

# Bilateral PECS II Blocks with Continuous Local Analgesia for Traumatic Sternal and Bilateral Rib Fractures



## Introduction

### Sternal fractures

- impaired ventilation predisposing to pneumonia
- non-union

Overall mortality for isolated sternal fractures is 3.5%<sup>1</sup>

With concomitant injuries as high as 22%<sup>1</sup>

- thoracic fractures
- pulmonary contusions
- blunt cardiac injury

Adequate analgesia is key to recovery. Reduction of opioid burden rapidly becoming a focus across the country

Side effects of pain medications present high risk for complications, especially with the elderly



Image 1: Pre-procedure chest x-ray shows consolidation of bilateral lung fields, attributed to poor ventilation

	Pre Procedure	Post Procedure
Subjective Pain Score	7-10/10	4-5/10
Demand Opioid Use (Hydromorphone)	3.2 mg/12 h	7 mg/24 h
Incentive Spirometer Max Volume	300 mL	1200-1500 mL

Table 1: Pre- (12 hour) and Post-Procedure (12-48 hours) Pain score, Opioid use, and Incentive spirometer max volume

## Discussion

The PECS block, initially described for analgesia after breast surgery, attempts to block sensation and alleviate muscle spasm in the upper chest. Among the modifications, the PECS II block attempts to target the pectorals, the intercostobrachial, intercostals 2-6, and the long thoracic nerves, additionally covering the axilla.<sup>2</sup>

In this block, ultrasound guidance is used to localize the plane just lateral to the pectoralis minor between the serratus anterior and ribs 2-4, and local anesthetic is deposited. As initially described, the effect typically lasts approximately 8 hours.<sup>2</sup>

In this case we placed catheters for continuous local anesthetic infusions, which provided analgesia over the following week. Subpectoral Interfascial plane and Serratus plane blocks were either made difficult by habitus or would not cover enough of the injured area.

Our case also showed not only improved analgesia for multiple rib fractures but also decrease of sternal fracture pain, something not previously described.<sup>3</sup> To date, no published studies describe a PECS II block with catheter for continuous analgesia in this fashion, our case showed adequate analgesia and reduced opioid requirement over 7 days. As such, this block represents a potent tool to treat pain in a multimodal analgesia regimen when other methods of regional anesthesia are contraindicated or otherwise unavailable.

## Case

73 year old Female admitted to the Trauma ICU after MVC

- sternal fracture, retrosternal hematoma
- right pneumothorax
- rib fractures (1-9 Right side, 3-9 left side)
- left distal radius fracture, left 4th & 5th metacarpal fracture
- grade 2 splenic laceration
- right pelvic sidewall hematoma
- scalp laceration x2

- PMH
- Coronary Artery Disease with Myocardial Infarction x3, s/p Percutaneous Coronary Intervention (PCI) x (last PCI 8 years prior, on Plavix)
  - Hypertension
  - Diverticulosis
  - Lung Ca s/p partial resection (in remission)
  - Anxiety/Depression

Severe pain interspersed between periods of oversedation and respiratory depression while on a patient-controlled opioid infusion

**Bilateral PECS II blocks with continuous infusion catheters placed**  
20mL of 0.2% ropivacaine initially  
infusion of 0.2% ropivacaine at 6 mL/hr titrating for pain control

Pre- and post-procedure pain, demand opioid use, and incentive spirometer volumes are listed in Table 1.

The rest of her hospital course was uncomplicated. The Left catheter was removed on day 6 and the Right catheter was removed on day 7 without issue.

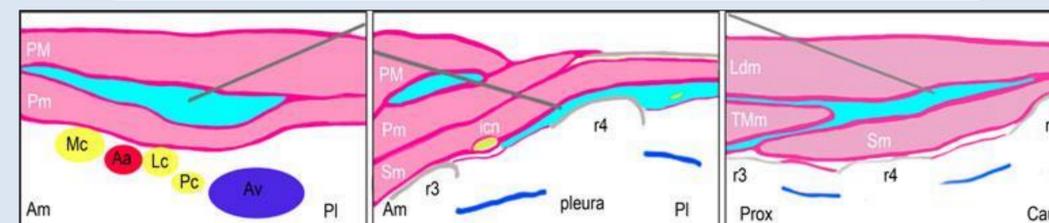
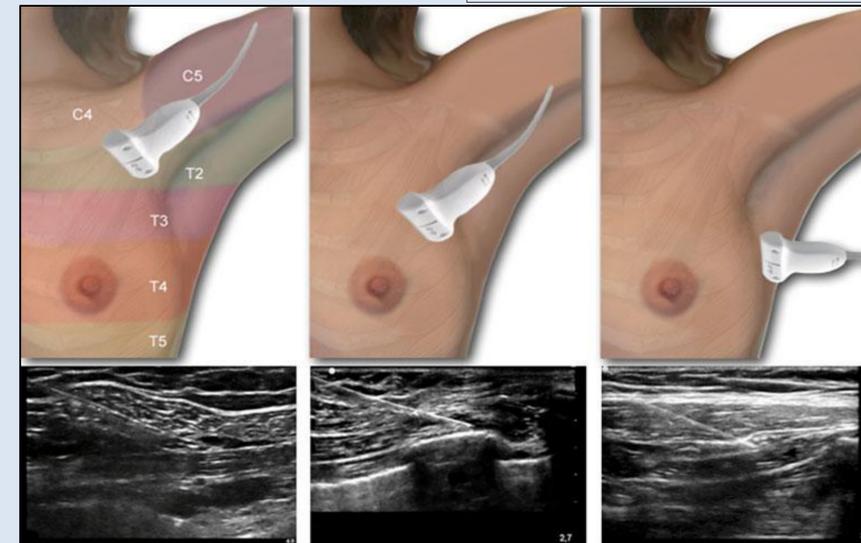


Image 2 and 3: Ultrasound transducer locations, example sonographic images, and illustration of layers for anesthetic deposition in PECS I (left), PECS II (middle), and Serratus (right) blocks as described by Blanco, Et al.<sup>4</sup>

## References

1. Yeh DD, et al. Sternal fracture--an analysis of the National Trauma Data Bank. The Journal of surgical research 2014;186:39-43.
2. Blanco R, et al. Ultrasound description of Pecs II (modified Pecs I): a novel approach to breast surgery. Revista espanola de anestesiologia y reanimacion 2012;59:470-5.
3. Raza I, et al. Bilateral Subpectoral Interfascial Plane Catheters for Analgesia for Sternal Fractures. Regional anesthesia and pain medicine 2016;41:607-9.
4. Blanco R, et al. Serratus plane block: a novel ultrasound-guided thoracic wall nerve block. Anaesthesia 2013;68:1107-13.