

Ultrasound Guided FICB: Fascia Iliaca Compartment Block

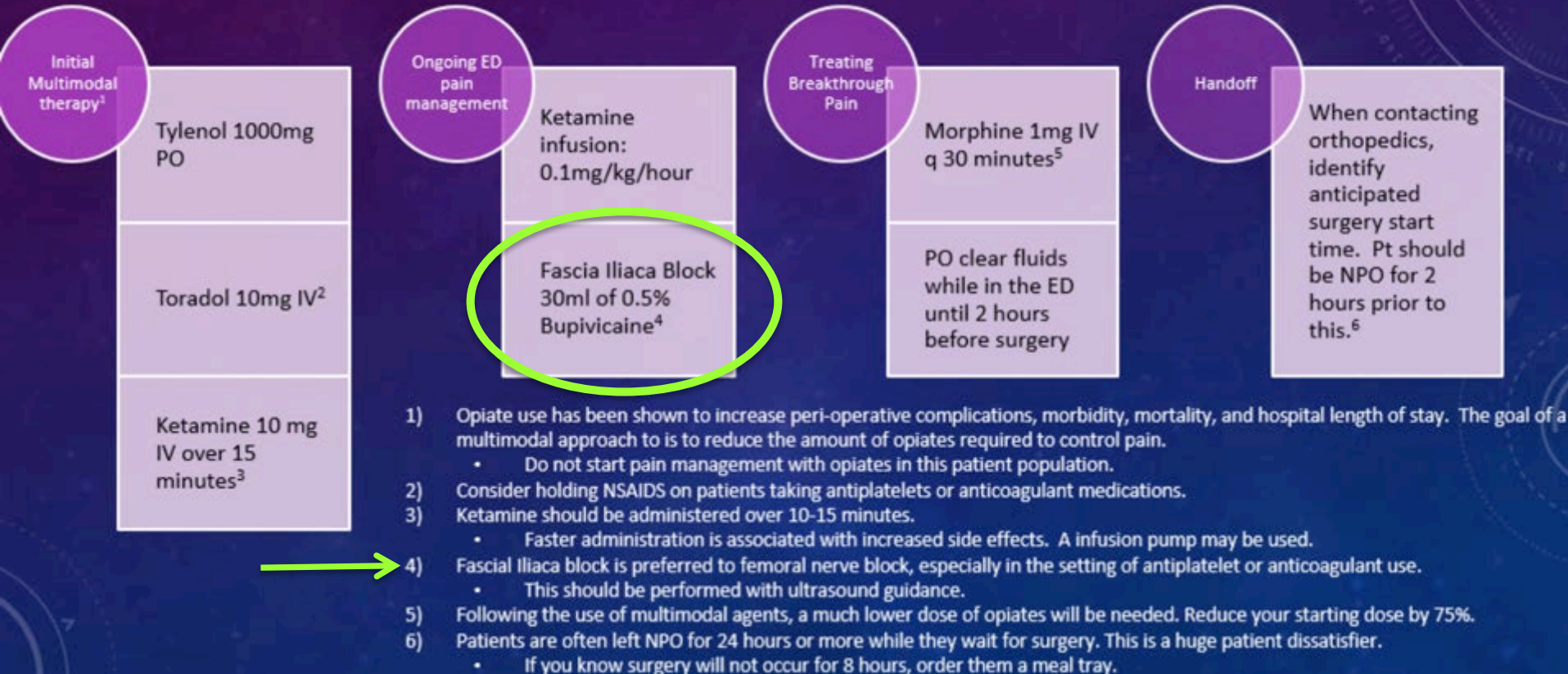
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Outline

- Hip block can limit opiate use
- Femoral nerve block and FICB anatomy and sonographic approaches
- In-plane needle guidance
- Regional anesthesia overview
 - Written Consent required
 - Anesthetic Dosing
 - Monitoring for toxicity

Limiting opiate use

EMERGENCY DEPARTMENT GUIDELINES FOR PAIN MANAGEMENT OF SUSPECTED HIP FRACTURES

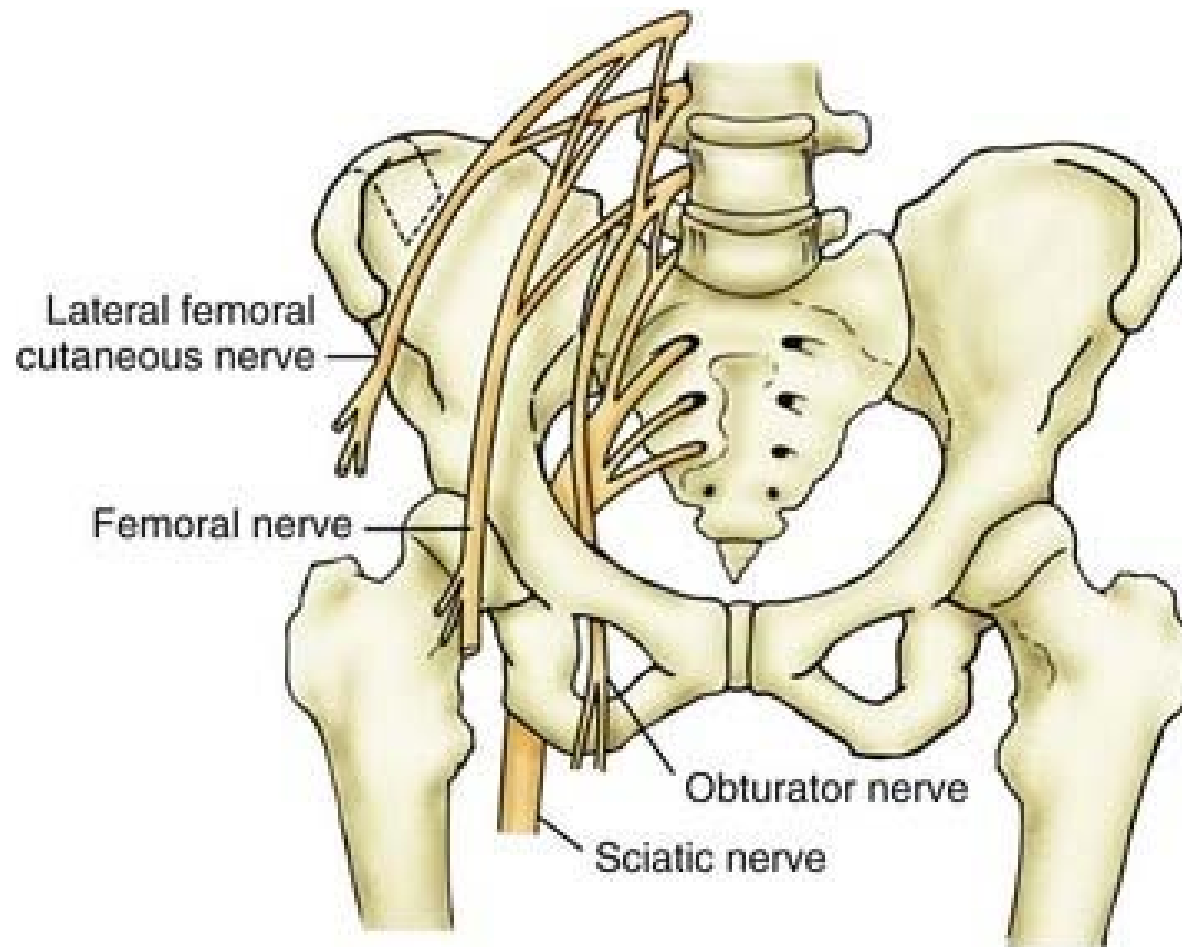




FICB overview

- FICB: Fascia Iliaca Compartmental Block
 - Similar to FNB: US Guided Femoral Nerve Block
 - FICB may be safer without needle injection next to nerve or vascular bundle
 - Analgesia via regional anesthesia block useful in elderly hip fracture patients
 - Incorporated into Multimodal Pain Strategy
 - Can avoid opiate use and its associated adverse effects

Regional Anatomy



Regional Anatomy

ASIS _____

Femoral nerve _____

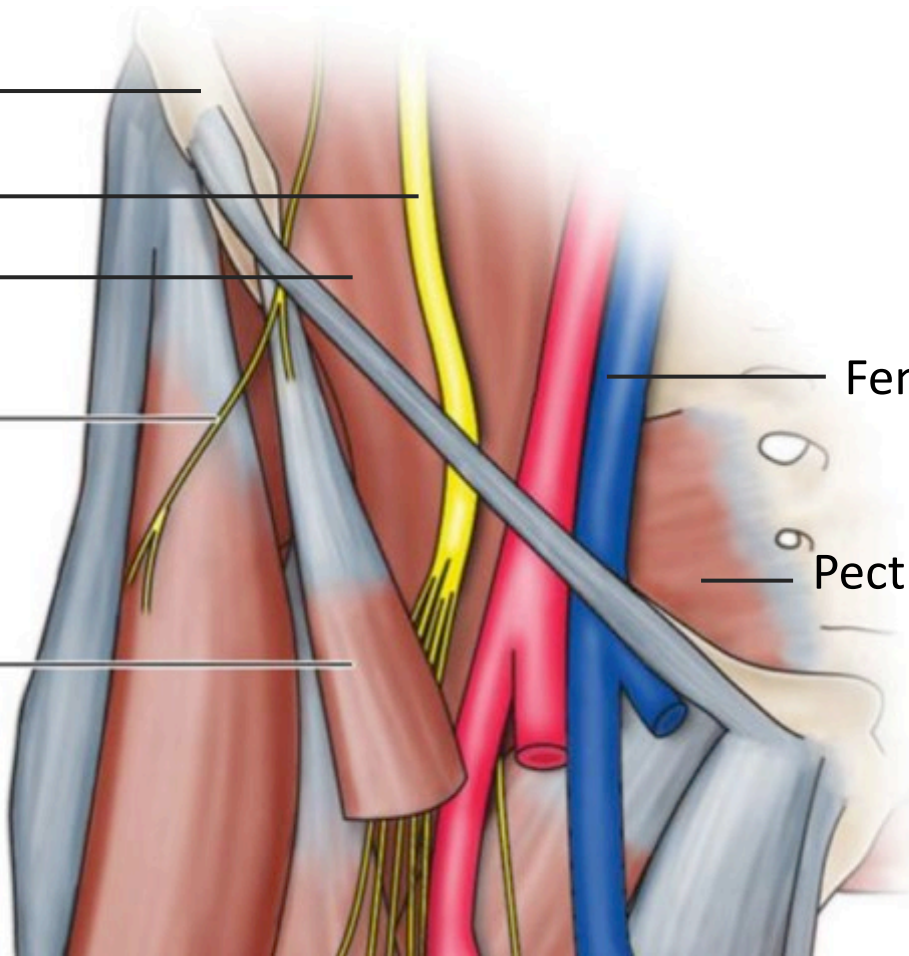
Iliopsoas muscle _____

Lateral femoral
cutaneous nerve _____

Sartorius
muscle (cut) _____

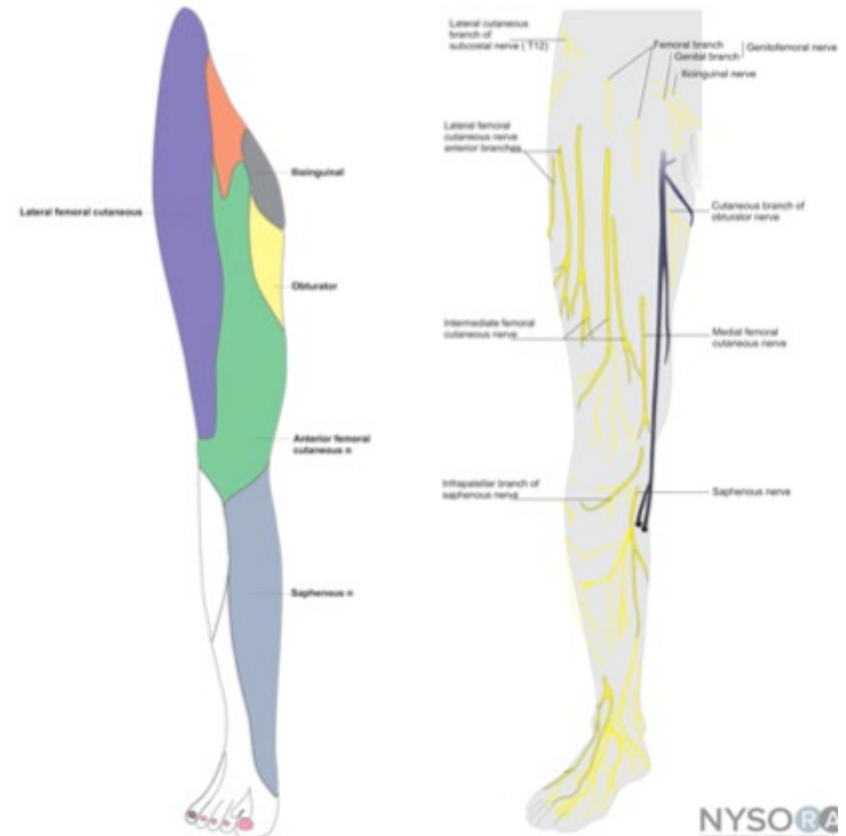
_____ Femoral vessels

_____ Pectinius muscle

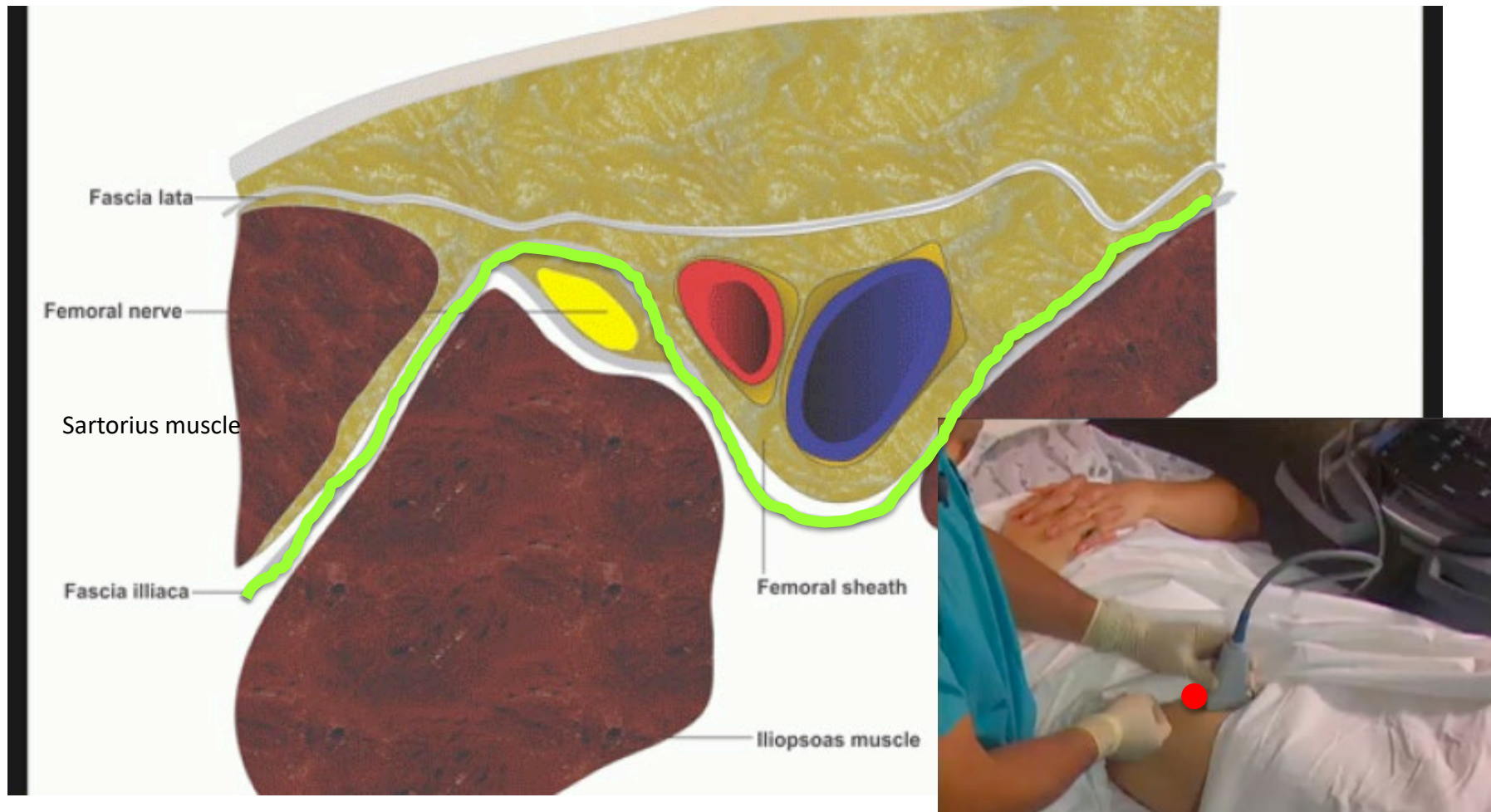


Femoral Nerve

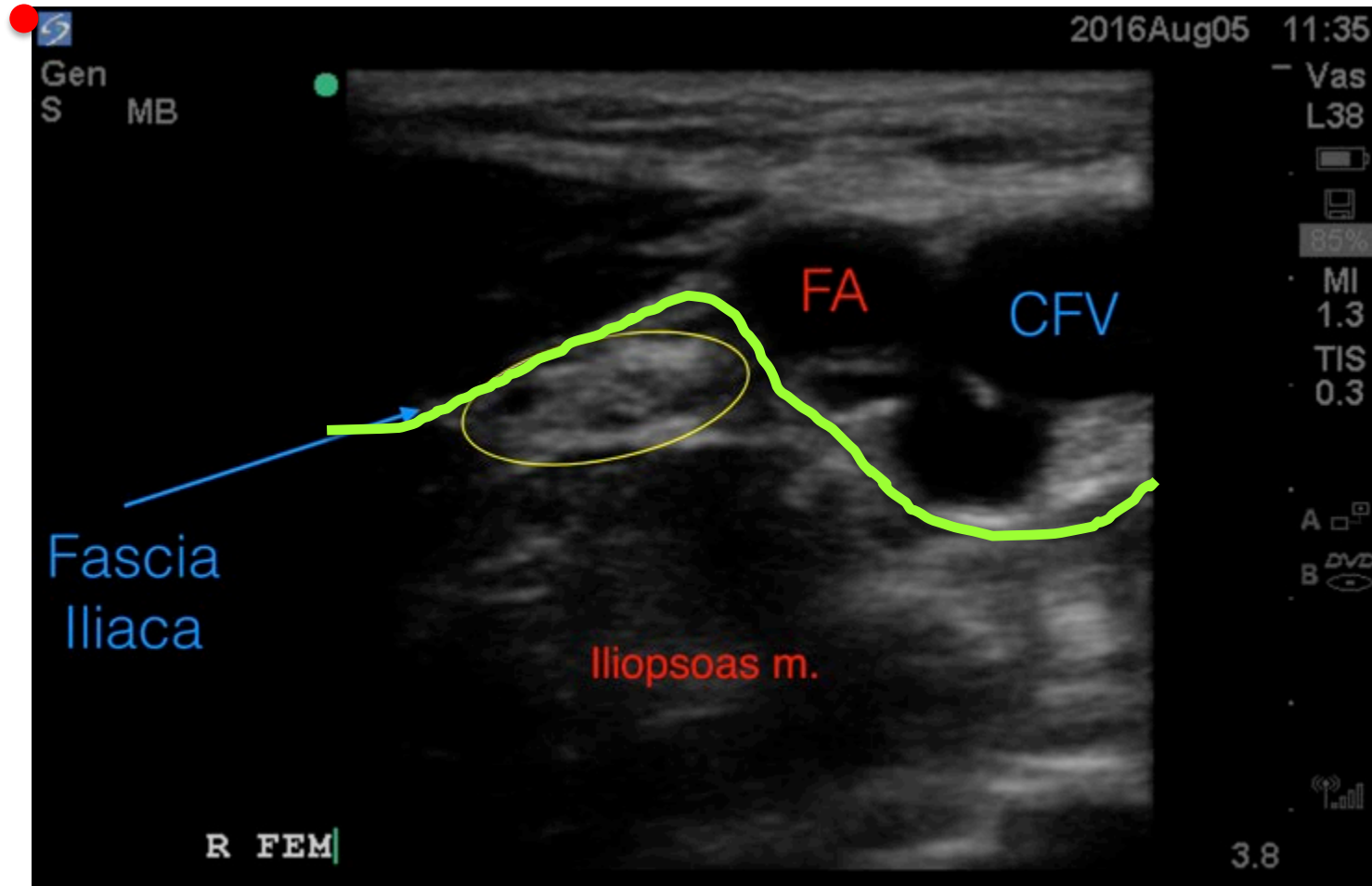
- Innervates cutaneous thigh, knee, medial leg below knee via great saphenous nerve
- Innervation of quadriceps muscles controlling hip flexion and knee extension



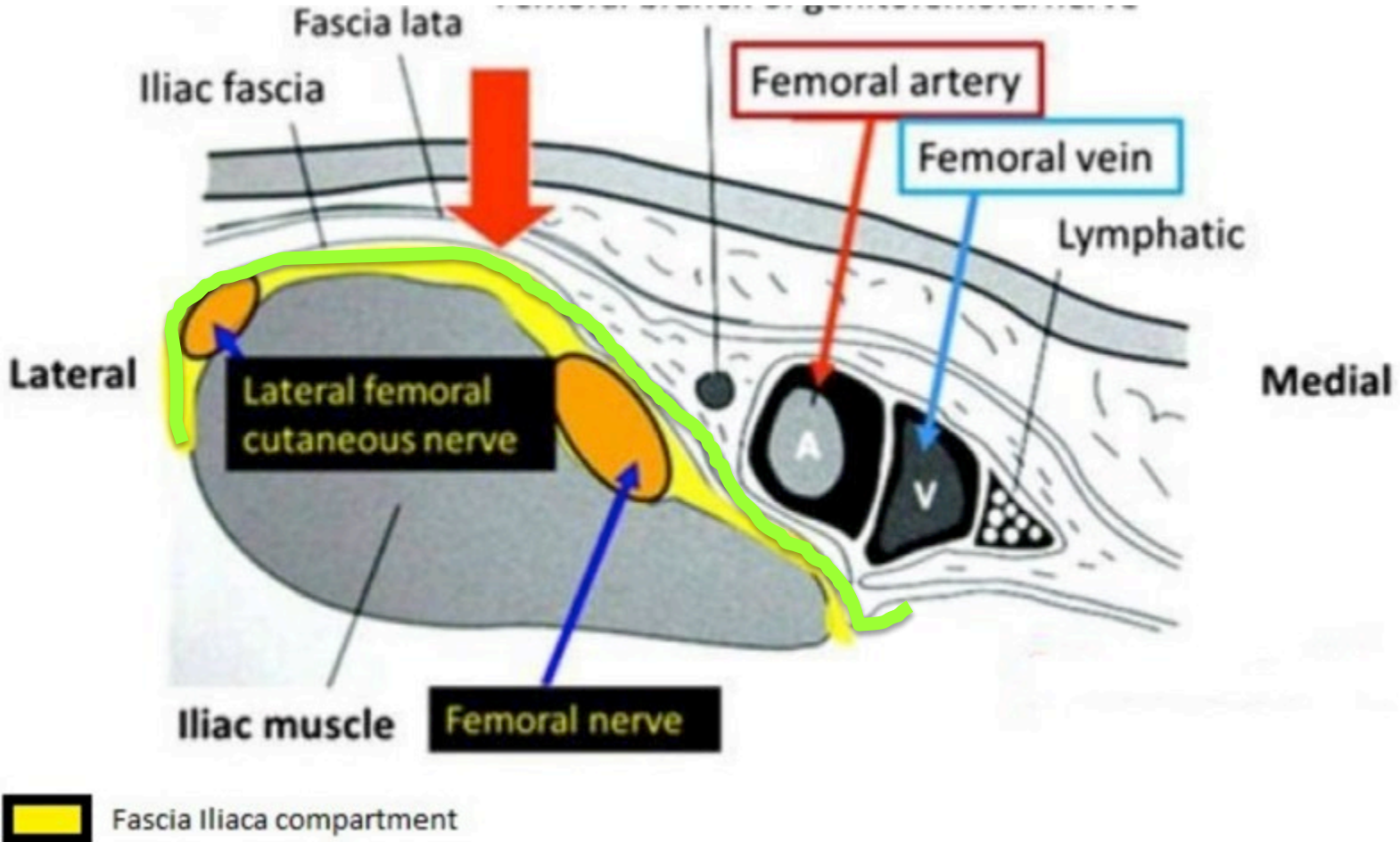
US Guided Femoral Nerve Block



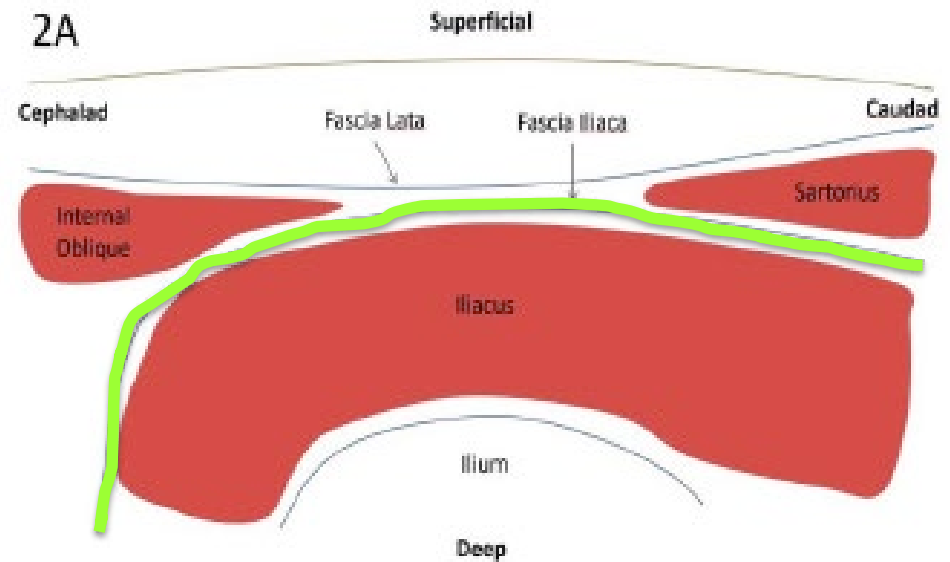
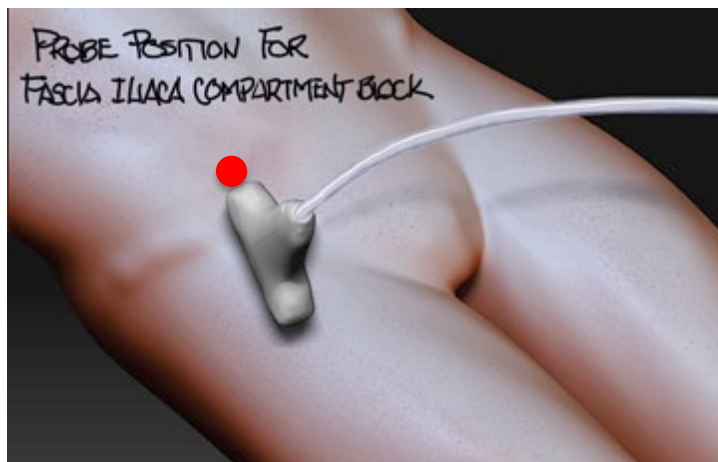
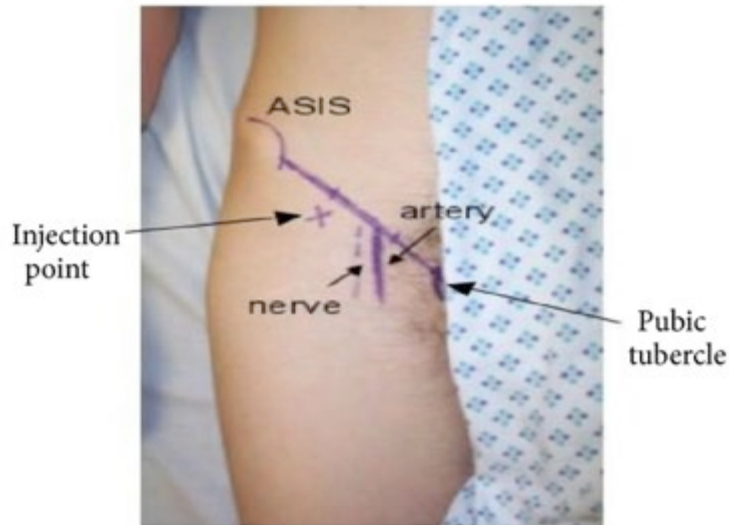
Femoral Nerve Block Sono Anatomy



Fascia Iliaca compartment

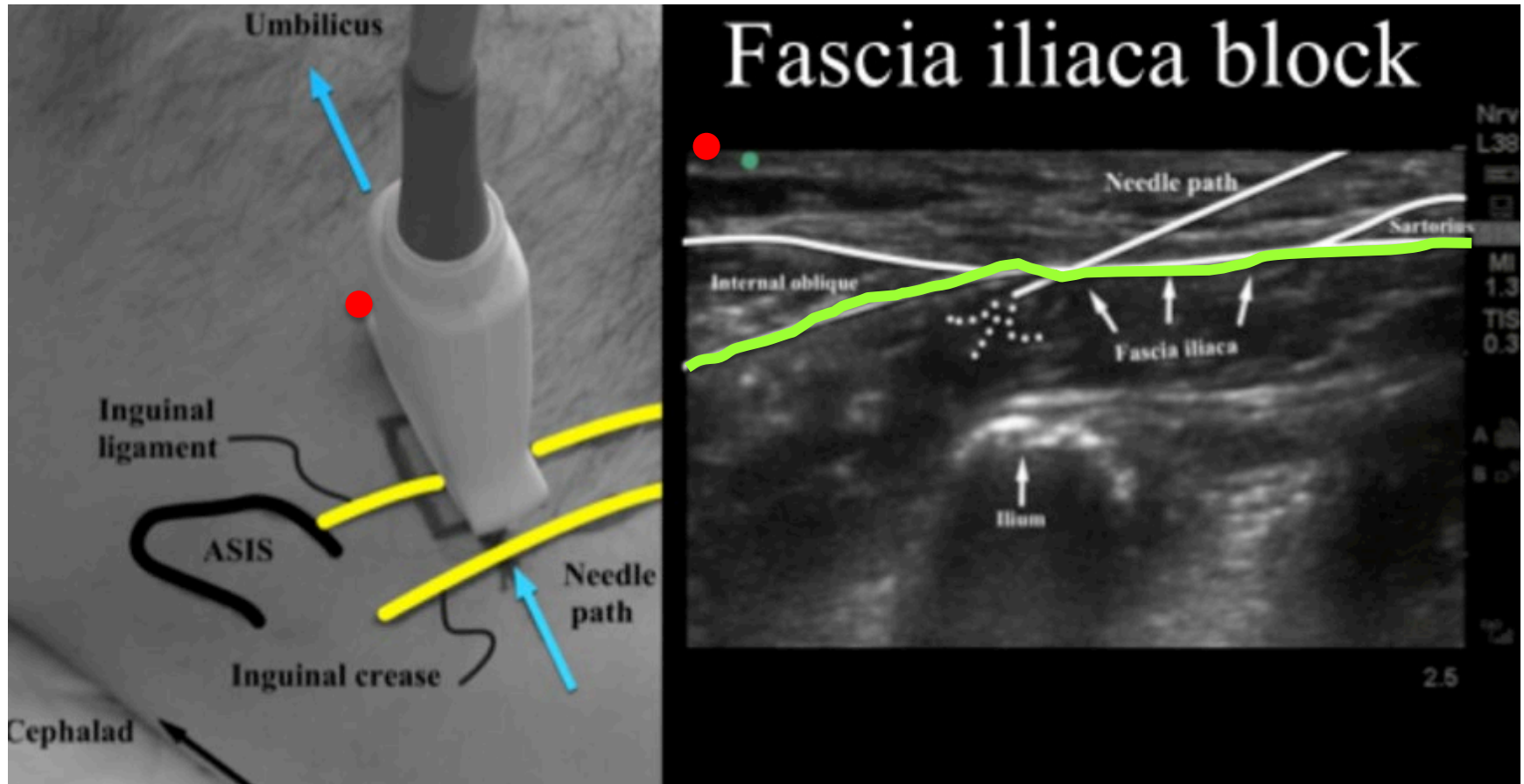


Fascia Iliaca Compartmental Block

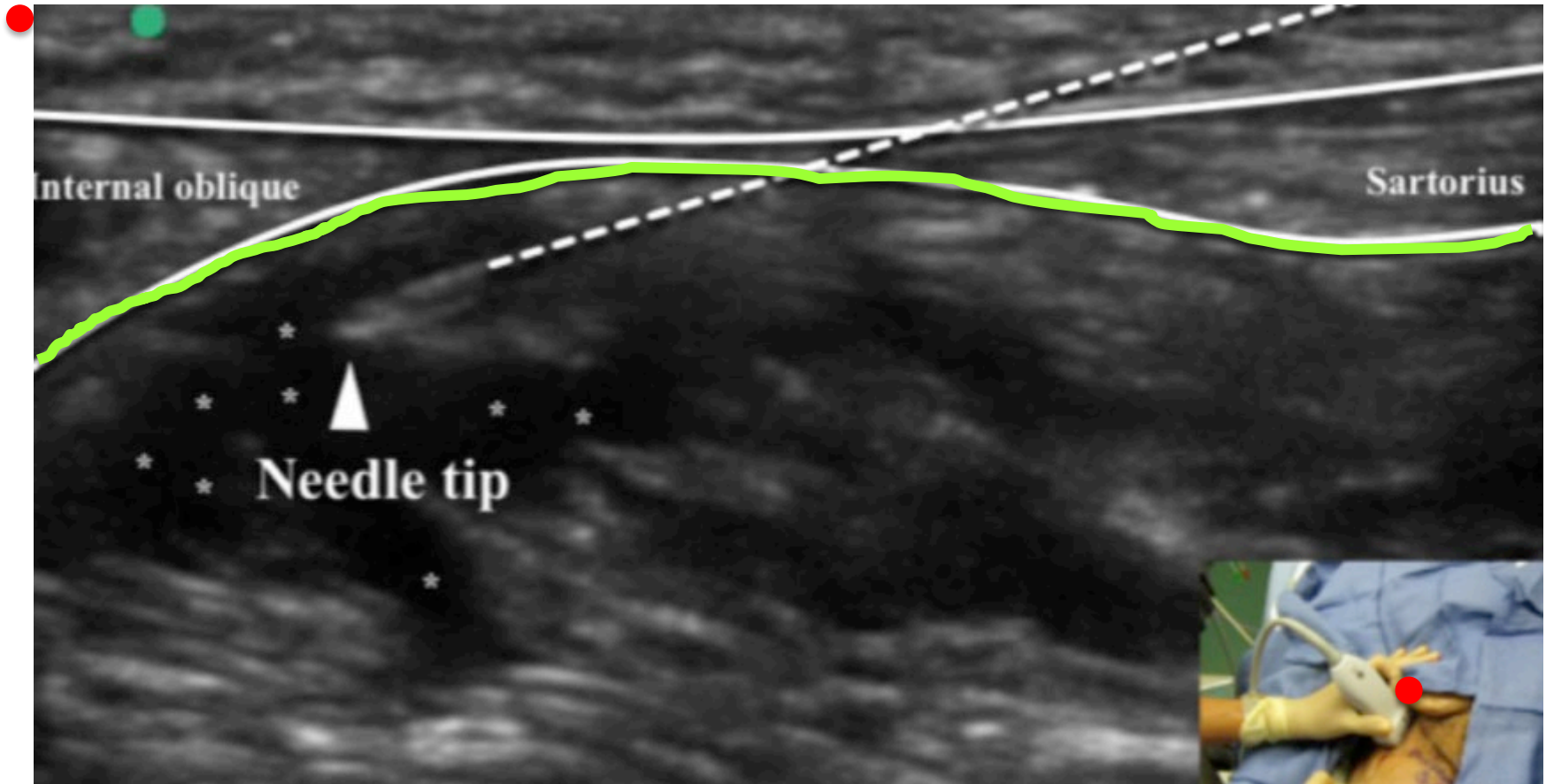


FICB Sagittal (modified) approach

FICB Sonographic Anatomy



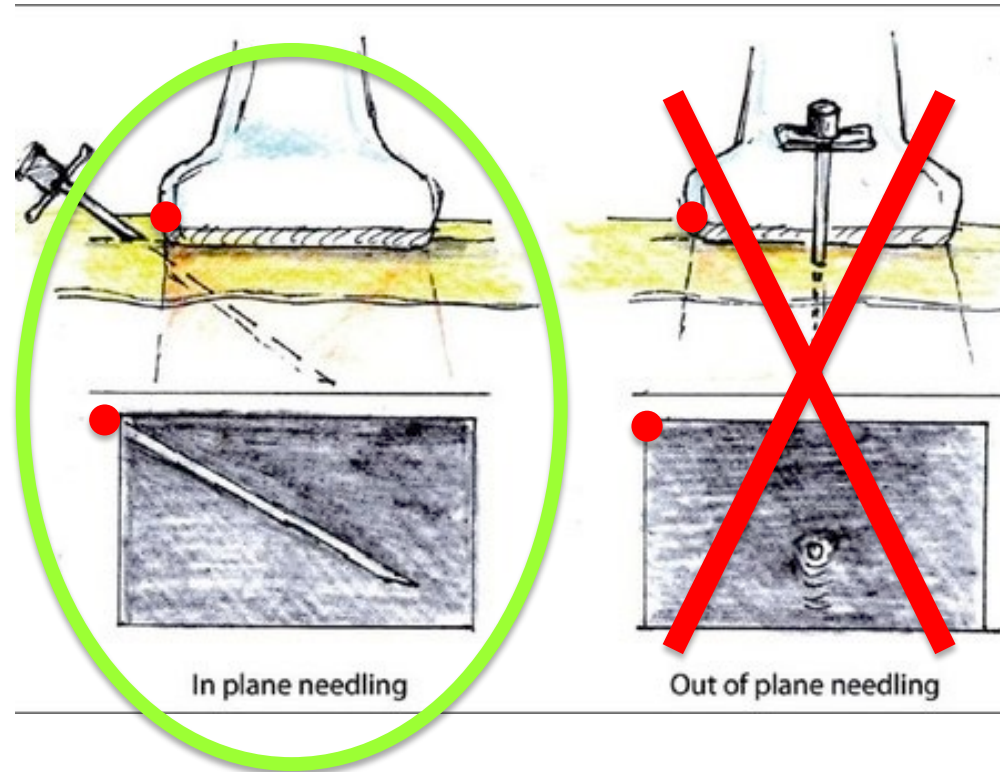
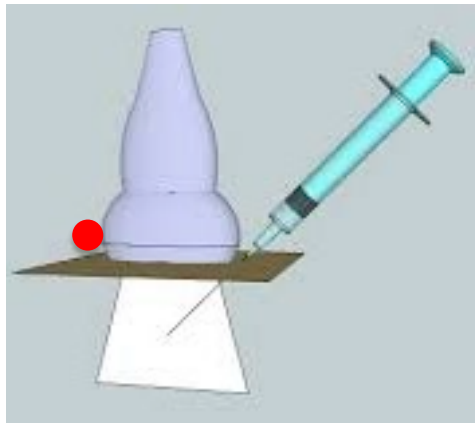
FICB Anesthetic Deposition



[Youtube video link](#)

In-plane sono needle guidance

- Required for all nerve blocks
- Visualize needle shaft and tip



Regional Block Overview

- Indications
 - Pain management, complex laceration repair
- Contraindication
 - Overlying cellulitis, allergy, neurological deficit
 - Coagulopathy (not absolute), pregnancy (FICB)
 - *Risk of impending compartmental syndrome

* Highest risk are tibial fractures, high energy forearm, ankle, and foot fractures

Orthopedics is aware ED performing blocks for hip fractures at BUMC, but still maintain low threshold to discuss blocks with orthopedics prior to initiating

Procedural Preparation

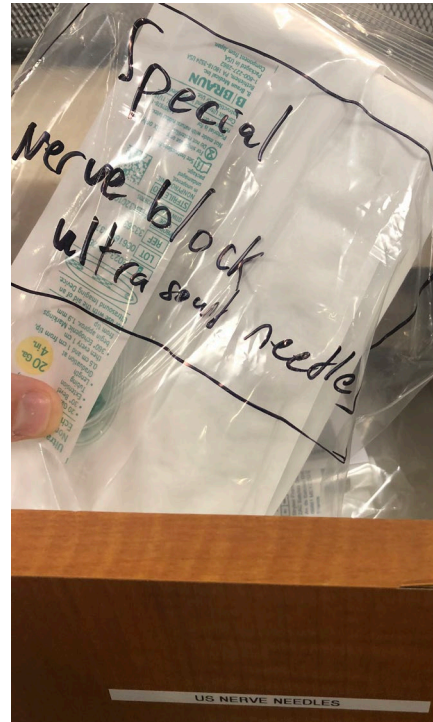
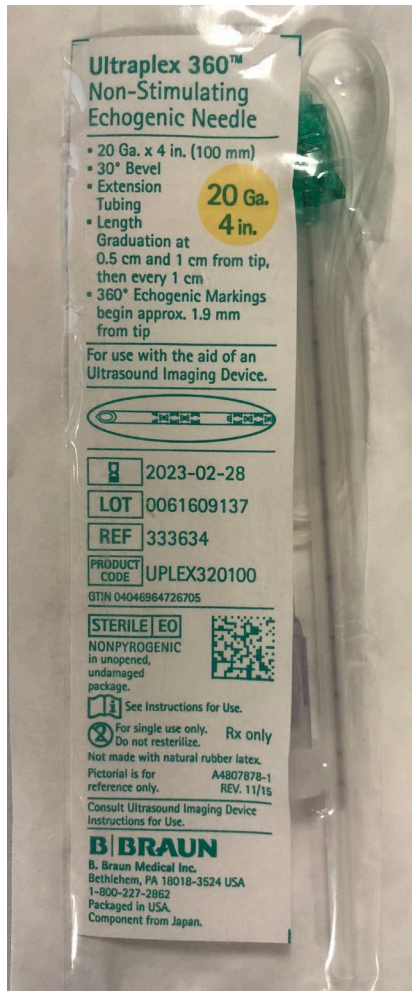
- **Written informed consent (TMB list A)**

_____ REGIONAL BLOCK ANESTHESIA/ANALGESIA - nerve damage; persistent pain; bleeding/hematoma; infection; medical necessity to convert to general anesthesia; brain damage.

- Perform/document neurovascular exam
- Patient positioning, sterile skin prep
 - Supine for FIBC or FNB, lidocaine skin wheel
- Equipment
 - Ultrasound with linear probe, tegaderm, 4” needle

**TMB list A procedure: regional anesthesia, requires listed risks for informed consent

4" Needles with attached tubing



- Two person approach
- Pod A behind flow, in top right draw, labeled “US Nerve Needles”
- Prime tubing 1st



Anesthetic: Bupivacaine

- **Bupivacaine .5% (5mg/mL)**
 - Onset 15-30min
 - Duration 8-12hours
 - **Max dose 2mg/kg**
 - **Max dose = .4 mg/kg**
- Black box warning: dose related toxicity
- Compartment blocks require volume (~40-60mL)
 - example1: 75kg patient, max dose 150mg.
 - Use 30mL bupivacaine (150mg) + 20cc NS = 50mL total
 - example2: 60kg patient, max dose 120mg
 - Use 24mL bupivacaine (120mg), dilute 1:1 NS, inject 48mL total



Bupivacaine Anesthetic Solution

Weight based block solution ratio:

Weight (kg)	Bupivacaine (mL)	NS (mL)
45	18	32
50	20	30
55	22	28
60	24	26
65	26	24
70	28	22
75	30	20
80	32	18
85	34	16
90	36	14
95	38	12
100	40	10

- See Box App to reference chart
- Max dose .5%:
0.4mg/kg
- Solution Volume: 40-60cc

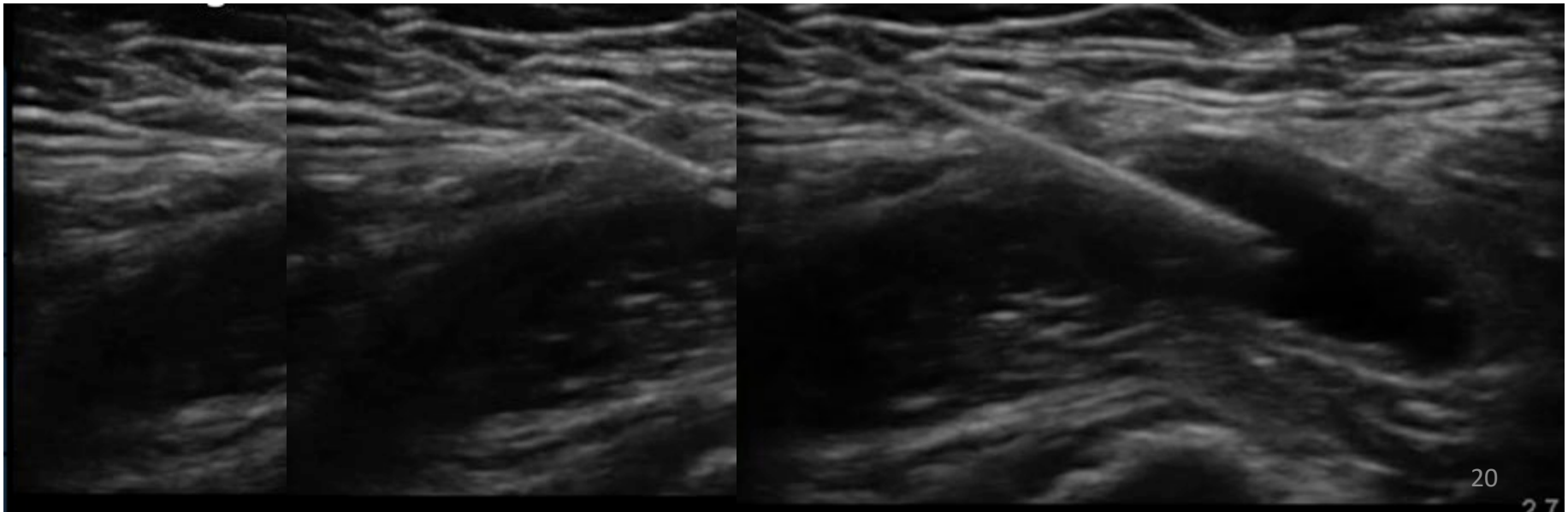
*bupivacaine .5% **max dose .4 mg/kg**

*Block solution 40-60cc, chart based on 50cc



Anesthetic Injection

- Ensure visualization of needle tip in-line approach
- Aspirate before injecting
- Should infuse with gentle pressure





Anesthetic Toxicity: LAST

- Local Anesthetic Systemic Toxicity (LAST)
 - Local anesthetic can be toxic injected intravascularly or systemically absorbed
 - Adverse effects:
 - CNS: AMS, seizures, metallic taste, apnea
 - CV: QRS widening, hemodynamic instability
- Monitoring
 - Monitor patient before, during, and after 30min
- Treatment, mostly supportive
 - Benzodiazapines for seizure, ACLS, consider intralipid

Lipid Emulsion Therapy 20%

- Indications
 - Refractory seizures, severe hemodynamic instability, cardiac arrest
- Dosing
 - 1.5 mL/kg bolus over 1-2minutes
 - Infusion 0.25mL/kg/min (IBW)

Lipid Emulsion 20% (Precise volume and flow rate are not crucial)	
Greater than 70 kg patient	Less than 70 kg patient
Bolus 100 mL Lipid Emulsion 20% rapidly over 2-3 minutes <ul style="list-style-type: none">• Lipid emulsion infusion 200-250 mL over 15-20 minutes	Bolus 1.5 mL/kg Lipid Emulsion 20% rapidly over 2-3 minutes <ul style="list-style-type: none">• Lipid emulsion infusion ~0.25 mL/kg/min (ideal body weight)
If patient remains unstable: <ul style="list-style-type: none">• Re-bolus once or twice at the same dose and double infusion rate; be aware of dosing limit (12mL/kg)• Total volume of lipid emulsion can approach 1 L in a prolonged resuscitation (e.g., > 30 minutes)	

Summary

- Discuss regional nerve block with patient and consultant before procedure
 - Requires written consent
- Document neurovascular exam before block
- Use ultrasound guided in-plane technique
 - Know your anatomy and sonographic approach
- Monitor patient and be aware of how to manage potential anesthetic toxicity