

Let's Block the Pain
What Does That Mean?
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Disclosures
None

Objectives

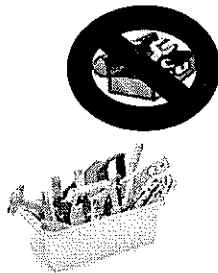
- Definitions
- Medications Involved
 - Local anesthetics
 - Morphine Fentanyl
 - Steroids
- Blocks
 - Nerve
 - Joint

Blocks to be discussed

- Upper extremity
- Lower extremity
- Torso

MultiModal Analgesia

- Opioid sparing
- Assist with compliance with exercise, physical therapy
- Facilitate return of peristalsis



Definitions

- Nerve block
 - Loss of sensation in a region of the body, temporary
- Neurolysis
 - Destroying nerves with alcohol or glycerine
 - Nerves regenerate in different patterns
- Joint Injection
 - Decrease irritation or inflammation

Placement of Medications

- Landmarks
- Fluoroscopy
- Ultrasound

Contraindications

- Coagulopathies: platelet issue, anti-coagulant therapy
- Local infection, cellulitis or psoriatic plaques over area
- Systemic/Septic infections
- Patient refusal
- Allergy

Considerations

- Avoid injections into
 - Tendons, ligaments, nerves
 - Veins or arteries
- Injection of medications should be resistance and pain free
- Injections with corticosteroids in joints every 3 months when appropriate
- Do not continue injections if no improvement

Opioids

Morphine Fentanyl

<p>Morphine - Hydrophilic</p> <ul style="list-style-type: none"> • "Water Loving" • Larger spread in epidural space 	<p>Fentanyl - Lipophilic</p> <ul style="list-style-type: none"> • "Fat Loving" • Couple of dermatomes above and below catheter
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Local Anesthetics

Medication	Onset	Analgesia
Lidocaine	Rapid <1.5 min Epidural 5-15 minutes	Moderate (few hours)
Ropivacaine	Rapid 1-5 min Epidural 15-30 minutes	Moderate-Long
Bupivacaine	Slow 5 min Epidural 10-20 minutes	Long (several hours)

Continuous infusion device
Elastometric Pain Pumps

Olsen, BA 2014 "Clinical Pharmacology Made Ridiculously Simple"

Lidocaine Toxicity

<p>CNS Symptoms</p> <ul style="list-style-type: none"> • Circumoral numbness • Metallic taste • Tinnitus • Vertigo • Convulsions 	<p>CV Symptoms</p> <ul style="list-style-type: none"> • Hypotension • Dysrhythmia • Cardiac arrest
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Treatment

- Stop infusion
- 20% lipid emulsion IV infusion
- ACLS protocol

Steroids

- Dexamethasone (glucocorticoid, corticosteroid)
 - Decrease inflammation
 - Possible protect cartilage
 - Localized pain relief
- Half life >3.5 hrs; in tissues 18-36 hours
- Peak in joint 1 week

Steroid Complications

- Elevated blood sugars
- Flushing
- Mood changes
- Skin depigmentation
- Atrophy of tissue
- Osteoporosis
- Cartilage damage

Steroid flare
– can occur 6-24 hours post injection
– treat with NSAIDs

Upper Extremity Blocks

- Interscalene
- Brachial Plexus
- Shoulder Joint - Subacromial bursa
- Elbow Joint - Lateral epicondylar

Interscalene

- Indicated for:
 - Rotator cuff
 - Shoulder arthroplasty
- Single shot or Continuous Infusion



Brachial Plexus



- Indications for:
 - Arm
 - Elbow, Forearm
 - Hand
- Complication
 - Pneumothorax

Shoulder – Subacromial Bursa

- Indicated for:
 - Osteoarthritis
 - Adhesive capsulitis
 - Shoulder impingement
 - Subacromial bursitis
 - Rotator cuff sprain
 - Rotator cuff tendonitis

Elbow – Lateral Epicondylar

- Indicated for:
 - Overuse conditions
- Complications
 - Extensor tendon rupture

Lower Extremity

- Fascial iliaca
- Femoral
- Adductor canal
- Knee – Suprapatellar
- Heel - Medial tubercle of calcaneous

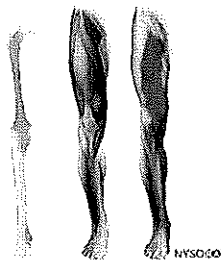
Fascial iliaca



- Indication for
 - Hip fracture
 - Knee surgery

Femoral

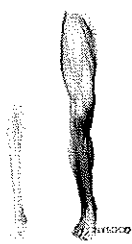
- Indications for:
 - Femur, patella, quadriceps tendon, and knee surgery
- Must evaluate for weakness in quadriceps
 - Used less frequently in total knee due to weakness



The image contains three anatomical illustrations. On the left is a single femur. In the center and right are two views of the quadriceps muscle group on a human leg, showing the vastus muscles and the quadriceps tendon. A small 'ANATOMY' logo is visible at the bottom right of the muscle diagrams.

Adductor Canal

- Indication for:
 - Knee surgery
- Less weakness than Femoral nerve block



The image contains two anatomical illustrations. On the left is a single femur. On the right is a diagram of the adductor canal on the medial side of the thigh, showing the femur, adductor muscles, and the canal through which the femoral nerve passes. A small 'ANATOMY' logo is visible at the bottom right of the canal diagram.

Knee - Suprapatella

- Indications for
 - Osteoarthritis of knee
 - Knee pain
- Steroid, local anesthetic
- Hyalurons
 - Anti-inflammatory effect
 - Increase lubrication
 - Control permeability of synovial membrane

Knee Joint - Intraoperative Injection

- Indication for
 - Total knee arthroplasty
- Medications used in combination – not standard
 - Local anesthetics, NSAIDs, Opioids,

Heel – Medial Tubercle of Calcaneus

- Indication for:
 - Plantar fasciitis
- 10% risk of plantar fascia rupture
- Very painful

Torso blocks

- Epidural Spinal
- Intercostal
- TAPQL – Transversus Abdominis Plane & Quadratus Lumborum
- Celiac plexus

Epidural vs Spinal

Epidural

- "Potential" space
 - Epidural fat and veins
- 1/10 of IV

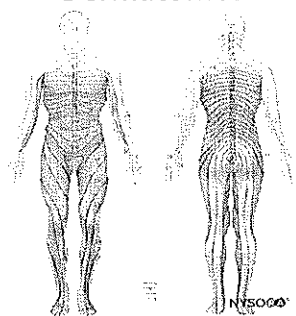
Spinal

- Cerebral spinal fluid
- 1/100 of IV

Applications Using Epidurals

Specialty	Surgical Procedure
Orthopedic surgery	Major hip and knee surgery, pelvic fractures
Obstetric surgery	Cesarean delivery labor analgesia
Gynecologic surgery	Hysterectomy, pelvic floor procedures
General surgery	Breast, hepatic, gastric, colonic surgery
Pediatric surgery	Inguinal hernia repair, orthopedic surgery
Ambulatory surgery	Foot, knee, hip, anorectal surgery
Cardiothoracic surgery	Thoracotomy, esophagectomy, thymectomy, coronary artery bypass grafting (on and off pump)
Urologic surgery	Prostatectomy, cystectomy, lithotripsy, nephrectomy
Vascular surgery	Amputation of lower extremity, revascularization procedures

Dermatomes



Intercostal

- Indicated for
 - Rib fractures
 - Postsurgical pain after chest and upper abdominal surgery

TAPQL

- Indicated for
 - Large-bowel resection, open/laparoscopic appendectomy, and cholecystectomy
 - Cesarean section, total abdominal hysterectomy

Celiac Plexus

- Indicated for:
- Abdominal pain
 - Cancer
 - Chronic Pancreatitis
- Side effects
 - Hypotension
 - Diarrhea (blocking of sympathetic fibers)

Let's Play Jeopardy!
