

# *Clinical Protocols for Regional Anesthesia at the Nashville Surgery Center:*

2011

In an effort to somewhat standardize our regional anesthesia efforts at NSC in order to offer a relatively consistent anesthesia practice, clinical protocols for various procedures at the NSC have been developed. These clinical protocols are *guidelines*, and providers should not feel constrained by them for particular patients. These protocols are derived from existing literature as well as our experience and observations at the Nashville Surgery Center. The surgical procedures are not all-inclusive, but representative, common procedures performed at the VOS. Prior to any surgical or anesthetic procedure, a “Final Time Out” will be conducted to verify unilaterality for each patient scheduled for a specific operation; physician initials on the surgical extremity should be visible during block placement.

**Local Anesthetics:**

1.5% Mepivacaine or 0.5% Ropivacaine <sup>(1)</sup>

**Adjuncts:**

Avoid epinephrine when possible. Consider decadron 2-4mg and/or clonidine 50-100ug for an average of 3-6 hour increased duration <sup>(2)</sup>.

Abbreviations for Table:

- AXB = Axillary Block
- ICB= Infraclavicular Block
- SCB = Supraclavicular Block
- ISB = Interscalene Block
- CPB = Cervical Plexus Block
- CPNB = Continuous Peripheral Nerve Block Catheter
- PISB = Posterior Interscalene Block (with or without USG)
- ICBG = Iliac Crest Bone Graft
- Wrist Block

<b>Upper Extremity Blocks <sup>(3)</sup></b>							
<b>Surgical Procedure</b>	<b>Local</b>	<b>Bier <sup>(a)</sup></b>	<b>Single Shot Block</b>			<b>CPNB</b>	
			<b>AXB/ICB</b>	<b>SCB</b>	<b>ISB</b>	<b>ICB/SCB</b>	<b>PISB</b>
Trig Finger	X						
CTR(Lee)	X						
Ganglion Cyst(Lee)	X						
CTR(others)		X					
Gang Cyst (others)		X					
“Tendon sheath incision”	X alternate	X					

Mucous Cyst-digit		X					
Finger/Hand Amputation			X <sup>(f)</sup>				
Dupuytren's Contracture			X <sup>(f)</sup>				
Fasciectomy Hand			X <sup>(f)</sup>				
Wrist/Hand Arthroplasty			X <sup>(f)</sup>				
Wrist Tendon Repair			X				
Wrist Arthroscopy			X				
Phal/MC/carpal ORIF			X <sup>(f)</sup>				
Wrist Arthrodesis			X <sup>(b)</sup>			consider	
Forearm ORIF			X <sup>(c)</sup>				
Carpectomy			X <sup>(b)</sup>				
Ulnar Nerve Transposition				X <sup>(b)</sup>			
Elbow-Tenotomy/Lig				X <sup>(b)</sup>			
Elbow Arthroscopy				X			
Dist Bicep Tdn Repair				X	and/or X X <sup>(d)</sup>		
Shoulder Arthroscopy					X <sup>(b)</sup>		
Capsule/SLAP repair					X <sup>(b)</sup>		
AC Joint					X <sup>(b)</sup>		
Humeral ORIF							X
Open RCR							X
Total Shoulder Arthroplasty							X
Clavicular ORIF			Consider CPB				
ICBG						TAP or Wound Caths <sup>(e)</sup>	

(a): Bier Block: 0.5% Lidocaine plain x 50ml; consider adding 1meq bicarb/10ml solution as well as Toradol 30mg.

(b): Consider long acting local anesthetic with possible decadron or clonidine. Consider CPNB for moderate invasiveness or opioid tolerance.

(c) Discuss with surgeon concern for compartment syndrome

(d) Consider Suprascapular Block for less invasive shoulder surgery or presence of contraindication to interscalene block such as significant pulmonary disease.

(e) Surgeons may place a Wound Catheter prior to closing the ICBG site. Recent reports show excellent analgesia with single shot or CPNB with T12 TAP block.

(f) Consider short-acting AXB combined w/ long-acting wrist block. *We have experienced excellent patient satisfaction with a shift from long-acting arm blocks to short-acting brachial plexus blocks combined with long-acting wrist blocks for painful procedures involving the hand/wrist.*

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Abbreviations for Lower Extremity Table:

ESWT- extra-corporeal shock wave therapy

POP- popliteal

Saph- saphenous

FNB- femoral nerve block

Obt- Obturator nerve block

LPB- lumbar plexus block

CSE- combined spinal epidural

Epi CP- epidural with chlorprocaine

SAB- subarachnoid block/spinal with either lidocaine or chlorprocaine

POP- CPNB: popliteal continuous peripheral nerve block catheter

GA- general anesthesia

<b>Lower Extremity Blocks <sup>(4)</sup></b>											
<b>Surgical Procedure</b>	<b>Ankle</b>	<b>POP</b>	<b>Saph <sup>(a)</sup></b>	<b>FNB</b>	<b>Obt</b>	<b>LPB</b>	<b>CSE</b>	<b>Epi CP</b>	<b>SAB</b>	<b>Pop CPNB</b>	<b>GA</b>
Plantar Fascia Endo/ ESWT											X
Hammertoe(s)	X										
Toenail(s)	X										
Hallux Rigidis	X	X <sup>(b)</sup>	X <sup>(b)</sup>								
Hallux Valgus										X	
Morton's Neuroma	X										
Toe Amp	X										
ProxTib Bone Harvest				X							
Phal/MT ORIF	X	X <sup>(b)</sup>	X <sup>(b)</sup>								
Tarsal/Malleolar ORIF		X	X							X <sup>(b)</sup>	
Ankle Arthroscopy		X		X <sup>(c)</sup>							
Ankle Reconstr-Ligament			X	X <sup>(b)</sup>						X	
Ankle Arthodesis			X	X <sup>(b)</sup>						X	

Achilles Tendon Rpr		X		X							
Knee Arthroscopy				X <sup>(b)</sup>	X <sup>(b)</sup>	X <sup>(c)</sup>	X <sup>(d)</sup>	X <sup>(d)</sup>	X <sup>(d)</sup>		X <sup>(b)</sup>
ACL Reconst				X <sup>(b)</sup>	X <sup>(b)</sup>	X	X <sup>(d)</sup>	X <sup>(d)</sup>	X <sup>(d)</sup>		X <sup>(e)</sup>

(a) Trans-sartorial saphenous block for ankle surgery; saphenous block at ankle for distal foot surgery

(b) Alternate block

(c) Short acting block

(d) Consider short-acting central neuroaxis blocks for patients who desire to observe arthroscopy or who desire minimal sedation, especially in patients > 40 years of age with minimal PDPH risk.

(e) Most ACL reconstruction is performed under combined GA/Reg; consider sedation w/ regional for central neuroaxis blocks

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**Sedation:**

For block placement, consider versed with either ketamine 10mg or fentanyl. Our experience has been excellent with versed 2mg and ketamine 10mg for most procedures, which minimizes nausea and vomiting, pruritis, and respiratory depression (with benzodiazepine synergy).

For intraoperative sedation, mild to moderate sedation is most commonly performed with propofol infusions in 25-75mcg/kg/min range. Adequate, stable levels of propofol can be readily achieved with a propofol bolus (0.5-1.0mg/kg) followed by a propofol infusion, which appears to provide better control than simply gradually increasing propofol infusion without a bolus. Alternatively, ketamine 10-20mg with clonidine 50-100mcg IV produces a relaxed, quiet patient or additional versed can be given intraop with or without postop flumazenil for improved pacu recover times. Consider adding ketamine (0.25-0.5mg/kg prior to incision followed by 50% dose every hour) for opioid-tolerant patients or for highly invasiveness surgery. To avoid nausea, vomiting, and excess sedation, minimize narcotics throughout. Increase sedation to deep sedation/general anesthesia (“TIVA” or LMA placement) if patient either requests deep sedation during preoperative assessment, requires deep sedation due to movement or pain, or if the surgeon requires general anesthesia.

**Catheters:**

**General Guidelines:**

Anesthesia providers will use surgical cap, mask, sterile gloves, and sterile drapes; use of sterile gowns is optional at the discretion of the staff. Chlorhexidine prep is recommended, with a “1030” clear, fenestrated drape or sterile towels (clear drape allows visualization of extremity, fixation of drape to skin for improved sterility, and less claustrophobia with brachial plexus catheters). Either in-plane (IP) or out-of-plane (OOP) approach may be used, although the mandible may preclude using OOP technique

for ISB-CPNBs. With a sterile syringe, dose a 1-5ml initial bolus through the needle to ensure proper needle tip placement; advance the multi-orifice catheter 3-5cm within the sheath, and confirm proper catheter placement by observing appropriate hydro-dissection, observing appropriate flow on color-doppler, or by actually visualizing the catheter within the sheath. Inject the remainder of the local anesthetic through the catheter, which should confirm a functional catheter and rule out catheter-related problems (kinking, intravenous or other aberrant placement, leaking, etc). After application of dermabond or equivalent skin glue (to minimize leaking) and surrounding mastisol (to minimize dislodgement), carefully secure the catheter with a Lock-It device. NSC has a CPNB kit with all necessary supplies, except for the Contiplex catheter/needle kit which is added separately.

*Interscalene:*

Consider posterior interscalene (Cervical PVBs) approach to anchor catheter most securely and ensure catheter is out of prep area, which has resulted in >95% success rates (vs <85% with traditional anterior-lateral approach). Posterior techniques, with or without ultrasound, use a 4" Contiplex system with the needle tip near the postero-lateral border of the upper trunk (if using USG). Bevel should point towards shoulder. Dressing should be as posterior as possible to keep out of surgical prep area. Finally, avoid using postoperative "cooling devices" on "full cold" or for prolonged periods.

*Supraclavicular/Infraclavicular:*

Using an USG (OOP or IP) technique, advance needle (2in for SCB and 4in for ICB) with bevel towards shoulder. Needle tip should be placed within inferior-posterior quadrant of plexus for SCB approach and near posterior cord for ICB approach. With the use of USG-supraclavicular catheters, the need for deeper infraclavicular catheters may be decreasing.

*Sciatic (Infragluteal):*

Sciatic catheters may be useful when knee region is prepped into field, which precludes popliteal placement. Nerve stimulation only is most common, as the sciatic nerve is poorly visualized with current probes at NSC. (VUH has a C60 curvilinear probe for deeper blocks.) Advance 4in Contiplex average to an average 2in depth with appropriate nerve stimulation endpoint. With the bevel aimed proximally, advance catheter 3-5 cm, and secure. Infragluteal catheters are more comfortable to patients than classic Labat approaches.

*Popliteal:*

Both NSC and VUH have special leg holders to increase patient comfort and to hold the leg stationary. Using a lateral approach between vastus lateralis and biceps femoris muscles, advance a 4in Contiplex needle just distal to the sciatic bifurcation, continuing until the needle tip lies within the neural sheath between the tibial and common peroneal nerves. Anesthesia technician should wipe Leg Holder down between patients.

### ICBG:

Surgeons will usually place a percutaneous “epidural” catheter beneath the periosteum prior to closing the ICBG site. Consider bolusing with Ropivacaine or Bupivacaine 0.25% x 10ml either intraop or in pacu. Surgeons should include the “procedure” in their Op Note. Anesthesia will follow the patients on the Outpatient Pain Service and write an Encounter Note in Star Panel regarding the use of the OnQ pump. Alternatively, consider a TAP (transverse abdominus plane) block above the iliac crest with or without a catheter.

### Multiple Catheters:

If a patient has two catheters placed (eg popliteal/ saphenous or ISB/ICBG), consider the costs of two OnQ pumps as well as the challenge to the patient managing two pumps at home. Consider using one pump for both catheters with a “male-male” connector, although one sacrifices duration and ability to control infusion rates for each catheter.

### Tunneling:

With the Lock-It mechanism, need for tunneling has greatly diminished, improving OR efficiency as well. Likewise, tunneling does not appear to decrease infection risk with current techniques, which is rare with infusions lasting 1-4 days. Tunneling may decrease leakage around catheters and may displace catheters from the surgical fields. There are multiple methods to tunnel catheters, all of which have inherent pros and cons.

### Pumps:

We are using the CB004 I-Flow OnQ pump with 550ml of 0.125% Bupivacaine at 2-14ml/hr (NSC is considering a change however to the less expensive Accufusor pump in early 2011 which has the same features as the OnQ). Most catheters can be initiated at 6ml/hr with instructions to > by 2ml/hr every 2 hours for breakthrough pain as needed. Odd number rates are not possible; only even number rates actually infuse fluid. Pt may < by 2ml/hr for persistent motor block. Severe pain should be treated by having the patient maximize their infusion rate at 14ml/hr, then slowly decreasing as tolerated to the 6-8ml/hr range. Pumps should be filled prior to the patient leaving the OR, as the circulating OR nurse needs the pump and catheter information for VPIMs nursing documentation. When filling the pumps, use strict sterile technique. On a sterile mayo stand cover, place a sterile basin and the sterile pump/syringe. Pour 9 x 30ml (275ml with over fill) vials of 0.25% PF-Bupivacaine into the bowl and inject volume into pump avoiding air entry. Pour sterile saline into the bowl and inject 250ml of volume into the pump, resulting in 0.125% Bupivacaine concentration. Pump primes automatically within a couple minutes. Clamp tubing once primed. Major surgery, such as a TSA or opioid-tolerant patients, may benefit from the CB006 pump which also has a 5ml patient bolus feature.

### **Patient Education:**

The regional anesthesia team will review all aspects of Home Catheter program with patients and family members. Provide them a “Home Catheter” brochure with the “Outpatient Pain Service” cell phone number 497-2870. Review pump function, plan for breakthrough pain (eg. use of short-acting opiates, increasing rate, other), signs of infection, plan for catheter removal, and any other questions with them. All yellow connectors should be secured with an occlusive to prevent disconnections at home.

### **Fall Precautions:**

Multiple factors including lower extremity surgery, bulky dressings, cast or splints, obesity, regional anesthesia, drowsiness, postoperative balance and proprioceptive changes, inexperience with crutches, lack of adequate help at home, all contribute to the possibility of falling postoperatively. All providers should focus on perioperative efforts to minimize risk of falling to include patient education (including patient information handouts from surgery and anesthesia), anesthesia techniques which minimize postoperative drowsiness and imbalance, crutch training, adequate limb protection with immobilizers, casts, and/or splints, and finally instructions which stress the importance of adequate assistance at home.

### **100% Follow-up of Regional Patients:**

In an effort to provide increased perioperative care to our regional patients, all of our patients will receive a follow up phone call on POD1 or POD2. The purpose of this telephonic contact is to offer advice to the patient regarding postoperative pain management; to assist with an aggressive performance improvement process assessing for postoperative complications, side effects, and satisfaction; to generate procedure logs for trainees; and finally to provide accurate data for use in retrospective chart reviews. The primary responsibility for this follow-up rests on the Regional Anesthesia Resident(s) and/or fellow, with oversight from the daily staff anesthesiologists at NSC. Documentation of the follow-up will be in the Redcap Database, in addition to Star Panel for all catheter patients. All catheter patients will be reviewed with the staff anesthesiologist daily. Concerns which are identified on follow-up will be forwarded to the staff anesthesiologist who supervised the procedure. Once the resident or fellow complete the 3 sections in Redcap database (demographics, baseline, and followup), Dr Malchow will verify each entry for completeness and accuracy. Ongoing analysis of N/V scores, success rates, satisfaction scores, side effects, and complications will be reviewed at regular Sports Medicine POD meetings and shared with the Dept of Orthopedics.

### **Evaluation of Postoperative Neuropraxia:**

If we discover a patient who may have residual sensory or motor deficits during the anesthesiologist’s follow-up or from the surgeon’s follow-up, the supervising anesthesiologist will invite the patient into NSC for reevaluation and develop a differential diagnosis. The anesthesiologist will work together with the surgeon to help manage the patient’s symptomatology, especially if neuropathic pain exists. Consider

referrals to either Neurology for EMG/NCV studies within 3 weeks for moderate to severe injuries (consider earlier studies for baseline data or comparison to contralateral side); Pain Clinic for severe, persistent pain; Radiology for MRI studies; or Physical or Occupational Therapy for need for increased function, ROM, or desensitization. The staff anesthesiologist should include the involved resident and/or fellow whenever possible in order to maximize their education and training. The anesthesiologist will continue to follow the patient on a regular basis until their involvement is no longer necessary and communicate regularly with the rest of the care team. If severe impairment persists beyond 6 months, consider referral to neurosurgery or orthopedic specialists.

I welcome your input as we continue to provide the highest standard of care, continuously striving for high patient satisfaction and safety, maximal OR efficiency, in an environment of education and research.

Randall J. Malchow, MD  
Director, Orthopedic Anesthesia, NSC

### ***Explanatory Footnotes on Above Protocol:***

#### ***(1) Local Anesthetics:***

For consistency, we are using primarily 1.5% mepivacaine or 0.5% ropivacaine for our blocks, with 20-40ml depending on the type of block; mepivacaine results in 4-8hrs and ropivacaine results in 12-24 hrs block duration. Consider 3% chloroprocaine if an ultra short block is desired (ie 90min) or 2% lidocaine for 3-4 hour duration. Mixing a short acting and long acting local anesthetic together appears to significantly decrease the duration of the block.

#### ***(2) Adjuncts:***

(a) Epinephrine. The trend among US Regional anesthesiologists is to decrease or eliminate epinephrine due to the continued concern over decreased neural blood flow and the decreased need for a vascular marker with the wide-spread use of ultrasound guided blocks. Consider using it only for blocks performed without ultrasound guidance.

(b) Decadron. Low dose decadron 4mg may be used in major surgery as an alternative to a CPNB. Avoid the 8mg dose as we have had very prolonged blocks, up to 40+ hours, with the larger dose. If decadron is used, place a "Decadron" sticker over the drip chamber on the IV set to alert providers to avoid additional decadron IV. More recently, doses as low as 2mg appears to offer a similar increase in duration.

(c) Clonidine. Clonidine may also be considered as a useful adjunct. With no other additives, we can expect an average of 3 extra hours with the use of clonidine, perhaps a little longer with lidocaine and mepivacaine. Duraclon comes in a 10ml, "single dose preservative free" vial which is \$33/vial. The dose is 1ug/kg to max of 100mcg if you choose to incorporate this adjunct, resulting in an additional cost per

patient of only \$3. Concentration is 100mcg/ml, so again, max dose would be 1.0ml; draw up all 10mls in a 10ml syringe to easily add 1ml to the block syringe as needed. Technically, once a vial is open, it is good for 24 hrs, so date and time the vial if you are the first to open it. Also, consider wiping off an already "open" vial with alcohol prior to using it. Consider a second provider to verify the adjunct added to a syringe.

(d) Bicarbonate. Bicarbonate may quicken onset time, decrease burning, and possibly improve "the quality of the block". However, it easily precipitates with the longer acting agents, ropivacaine and bupivacaine, the very agents which could use quicker onset times. Therefore, it is rarely used except for Bier Blocks. If one chooses to use it, the dose is 1meq/10ml (and 0.1ml/10ml for ropivacaine and bupivacaine).

### **(3) Upper Extremity Blocks:**

#### **A. Shoulder Surgery: (minimal to moderate invasiveness)**

- Procedures:
  - o Arthroscopy
  - o Rotator cuff repair
  - o AC joint repair
  - o Capsule, Bankart, SLAP repair
- Technique: Most patients receive combined Interscalene (ISB) with light General Anesthesia (GA) with a LMA (ETT if at significant aspiration risk). Consider ISB with sedation only for patients who are at greater risk with GA or for patients who truly desire to avoid GA (< 5% of patients). Consider T1-2 Paravertebrals (PVB) for sedated shoulder patients, in combination with ISB. 30ml of 0.5% Ropivacaine with decadron 4mg will provide 12-24 hours of very good pain relief. Consider substituting suprascapular blocks for minimally invasive surgery or for patients with significant pulmonary disease; discuss with surgeon as to the expected "invasiveness" of the procedure if considering suprascapular block only. Finally, avoid hypotension and bradycardia in patients with interscalene blocks, especially with beach chair position using IV fluids, ephedrine, and/or atropine as the Bezold Jarisch reflex is common in this setting.
- Note: Clavicular ORIF's should be offered either deep or superficial cervical plexus blocks instead of interscalene blocks and/or catheters.

#### **B. Shoulder Surgery: (high invasiveness)**

- Procedures:
  - o Total shoulder arthroplasty
  - o Proximal humeral ORIF
  - o Open Shoulder Cases (eg RCR)
- Technique: Most patients receive a combined Continuous ISB Catheter with light GA with a LMA or ETT. In addition to hydrocodone prn, consider adding nsaid, and/or oxycontin (10-20mg bid), and/or gabapentin (300mg tid) for up to one week for opioid tolerant patients in consultation with the surgeon.

#### **C. Elbow Surgery: (minimal to moderate invasiveness)**

- Procedures:

- Ulnar nerve transposition
- Arthroscopy
- Tendon/ligament repair.
- Technique: Most patients receive an ultrasound-guided, supraclavicular block (USG-SCB) with sedation. Consider 40ml of 0.5% Ropivacaine with decadron 4mg for moderate invasiveness.

*D. Elbow Surgery: (high invasiveness)*

- Procedures:
  - Distal humeral ORIF
  - Above or below elbow amputation
  - Total Elbow Arthroplasty
- Technique: Most patients receive a SCB catheter.

*E. Forearm/Wrist/Hand: (moderate invasiveness)*

- Procedures:
  - ORIF ulna/radius
  - Wrist arthrodesis
  - Wrist arthroscopy
  - Arthroplasty procedures
  - Hand/digit amputation
  - ORIF carpal, mc, phalangeal bones
  - Dupuytren's contracture
  - Phalangeal/metacarpal ORIFs
- Technique: Most patients are receiving either axillary (AXB) or infraclavicular (ICB) blocks based on anesthesiologist's preference. (For ORIF of both forearm bones, check with surgeon regarding concern over compartment syndrome; similarly, consider CPNB with compartment syndrome over a single shot block as a sensory block only may allow detection of compartment syndrome compared to a full motor block.) Add intercostobrachial nerve block (ICBN) for procedures involving upper arm; ICBN block not necessary simply for tourniquet comfort. Consider catheter techniques for higher invasiveness (eg complete wrist arthrodesis) or opioid-tolerance. The recent addition of long-acting wrist blocks, combined with short acting brachial plexus blocks for hand surgery, has improved patient satisfaction and decreased neuropraxia risk.

*F. Hand/Wrist: (minimal invasiveness)*

- Procedures:
  - Carpal tunnel repair (Local for Dr Lee; Bier for others)
  - Ganglion cyst (Local for Dr Lee; Bier for others)
  - Trigger fingers - local
  - DeQuervain's tenosynovitis ("tendon sheath incision")- Bier Block
  - Mucous cyst-digits- Bier Block
- Technique: Most patients receive Bier blocks with 50ml of 0.5% lidocaine with 5 meq of bicarb added. (Dr Lee however uses local/MAC for most of these patients.) 1-3 Trigger fingers and contracture releases are usually performed

under local/MAC anesthesia, as some hand surgeons would like patient to move digits intraoperatively.

**(4) Lower Extremity:**

**A. Knee: (minimal invasiveness)**

- Procedures:
  - o Arthroscopy- meniscus
  - o Arthroscopy- chondroplasty, other
- Technique: Most patients receive lumbar plexus blocks (LPB) using 20ml of 1.5% Mepivacaine with 1:400k epi, combined with sedation intraoperatively. Patients who wish to avoid GA and moderate sedation can be offered “outpatient spinals” (eg lidocaine 40mg or chlorprocaine 40mg), epidurals (2-CP or lidocaine), or combined spinal epidurals. Alternatively, if a patient desires GA, regional anesthesia is probably not necessary with minimally invasive knee surgery. N.B. Patients require a knee immobilizer after femoral and lumbar plexus blocks for knee surgery.

**B. Knee: (moderate invasiveness)**

- Procedures:
  - o ACL repair
  - o Other ligament repair
- Technique: Most patients receive a combined lumbar plexus block or femoral/obturator block with light GA. LPB with 0.5% Ropivacaine w/ 1:400k epi is providing very good analgesia. Patients who wish to avoid GA can be offered either combined LPB with short-acting sciatic block (eg. 2% lidocaine x 20ml) or central neuroaxis blocks involving epidurals (2-CP or lidocaine) or combined spinal epidurals which combine the benefits of both spinals and epidurals. N.B. Patients require a knee immobilizer after femoral and lumbar plexus blocks for knee surgery.

**C. Foot/Ankle: (minimal to moderate invasiveness)**

- Procedures:
  - o Ankle arthroscopy
  - o Achilles tendon repair
  - o ORIF metatarsal, other
  - o Hallux rigidis repair
  - o Hammer toes
  - o Toe amputation
- Technique: Most patients receive a popliteal block combined with a saphenous block (or combined with a short-acting femoral block using 20ml of 2% lidocaine for example if thigh tourniquet used). If femoral block is performed, Dr Thomson does not require a knee immobilizer as his patients do not weight-bear for several days. Dr Deeter and Dr Trenner both prefer ankle blocks since they would like their patients ambulating on the day of surgery.

*D. Foot/Ankle: (high invasiveness)*

- Procedures:
  - o Ankle arthrodesis
  - o ORIF tibia/fibula
  - o Ankle reconstruction
  - o ORIF tarsal bones/calcaneus
  - o Midfoot/BKA amputation
  - o Hallux valgus repair
- Technique: Most patients receive either popliteal or infragluteal sciatic catheters, depending on use of thigh tourniquet and extent of surgical prep, combined with femoral blocks. Dr Thomson's patients do not weight-bear for several days so no need for knee immobilizer with his patients.

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