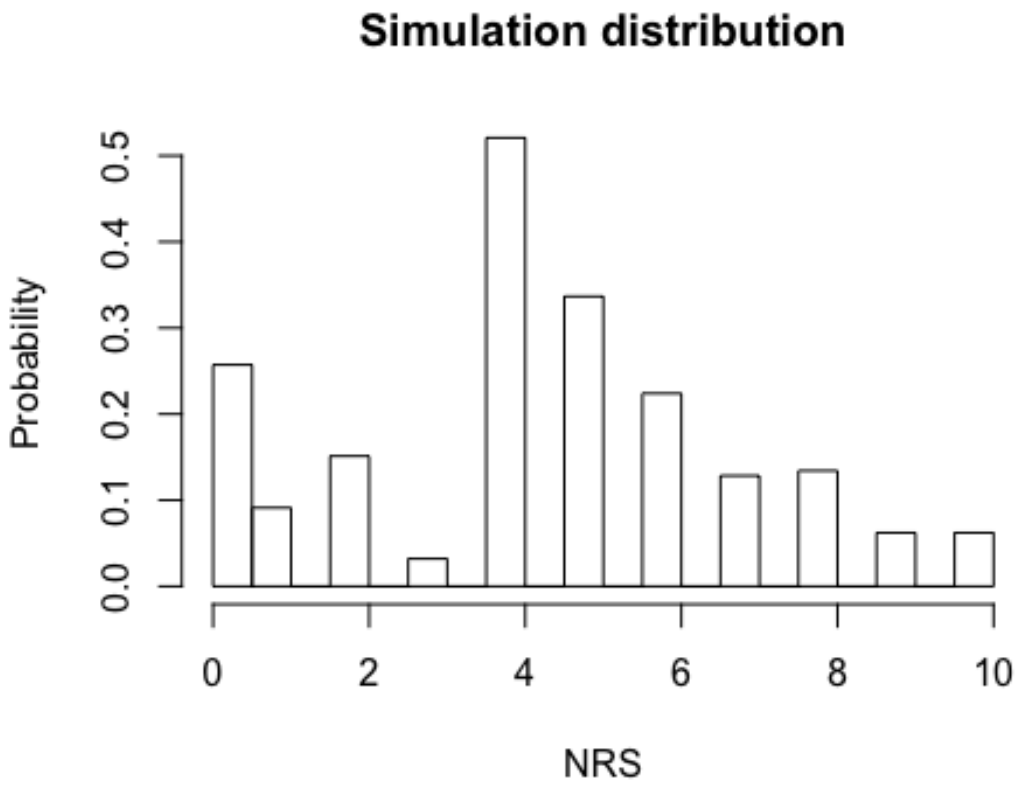
Noninferiority margin and framework for concluding noninferiority or not. Adapted from Althunian et al.

Baseline characteristics of the randomized groups will be summarized with means, standard deviations, and quartiles. Balance between groups will be assessed following the approach described by Schober, et al.

Specifically, standardized differences will be calculated using Cohen's d whereby the difference in means or proportions is divided by the pooled standard deviation estimates. Any key variables (age, sex, height, weight, and BMI) with an absolute standardized difference >0.47 (based on Austin, 2009 with $1.96\times\sqrt{(2/n)}=0.47$) will be noted and included in a linear regression model to obtain an estimate of the treatment group differences adjusted for the imbalanced covariate(s). If residuals from the linear regression indicate violations of key assumptions (i.e. homoscedasticity or Guassian distribution), data transformations and/or alternative generalized linear models will be applied as appropriate.

Secondary outcomes will also be analyzed by Wilcoxon-Mann-Whitney test, or linear models (or generalized linear models) as appropriate with covariates for any imbalanced covariates. No multiplicity adjustments will be applied for these analyses. End points will be analyzed for each day (e.g., opioid consumption on Day 2) as well as all days combined (e.g., cumulative opioid consumption Days 1-9).

Sample size estimate: Power is simulated based on the distribution of pain measured with the Numeric Rating Scale (NRS) observed in the "Above bifurcation" group in Monahan, et al. (*Anesth Analg* 2016;122:1689-95) for the sciatic catheter group. For the infraclavicular group, we simulated NRS scores from the basal/bolus treatment from Ilfeld et al. (*Anesthesiology* 2004;100:395-402). Specifically, we simulate NRS scores from a discrete distribution as depicted in Figure 1, panel A (infraclavicular) and Figure 2 (sciatic). This results in an expected interquartile range of approximately 1 to 4, and a median of approximately 3 NRS units. We simulated 1000 trials in which the two groups, n=35 per group, were assumed to follow the same discrete distribution, submitted each trial to a Wilcoxon-Mann-Whitney test, and derived 95% confidence intervals (Bauer 1972; Hothorn, et al. 2008). Out of the 1000 trials, 792 (79.2%) correctly resulted in a conclusion of non-inferiority; suggesting that the probability that the trial correctly concludes non-inferiority is about 80% when the groups follow exactly equivalent distributions.



Discrete distribution used for simulations based on the distribution observed in the Above Bifurcation group in Monahan, et al.

If the test for Hypothesis 1 concludes noninferiority (scenario A, B, or C in Figure 1), we will test for a difference in overall duration of administration again using the Wilcoxon-Mann-Whitney test.

Power is approximated by a two-sample t-test calculation. Assuming a standard deviation of SD=37 hours (corresponding to an interquartile range of 50 to 100 hours), we expect that a sample size of ***n=35*** provides 80% power to detect a mean group difference of 25 hours with a two-sided alpha of 5%.

Total enrollment: ***70 subjects*** plus 30 for misplaced catheters or subjects otherwise unable to be randomized; and subjects who withdraw for both infraclavicular and popliteal-sciatic groups. This allows for a possible total of 200 subjects total.

10. HUMAN SUBJECTS

Inclusion criteria: (1) patients undergoing ulnar and/or radial fracture open reduction internal fixation or painful foot and/or ankle surgery with a planned infraclavicular or popliteal sciatic perineural catheter, respectively, for postoperative analgesia; and (2) age 18 years or older.

Exclusion criteria: (1) Daily opioid use within the previous 4 weeks; (2) clinical neuro-muscular deficit of either the brachial plexus (infraclavicular) or sciatic nerve (sciatic catheters) and its branches and/or innervating muscles; (3) morbid obesity [body mass index > 35 kg/m^2]; surgery outside of the ipsilateral sciatic and saphenous nerve distributions for sciatic catheters [e.g., iliac crest bone graft]; (5) pregnancy [as determined by

a urine pregnancy test prior to any study interventions]; and (6) incarceration.

11. RECRUITMENT AND PROCEDURES PREPARATORY TO RESEARCH

Patients will be identified by the investigators as part of their routine preoperative care: we—as anesthesiologists—meet with patients the morning (or early afternoon) of the surgery to review the history, perform a physical exam, and discuss the anesthetic/analgesic plan with the patients. Therefore, possible candidates will be identified by the investigators as part of their routine medical care. Patients will be "approached" regarding the study as part of this routine preoperative meeting. Non-investigators (anesthesiologists, surgeons, and others) will not be involved in recruiting, and no recruiting materials will be displayed/dispersed (e.g, email blast, posters), other than the IRB-approved informed consent form. The investigators are all regional anesthesiologists (save the program manager Baharin Abdullah) who will identify potential participants when they come in for their scheduled surgery. One important inclusion criterion is that patients are having a perineural catheter and postoperative local anesthetic administration; and, this won't be known until the investigators meet with the patients to review their history (standard of care) and subsequently discuss the possibility of the perineural catheter and infusion for patients who qualify for this treatment.

12. INFORMED CONSENT

The investigators are NOT going to review medical records for study purposes prior to signed consent—the investigators are regional anesthesiologists who will be providing normal, routine care and will review the records for purposes of standard patient care will ask patients if they are interested in study participation.
If the patient is interested, then either the anesthesiologist will provide informed consent (written consent with an IRB-approved ICF if patient desires enrollment) or will gain permission from patients for a research coordinator (i.e., Program Manager Baharin Abdullah) to provide informed consent. In this way, HIPAA regulations will be adhered to. Importantly, subjects will have enough time to consider whether or not they want to participate even though consenting is done right before the procedure: patients usually have an extra hour prior to surgery since they are brought in early enough that even if the surgeon is working far ahead of schedule, the case will not be delayed. The result is a good deal of time for nearly all patients waiting prior to surgery. If any patient does not have adequate time, they will not be enrolled in the study. If a patient desires study participation, written, informed consent will be obtained. An investigator or research coordinator specifically trained in both study details and appropriate consenting procedures will attain verbal and written informed subject consent. The method of documenting consent will be using written informed consent form (including a written HIPAA consent form and UCSD Experimental Subjects' Bill of Rights).

13. ALTERNATIVES TO STUDY PARTICIPATION

The alternative is not to participate. No patients will be coerced to participate in any way. Patients who decline enrollment will receive normal standard of care treatment.

14. POTENTIAL RISKS

Associated with standard-of-care:
1. Pain or discomfort during catheter insertion
2. Bleeding during catheter insertion
3. Local anesthetic toxicity from the initial nerve block or postoperative administration
4. Infection at the catheter insertion site
5. Nerve injury from either the initial nerve block or subsequent local anesthetic administration

Associated specifically with study participation:
6. Disappointment one was not randomized to a desired treatment group
7. One treatment group might do better than the other

8. Loss of confidentiality

15. RISK MANAGEMENT PROCEDURES AND ADEQUACY OF RESOURCES

1. Pain or discomfort during catheter insertion. Participants will be given intravenous midazolam and fentanyl, titrated to effect to minimize discomfort yet keep the participant responsive to verbal cues throughout the procedure.
2. Bleeding during catheter insertion. Ultrasound guidance is used to identify and avoid any blood vessels.
3. Local anesthetic toxicity from the initial nerve block or postoperative administration. Ultrasound guidance will be used to identify the target nerve and observe local anesthetic bolus administration; aspiration is always performed every 2-5 mL of local anesthetic injected as a bolus by anesthesiologists (to check for heme which would indicated a possible intravascular catheter). Epinephrine is included in all local anesthetic used for single-injection peripheral nerve blocks which acts as an early indicated of an intravascular injection with hypertension, tachycardia, or bradycardia (due to hypertension). Lipid emulsion is the standard treatment for local anesthetic toxicity and is kept on every regional anesthesia cart. For the postoperative local anesthetic administration, the total volume of ropivacaine 0.2% will be less than 20 mL/hour.
4. Infection at the catheter insertion site. Sterile technique will be used during catheter insertion, including the use of chlorhexidine skin preparation, a sterile drape, a sterile sleeve on the ultrasound transducer, and sterile gloves used by the anesthesiologists (along with a surgical mask and hat). Signs and symptoms of infection will be inquired upon by the investigator daily.
5. Nerve injury from either the initial nerve block or subsequent local anesthetic administration. An ultrasound is used to guide the block needle adjacent to the target nerve while avoiding nerve penetration; and, postoperatively, the total volume of ropivacaine 0.2% will be less than 20 mL/hour. Patients will be instructed on removing the catheter by telephone.
6. Disappointment one was not randomized to a desired treatment group. There is nothing we can do to avoid this risk.
7. One treatment group might do better than the other. Surgical patients are always provided with a prescription for opioids to take as needed.

16. PRIVACY AND CONFIDENTIALITY CONSIDERATIONS INCLUDING DATA ACCESS AND MANAGEMENT

The following study procedures will be done to maintain confidentiality of this study. Potential patients will be identified during the preoperative interview by investigators. Enrollment forms (the first page of the uploaded case report forms) will include the patients' names and randomization numbers; and, data collected subsequently (second page of the uploaded case report forms) will include only the randomization number and subject initials. Hard copies of consent forms will be kept in a locked UCSD medical office on UCSD property and the patients' own medical charts. The data collection forms will also be kept in a locked medical office. Any digitized records will be stored in encrypted files on password-protected UCSD-networked and owned computers. Drs. Finneran, Ilfeld, and Abdullah will have access to the code key, and Dr. Ilfeld will determine who gets access to it as well as the coded study data.

17. POTENTIAL BENEFITS

There is the potential for participants who are randomized to the programmed intermittent bolus group to receive improved analgesia and/or analgesia for a longer duration. However, future patients may benefit if we determine that one method of local anesthetic infusion provides superior analgesia compared with the other. In addition, current subjects may benefit if they require future surgery with a continuous popliteal sciatic nerve block.

18. RISK/BENEFIT RATIO

The medical risks to participants and the risk of confidentiality loss have been minimized. The benefits to

society and future patients are potentially significant since there currently may be thousands of patients receiving less-than-optimal analgesia after painful orthopedic surgery and therefor requiring more opioid analgesics.

19. EXPENSE TO PARTICIPANT

All study procedures that are the same as standard care will be billed to the subject or their insurance. The study will be covering the costs of creating the case report forms and the telephone calls. The infusion pumps are being donated by the manufacturer and the participants are not responsible for potential damage or loss of the disposable infusion pumps.

20. COMPENSATION FOR PARTICIPATION

None.

21. PRIVILEGES/CERTIFICATIONS/LICENSES AND RESEARCH TEAM RESPONSIBILITIES

The Principal Investigator, Brian M. Ilfeld, MD, MS, is a board-certified anesthesiologist with fellowship training in and 20 post-training years of experience with regional anesthesia and perineural local anesthetic infusion. Dr. Ilfeld holds a license to practice medicine in California. Dr. Ilfeld also has medical privileges at the UC Medical Centers.

Drs. Finneran, Gabriel, Said, Curran, Chandrabose and Swisher are board-certified anesthesiologists with fellowship training in and multiple post-training years of experience with regional anesthesia and perineural local anesthetic infusion. All of these individuals hold active licenses to practice medicine in California and medical privileges to practice at UCSD Medical Centers. Baharin Abdullah, MD, is the Program Manager for this project and extensive training and experience as a research coordinator and regulatory specialist at the UC San Diego CTRI. She should be given access to the documents on the IRB website so that he can help manage the IRB submission and regulatory documents.

One of the investigators or another UCSD regional anesthesia faculty member with similar training/experience in perineural techniques, will either place or supervise a resident/fellow placing all perineural catheters.

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23. FUNDING SUPPORT FOR THIS STUDY

This is an unfunded clinical trial. The manufacturer of the infusion pumps, Infutronix, is donating the

disposable infusion pumps.

24. BIOLOGICAL MATERIALS TRANSFER AGREEMENT

Not applicable.

25. INVESTIGATIONAL DRUG FACT SHEET AND IND/IDE HOLDER

Not applicable.

26. IMPACT ON STAFF

There will be minimal impact on staff as the patients will be receiving standard of care procedures. Drs. Ilfeld and Finneran are provided time by the UCSD Department of Anesthesiology for clinical investigations.

27. CONFLICT OF INTEREST

Over the last three years, ***Drs. Finneran, Swisher, Gabriel, Said, Chandrabose, Curran and Ilfeld:*** The University of California has received funding and product for other research projects from cryoneurolysis device manufacturer Epimed International (Farmers Branch, TX); infusion pump manufacturer Infutronics (Natick, MA); and a manufacturer of a peripheral nerve stimulation device, SPR Therapeutics (Cleveland, OH).

28. SUPPLEMENTAL INSTRUCTIONS FOR CANCER-RELATED STUDIES

Not applicable.

29. OTHER APPROVALS/REGULATED MATERIALS

Not applicable.

30. PROCEDURES FOR SURROGATE CONSENT AND/OR DECISIONAL CAPACITY ASSESSMENT

Not applicable.