



PROCEDURE CHECKLIST

Resuscitative (clamshell) thoracotomy

Emergency bilateral anterior (clamshell) thoracotomy in traumatic cardiac arrest to release tamponade, control intrathoracic haemorrhage and allow internal cardiac massage.



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Patient reference	Date	Time	Completed by
Equipment ready			
☐ Personal protective equipment: gown, eye protection, gloves (double gloving advised)			
☐ Thoracotomy set: scalpel (size 22 or 10 blade), heavy curved scissors (e.g. trauma shears or Mayo), Gigli saw with handles or sternal shears			
☐ Rib spreader (Finochietto retractor)			
☐ Toothed forceps, large vascular clamps and swabs			
☐ Suture material, skin stapler and Foley catheters for temporary wound control			
☐ Internal defibrillation paddles			
☐ Suction with large-bore tips			
☐ Chlorhexidine skin preparation (a quick splash only — do not delay)			
☐ Massive haemorrhage protocol activated, rapid infuser and blood products			
Before · Decision			
☐ Confirm traumatic cardiac arrest or loss of signs of life, the mechanism and the time since signs of life were lost.			
☐ Use point-of-care ultrasound if it will not delay: look for tamponade and cardiac activity.			
☐ Make a clear team leader decision and announce it: 'We are doing a clamshell thoracotomy.'			
☐ Activate the massive haemorrhage protocol and call the surgical team and theatre.			
☐ Treat other reversible causes in parallel: airway and ventilation, bilateral thoracostomies, pelvic binder, haemorrhage control, blood.			
☐ Do not perform chest compressions as the main treatment of traumatic arrest from hypovolaemia or tamponade; prioritise simultaneous treatment of reversible causes.			
External compressions do not work in an empty or tamponaded heart.			
Before · Preparation			
☐ Intubate and ventilate (or continue ventilation) — this must not delay the thoracotomy.			
☐ Position the patient supine with both arms abducted to 90° or above the head.			
☐ Everyone in the room puts on personal protective equipment; the operator double gloves.			
☐ Splash skin preparation over the chest; do not spend time on formal sterile draping.			
During · Incision			
☐ Perform bilateral finger thoracostomies in the fourth or fifth intercostal space at the mid-axillary line (if not already done).			
☐ Join the thoracostomies with a single skin incision along the fourth or fifth intercostal space across the sternum, curving slightly down in the midline (in women, along the inframammary fold).			
☐ Cut through the intercostal muscles and pleura with heavy scissors along the upper border of the rib, from each thoracostomy towards the sternum.			
☐ Divide the sternum transversely with the Gigli saw, shears or heavy scissors.			
☐ Open the chest like a clamshell and insert the rib spreader if available; an assistant can lift the anterior chest wall.			
☐ Protect your own hands from the sharp cut ends of ribs and sternum.			
Sharps injury risk is high; use instruments rather than fingers where possible.			
During · Pericardium			
☐ Identify the pericardium; lift it with toothed forceps to tent it away from the heart.			
☐ Incise the pericardium longitudinally in the midline, anterior to the phrenic nerves, extending up to the root of the great vessels.			
☐ Remove clot and blood from the pericardial sac by hand and suction and deliver the heart.			
☐ Look for a cardiac wound; control it with finger pressure first.			
☐ Close a cardiac wound with sutures or skin staples; a Foley catheter may be used temporarily if skilled.			
During · Haemorrhage and circulation			
☐ If the heart is not beating, start bimanual internal cardiac massage: compress the heart from apex to base between flat hands.			
☐ Defibrillate ventricular fibrillation with internal paddles placed on each side of the ventricles at low energy per the device (commonly 10–20 J, increasing if needed).			
☐ Control lung hilar bleeding with manual compression, a hilar clamp or hilar twist (senior/surgical skill).			
☐ Control massive intrathoracic haemorrhage by direct pressure and packing.			
☐ Compress the descending thoracic aorta against the spine with a hand or instrument to redirect blood flow to the brain and heart, if haemorrhage below the diaphragm is suspected.			
☐ Give blood products continuously through the rapid infuser.			
During · Return of circulation			
☐ Expect bleeding from the internal mammary (thoracic) arteries and intercostal vessels when circulation returns; clamp or ligate them.			
They are cut in every clamshell and bleed briskly once output recovers.			
☐ Consider sedation and analgesia if the patient regains consciousness.			
☐ Transfer immediately to theatre with the surgical team for definitive repair.			
After · Transfer and handover			
☐ Cover the open chest with moist sterile packs and a sterile drape for transfer.			
☐ Hand over clearly to the surgical and anaesthetic team: mechanism, timings, findings, interventions and blood products given.			
☐ Continue massive transfusion, correct coagulopathy, calcium and temperature.			
After · Termination and aftercare			
☐ Stop resuscitation if there is no cardiac activity after relief of tamponade and control of haemorrhage, and no response to internal massage and blood, as a team decision.			
☐ Account for all sharps and instruments.			
☐ Report any sharps or blood exposure to staff immediately and follow the post-exposure pathway.			
☐ Document the timings (loss of signs of life, start of thoracotomy, return of circulation), findings and interventions.			
☐ Hold a team debrief and offer staff support.			



A drafted procedure checklist, awaiting senior review. Perform procedures only within your training, competence and local policy. It does not replace your clinical judgement.

EM Orbit · Emergency medicine, in one orbit · proc-resus-thoracotomy · red rows are the steps that must not be missed