

# Administration Case Report: ACL Reconstruction Surgery

This case report represents the individual experience of Dr F. Alan Barber, and is intended to demonstrate his methodology for using EXPAREL in patients undergoing anterior cruciate ligament (ACL) reconstruction surgery.

Pacira BioSciences, Inc. recognizes that there are alternative methodologies for administering local anesthetics, as well as individual patient considerations when selecting the dose for a specific procedure.

EXPAREL is a local anesthetic that produces postsurgical analgesia in patients aged 6 years and older. It is administered via single-dose infiltration. When infiltrated into the surgical site, it produces local analgesia. It may also be infiltrated in the fascial plane to produce regional analgesia as a regional field block. Regional anesthetic techniques to produce regional analgesia include, but are not limited to, transversus abdominis plane (TAP) block, pectoralis (PEC) and serratus anterior plane (SAP) blocks, erector spinae plane (ESP) block, and quadratus lumborum (QL) block. EXPAREL may also be administered in adults as an interscalene brachial plexus nerve block, a sciatic nerve block in the popliteal fossa, and an adductor canal block to produce postsurgical regional analgesia.

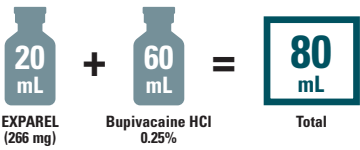
## CASE INFORMATION

<b>Physician Name</b>	F. Alan Barber, MD, FACS
<b>Affiliation</b>	Plano Orthopedic and Sports Medicine Center, Plano, TX
<b>Surgical Case Performed</b>	Bone-patellar tendon-bone ACL reconstruction
<b>Inpatient or Outpatient Procedure</b>	Outpatient

## PATIENT CHARACTERISTICS

<b>Gender</b>	Female
<b>Age</b>	39 years
<b>Patient History and Characteristics</b>	Patient sustained a twisting valgus stress to her right knee while playing tennis. She had a second buckling episode and underwent physical therapy for 2 weeks. During therapy the patient felt a pop, which caused increasing medial knee pain. An MRI showed a torn medial meniscus and a complete ACL tear

## PROCEDURAL DETAILS

<b>Incision Size</b>	Midline 4-cm incision, several portals
<b>Dose of EXPAREL and Total Volume Used</b>	 <p>20 mL EXPAREL (266 mg) + 60 mL Bupivacaine HCl 0.25% = 80 mL Total</p>

## MULTIMODAL ANALGESIA PROTOCOL

<b>Preoperative Medications Used</b>	PO acetaminophen 1000 mg, PO gabapentin 300 mg, PO meloxicam 15 mg*
<b>Intraoperative Medications Used</b>	20 mL EXPAREL (266 mg) + 60 mL bupivacaine HCl 0.25%, IV midazolam 2 mg, IV fentanyl 100 mcg, IV dexamethasone 10 mg, IV ondansetron 4 mg, IV ketorolac 30 mg
<b>Postoperative Medications Used</b>	PO gabapentin 300 mg nightly for 5 days, PO acetaminophen 1000 mg q8h for 10 days, PO meloxicam 15 mg daily for 3 days, <sup>†</sup> PO oxycodone 10 mg prn twice daily x 6 tablets

IV=intravenous; MRI=magnetic resonance imaging; PO=by mouth; prn=as needed; q8h=every 8 hours.

\*Surgeons may choose to use PO celecoxib 200 mg in place of PO meloxicam 15 mg.

<sup>†</sup>Surgeons may choose to use PO ketorolac 10 mg 3 times daily for 3 days in place of PO meloxicam.

## INFILTRATION NOTES

### ASSESSED THE SIZE OF THE SURGICAL SITE AND DEPTH OF TISSUE, THEN PREPARED INJECTION MATERIALS ACCORDINGLY

In this procedure, Dr Barber determined a total volume of 80 mL would be needed to cover the surgical site. Since no adductor canal block was performed in this case, he expanded 20 mL of EXPAREL<sup>®</sup> (bupivacaine liposome injectable suspension) with 60 mL of bupivacaine HCl 0.25%. Bupivacaine HCl was added to provide early-onset analgesia and bridge the time to onset of the long-acting local analgesia provided by EXPAREL.



If admixing with bupivacaine HCl 0.5%, use normal saline to account for the difference in concentration and ensure a total volume of 80 mL. For example, 60 mL bupivacaine HCl 0.25% can be replaced with 30 mL of bupivacaine HCl 0.5% + 30 mL normal saline to achieve the same volume and concentration of the mixture.

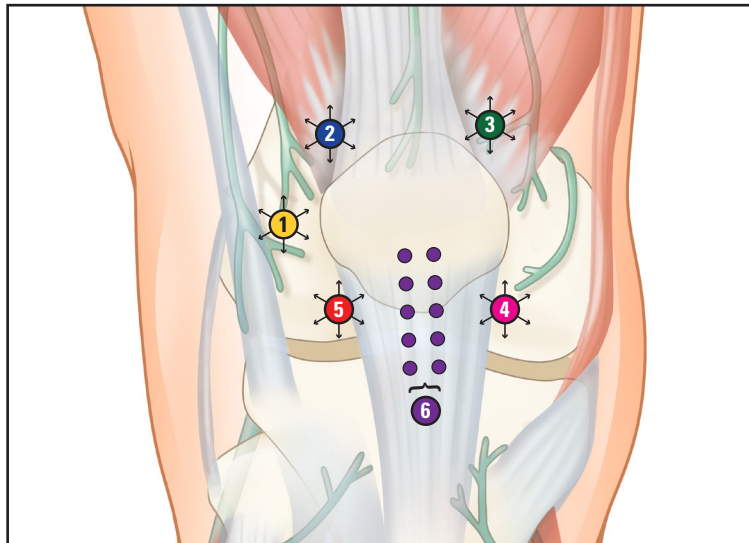
In cases where an adductor canal block is performed with bupivacaine, many surgeons will admix 20 mL of EXPAREL with 30 mL of bupivacaine HCl 0.25% and 30 mL of normal saline, for a total of 80 mL.

### DIVIDED INJECTATE INTO SYRINGES WITH NEEDLE SIZES APPROPRIATE FOR INFILTRATION (20- TO 25-GAUGE) AND PLANNED WHICH AREAS TO INFILTRATE WITH EACH INJECTION

For this procedure, Dr Barber divided the injectate into a total of four 20-mL syringes, 2 using 21-gauge 1.5-inch needles and 2 using 20-gauge 3.5-inch spinal needles.

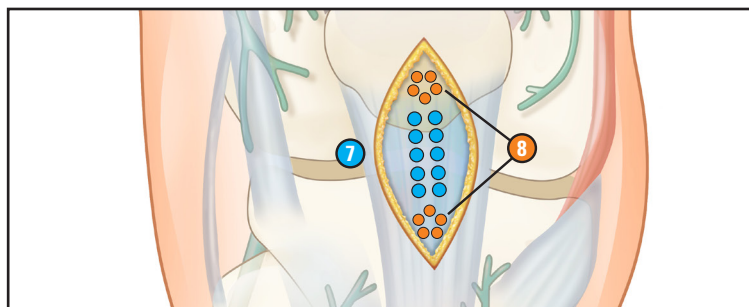


With a moving needle technique, the injections were spread in a fan-like pattern and occurred as the needle was withdrawn to maximize the coverage area. Dr Barber infiltrated as follows:



#### Preincision

- **Step #1:**  
Midpatellar lateral portal
- **Step #2:**  
Superior lateral portal
- **Step #3:**  
Superior medial portal
- **Step #4:**  
Inferior anterior medial portal
- **Step #5:**  
Inferior anterior lateral portal
- **Step #6:**  
Subcutaneous tissue along incision



#### Postincision

- **Step #7:**  
Tibial graft harvest site
- **Step #8:**  
Bone donor sites

## INFILTRATION NOTES (cont)

### Preincision

#### ■ **Step #1: Midpatellar lateral portal**

Dr Barber began by infiltrating 7 to 10 mL of EXPAREL<sup>®</sup> (bupivacaine liposome injectable suspension) around the midpatellar lateral portal using a 1.5-inch needle. He created a field block around the lateral branch of the anterior femoral cutaneous nerve by infiltrating 1.5 mL of EXPAREL every 1 to 2 cm.

#### ■ **Step #3: Superior medial portal**

Using a 3.5-inch spinal needle, Dr Barber infiltrated 7 to 10 mL of EXPAREL to create a field block of the anterior femoral cutaneous nerve where it branches into the intermediate and medial branches. Starting from the superior medial portal, he infiltrated in an arc across the lateral side of the patella to merge with the superior lateral portal site.

#### ■ **Step #5: Inferior anterior lateral portal**

He then infiltrated 7 to 10 mL of EXPAREL into the subcutaneous tissue surrounding the inferior anterior lateral portal site using a 1.5-inch needle. Dr Barber made sure to reach the posterior and inferior lateral tissues and merge this area with the medial portal infiltration area.

#### ■ **Step #2: Superior lateral portal**

He then infiltrated 7 to 10 mL of EXPAREL into the areas around the superior lateral portal using a 3.5-inch spinal needle. This created a field block of the lateral and intermediate branches of the anterior femoral cutaneous nerve, as well as the femoral pin exit.

#### ■ **Step #4: Inferior anterior medial portal**

Dr Barber then infiltrated 7 to 10 mL of EXPAREL around the inferior anterior medial portal using a 1.5-inch needle. He infiltrated every 1 cm around the portal to establish a field block of the infrapatellar branch of the saphenous nerve.

#### ■ **Step #6: Subcutaneous tissue along incision**

Dr Barber then infiltrated 7 to 10 mL of EXPAREL to establish a field block around the graft harvest sites. He made sure to infiltrate around the incision line and tissues overlying the harvest locations for both patellar and tibial grafts.

### Postincision

#### ■ **Step #7: Tibial graft harvest site**

Using a 3.5-inch spinal needle, Dr Barber infiltrated 7 to 10 mL of EXPAREL around the tibial graft harvest site, making sure to infiltrate into the periosteum and subcutaneous tissues.

#### ■ **Step #8: Bone donor sites**

After harvesting the grafts, the bone donor sites were infiltrated with 7 to 10 mL of EXPAREL under direct visualization. Dr Barber then closed the tendon and covered the donor sites with available tissue. The remaining fluid should be injected into these donor sites, leaving some fluid in place.

**INFILTRATION NOTES (cont)**

Watch Dr Barber infiltrate with **EXPAREL** at [www.EXPARELpro.com](http://www.EXPARELpro.com)

The recommended dose of EXPAREL for infiltration in adults is based on the size of the surgical site, the volume required to cover the area, and individual patient factors that may impact the safety of an amide local anesthetic. The maximum dose of EXPAREL should not exceed 266 mg. The recommended dose of EXPAREL for patients aged 6 to <17 years old is 4 mg/kg, up to a maximum of 266 mg. The recommended dose of EXPAREL in adults for interscalene brachial plexus nerve block, sciatic nerve block in the popliteal fossa, and adductor canal is 133 mg. The recommended dose of EXPAREL in adults for adductor canal block is 133 mg (10 mL) admixed with 50 mg (10 mL) of 0.5% bupivacaine HCl, for a total volume of 20 mL.

EXPAREL can be administered unexpanded (20 mL) or expanded to increase volume up to a total of 300 mL (final concentration of 0.89 mg/mL [ie, 1:14 dilution by volume]) with normal (0.9%) saline or lactated Ringer's solution.

Bupivacaine HCl (which is approved for use in patients aged 12 and older) may be administered immediately before EXPAREL or admixed in the same syringe, as long as the ratio of the milligram dose of bupivacaine HCl to EXPAREL does not exceed 1:2. Admixing may impact the pharmacokinetic and/or physicochemical properties of EXPAREL, and this effect is concentration dependent. The toxic effects of these drugs are additive and their administration should be used with caution, including monitoring for neurological and cardiovascular effects related to local anesthetic systemic toxicity. Other than with bupivacaine, EXPAREL should not be admixed with other drugs prior to administration.

**Indication**

EXPAREL® (bupivacaine liposome injectable suspension) is indicated to produce postsurgical local analgesia via infiltration in patients aged 6 years and older and regional analgesia in adults via an interscalene brachial plexus nerve block, sciatic nerve block in the popliteal fossa, and an adductor canal block. Safety and efficacy have not been established in other nerve blocks.

**Important Safety Information**

EXPAREL is contraindicated in obstetrical paracervical block anesthesia.

Adverse reactions reported in adults with an incidence greater than or equal to 10% following EXPAREL administration via infiltration were nausea, constipation, and vomiting; adverse reactions reported in adults with an incidence greater than or equal to 10% following EXPAREL administration via nerve block were nausea, pyrexia, headache, and constipation.

Adverse reactions with an incidence greater than or equal to 10% following EXPAREL administration via infiltration in pediatric patients six to less than 17 years of age were nausea, vomiting, constipation, hypotension, anemia, muscle twitching, vision blurred, pruritus, and tachycardia.

Do not admix lidocaine or other non-bupivacaine local anesthetics with EXPAREL. EXPAREL may be administered at least 20 minutes or more following local administration of lidocaine.

EXPAREL is not recommended to be used in the following patient populations: patients <6 years old for infiltration, patients younger than 18 years old for nerve blocks, and/or pregnant patients.

Because amide-type local anesthetics, such as bupivacaine, are metabolized by the liver, EXPAREL should be used cautiously in patients with hepatic disease.

**Warnings and Precautions Specific to EXPAREL**

Avoid additional use of local anesthetics within 96 hours following administration of EXPAREL.

EXPAREL is not recommended for the following types or routes of administration: epidural, intrathecal, regional nerve blocks **other than interscalene brachial plexus nerve block, sciatic nerve block in the popliteal fossa, and adductor canal block**, or intravascular or intra-articular use.

The potential sensory and/or motor loss with EXPAREL is temporary and varies in degree and duration depending on the site of injection and dosage administered and may last for up to 5 days, as seen in clinical trials.

**Warnings and Precautions for Bupivacaine-Containing Products**

**Central Nervous System (CNS) Reactions:** There have been reports of adverse neurologic reactions with the use of local anesthetics. These include persistent anesthesia and paresthesia. CNS reactions are characterized by excitation and/or depression.

**Cardiovascular System Reactions:** Toxic blood concentrations depress cardiac conductivity and excitability, which may lead to dysrhythmias, sometimes leading to death.

**Allergic Reactions:** Allergic-type reactions (eg, anaphylaxis and angioedema) are rare and may occur as a result of hypersensitivity to the local anesthetic or to other formulation ingredients.

**Chondrolysis:** There have been reports of chondrolysis (mostly in the shoulder joint) following intra-articular infusion of local anesthetics, which is an unapproved use.

**Methemoglobinemia:** Cases of methemoglobinemia have been reported with local anesthetic use.

**Disclosure:** Dr Barber is a paid consultant for Pacira BioSciences, Inc.

**Full Prescribing Information is available at [www.EXPARELpro.com](http://www.EXPARELpro.com).  
For more information, please visit [www.EXPARELpro.com](http://www.EXPARELpro.com) or call 1-855-793-9727.**