Femoral Nerve Catheter for Hip Fracture

Protocol:

1. Emergency department physician will contact the pain doc directly or call 53783 to request femoral nerve block for hip fracture.
2. Indications are discussed physician to physician: type of fracture, probable surgery time, comorbidities, coagulopathy, VTE prophylaxis, intact neuro exam, etc.
3. Pain doc places PNC, typically in patient’s hospital room, SOI. If there is no pain doc the schedule runner will triage resources. If a catheter cannot be placed because of a lack of manpower, then a single shot should be considered.
4. Make sure the patient is added to the PNC pain list and a sheet is added to the folder to ensure follow up. We are now responsible for the patient’s pain control, i.e., all pain orders. Consider: PO APAP, gabapentin 600 mg PO, prn opioids. Although the point is to minimize opioids, some patients will still need some.

Technique: The easiest place to block it is right near the femoral crease. If you scan too high the nerve will be deep, coming from the plexus. If you go too low you will be near the surgical field, and artery profunda and superficial artery will branch as you go inferiorly. Remember to get it underneath fascia iliaca. Try to stat lock and tape it above the crease, so it can be kept during the surgery.

Reasoning: Many of the patients sustaining hip fractures are elderly and often medically complicated. Various complications from hip fractures are well documented. These complications include mobilization related issues such as VTE, pressure ulcers, pneumonia, and UTI. There are also problems related to treatment of pain with opioids. These include respiratory depression/failure,
delirium, and confusion. Many of these risks can be minimized by regional anesthesia such as femoral nerve catheter or single shot 3 in 1 block.

**Fractures:** The most common types of hip fractures are due to trauma from side impact such as in a fall or motor vehicle crash. Hip fractures are considered separately from acetabular fractures, although these can present concomitantly. Hip fractures are often described as **intracapsular** (femoral head or neck fractures) or **extracapsular** (intertrochanteric or subtrochanteric)(see diagrams below). There is evidence that a 3 in 1 nerve block or femoral never catheter can provide analgesia statistically significantly better than conventional systemic means (NSAIDs, APAP, opioids) with fewer unwanted side effects. Despite the fact that the femoral nerve does not innervate the areas affected directly by the fracture, blocking the femoral nerve at the inguinal crease either with a continuous nerve catheter or by a single shot block does work (see below). It may have less efficacy for intracapsular fractures, but it still appears to work better than conventional systemic measures. This may be mediated by the spread of local to other nerves such as the obdurator or simply by limiting femoral muscle spasm. Whatever the mechanism, the block works.

### Relevant Paper(s)

<table>
<thead>
<tr>
<th>Author, date and country</th>
<th>Patient group</th>
<th>Study type (level of evidence)</th>
<th>Outcomes</th>
<th>Key results</th>
<th>Study Weaknesses</th>
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</thead>
<tbody>
<tr>
<td>Finlayson BJ and Underhill TJ, 1988, UK</td>
<td>36 patients age range 31 - 95 with fractured neck of femur. Intracapsular (16) and extracapsular (20) Femoral nerve block (10ml 0.5% bupivocaine)</td>
<td>Cohort Study</td>
<td>Subjective Assessment</td>
<td>26 patients had reduced pain (14 intracapsular, 12 extracapsular), 4 had no pain (all extracapsular), 6 had no change (all intracapsular)</td>
<td>No control group Statistical significance not assessed, Heterogenous group of patients (2 young patients, 1 with multiple injuries)</td>
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<td>Haddad FS and Williams RL, 1995, UK</td>
<td>50 patients with extracapsular fractures of the femoral neck, age range 68 - 89</td>
<td>RCT</td>
<td>Mean pain score using VAS</td>
<td>Extracapsular) Complications None found Greater reduction in nerve block group - statistically significant at 15 mins and 2 hours Significantly reduced in nerve block group Reduced in the 24 hours from admission in nerve block group</td>
<td>Small number of patients Only extracapsular fractures included? Optimal analgesia given to control group</td>
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<td>Chudinov A et al, 1999, Israel</td>
<td>40 consecutive patients age 67 - 96 years with fractured neck of femur undergoing surgery. Continuous psoas compartment block (2mg/kg/ of 0.25% bupivocaine with 0.8ml/kg adrenaline) vs analgesia</td>
<td>RCT</td>
<td>Pain relief (VAS)</td>
<td>Complication Rate 3 cases of local erythema in psoas group</td>
<td>Method of randomisation unclear Small numbers of patients Unblinded Unclear whether optimal analgesia given to control group Type of block not typically used in emergency setting</td>
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<td>Parker MJ et al, 2000, UK</td>
<td>269 patients from 7 randomised or quasi-randomised trials with fractured neck of femur - analgesia/anaesthesia</td>
<td>Systematic Review</td>
<td>Pain Levels Analgesic Requirements</td>
<td>Reduction in mean pain score in nerve block group Reduced analgesic</td>
<td>Heterogenous group of patients Trials involving both pre and post operative patients were</td>
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<td>given pre-operatively in 2 of these trials. Patients given either regional block or intravenous analgesia.</td>
<td>requirements in nerve block group</td>
<td>assessed together</td>
<td>Different forms of block used in different trials</td>
<td>Small numbers in contributing studies Unclear if amount of parenteral analgesia given was optimal</td>
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Complication Rate: No difference

Types of hip fractures:

![Types of hip fractures diagram](image)

1. Subcapital neck fracture
2. Transcervical neck fracture
3. Intertrochanteric fracture
4. Subtrochanteric fracture
5. Fracture of the greater trochanter
6. Fracture of the lesser trochanter

Detail of right hip:

- Acetabulum - the socket in the pelvis bone
- Cartilage
- Head of femur
- Strong ligaments that attach the top of the femur to the pelvis are not shown for clarity
- Femur
- Joint capsule