



Unlocking Common ED Procedures

Resuscitative Thoracotomy in the ED

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- Rapid application of skin preparation should be applied over the entire chest and abdomen (ie. Betadine, chlorhexidine). However, this should not delay the start of the thoracotomy.
- Identify the 4th or 5th intercostal space (one rib space below the nipple line in males or below the inframammary fold in females), and make an anterolateral incision beginning at the sternum following the rib curvature to the left posterior axillary line.
- The lung should be held away from the chest wall while the rest of the layers of the chest wall (musculature, parietal pleura) are cut through using mayo scissors. These layers should not be cut with the scalpel due to risk of lacerating the heart and lungs.
- The incision is opened using a Finochietto retractor or rib spreaders to maximal expansion for sufficient exposure. The rib spreaders should be inserted such that the hand crank and long metal bar are lateral to the incision made with the bar pointing towards the feet to enable maximal exposure.
- A pericardiotomy is performed next by lifting the pericardium with forceps and making a midline, longitudinal incision through the pericardial sac using scissors. During this step is important to avoid damaging the phrenic nerves, which are located in the lateral walls of the pericardial sac.
- Next the heart is exposed and all blood and clot should be evacuated from the pericardial sac.
- The heart is inspected systematically for cardiac defects. Bleeding should be controlled through temporary occlusion with gauze or overlying pressure held by a finger.

- Defects greater than 1cm can be temporarily tamponaded by a foley balloon. If these measures do not achieve hemostasis, a minimal amount of sutures (non-absorbable size 0/0 or 1/0 monofilament or braided) can be used. It is important to avoid ligating the coronary arteries during this step.
- If the heart does not resume beating spontaneously, cardiac massage should be initiated with two handed technique directing blood towards the aortic route at approximately 80 bpm.
- The fascia surrounding the aorta should be bluntly dissected for optimal visualization of aortic structure, then a vascular clamp should be applied for temporary cross clamping.
- If after performing left anterior thoracotomy no injury is identified, poor visualization is present, or there is high suspicion of injury causing hemodynamic collapse in the right chest, the incision should be extended to the right side.
- Another anterolateral incision should be made beginning at the sternum extending to the right posterior axillary line along the 4th or 5th rib curvature to complete the bilateral thoracotomy.
- The remaining layers of the chest wall (musculature, parietal pleura) are cut through using mayo scissors.
- The sternum must be transected using a Gigli saw, Lebsche knife, trauma shears, or mayo scissors to gain full exposure.
- The incision is opened using a Finochietto retractor or rib spreaders to maximal expansion for sufficient exposure.
- The right thorax can then be inspected for inspected for injury and bleeding vasculature which can be clamped.
- If return of spontaneous circulation occurs, bleeding through the internal mammary arteries will occur, and the patient can be taken to the operating room for definitive management.



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