

## Vanderbilt Peri-operative Emergency Trauma Surgery Workshop for Peri-operative Staff



# Trauma CORE Essentials

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## Preface

This workbook is intended to act as a resource for the peri-operative staff

The guidebook is a work in progress and will be amended as needed by the Level One Trauma Task Force, Trauma Surgeons, Anesthesia Team, Peri-operative Education Department, and Management of the Main Peri-operative Team.

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## ***Trauma at Vanderbilt University Medical Center***

Since 1988, Vanderbilt has served as the region's only provider of level I trauma care, covering a 65,000 square mile territory. 58,000 patients have been admitted to the Trauma Center over the past 25 years, including more than 25,000 motor vehicle accident victims, nearly 4,500 gunshot victims, 1,700 stabbing victims and more than 7,000 fall victims along with a high volume of other injuries. Vanderbilt operates the region's only burn center; with 20 beds dedicated solely to burn care. Working here puts you in the center of caring for the sickest people in the region.

Patients arrive to the department via personal vehicle, helicopter and ground ambulance; they are categorized into Level I and Level II according to anatomic and physiologic criteria. Once the decision to make the patient a Level One in the Operating Room; the peri-operative Command Center is notified by the Trauma Attending and the peri-operative staff is notified by overhead paging system.

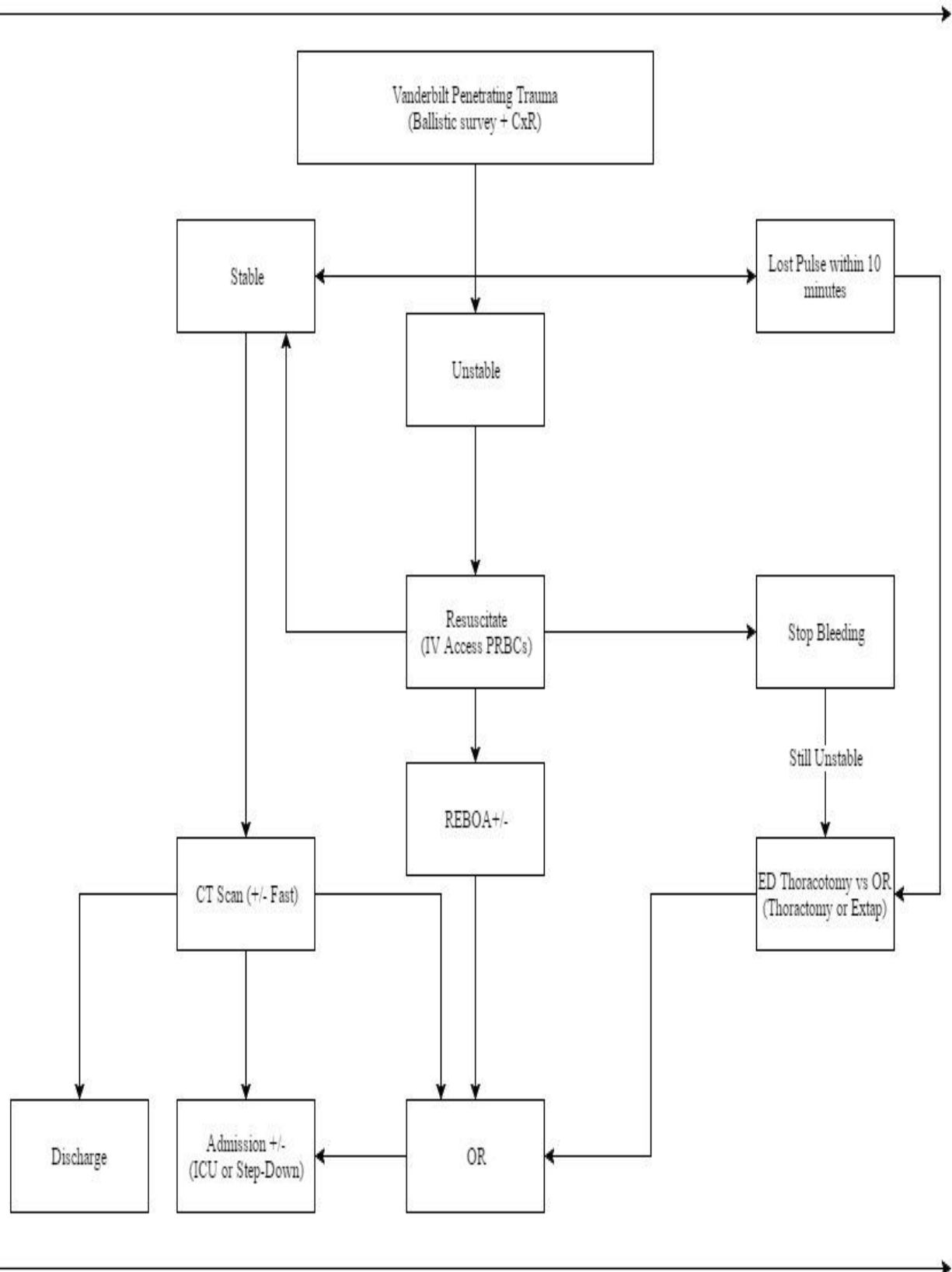
The purpose of this document is to clarify and outline the core emergency essentials of Level One Trauma operative cases and assist the peri-operative team by adding predictability into a unpredictable situation. Defining of roles and reviewing pertinent procedures that may be required by the Trauma surgeon will assist the staff to be prepared. By reviewing this book, the peri-operative staff will be better able to assist the Anesthesia team, Trauma surgical team, and each other and decrease the chaos and noise.

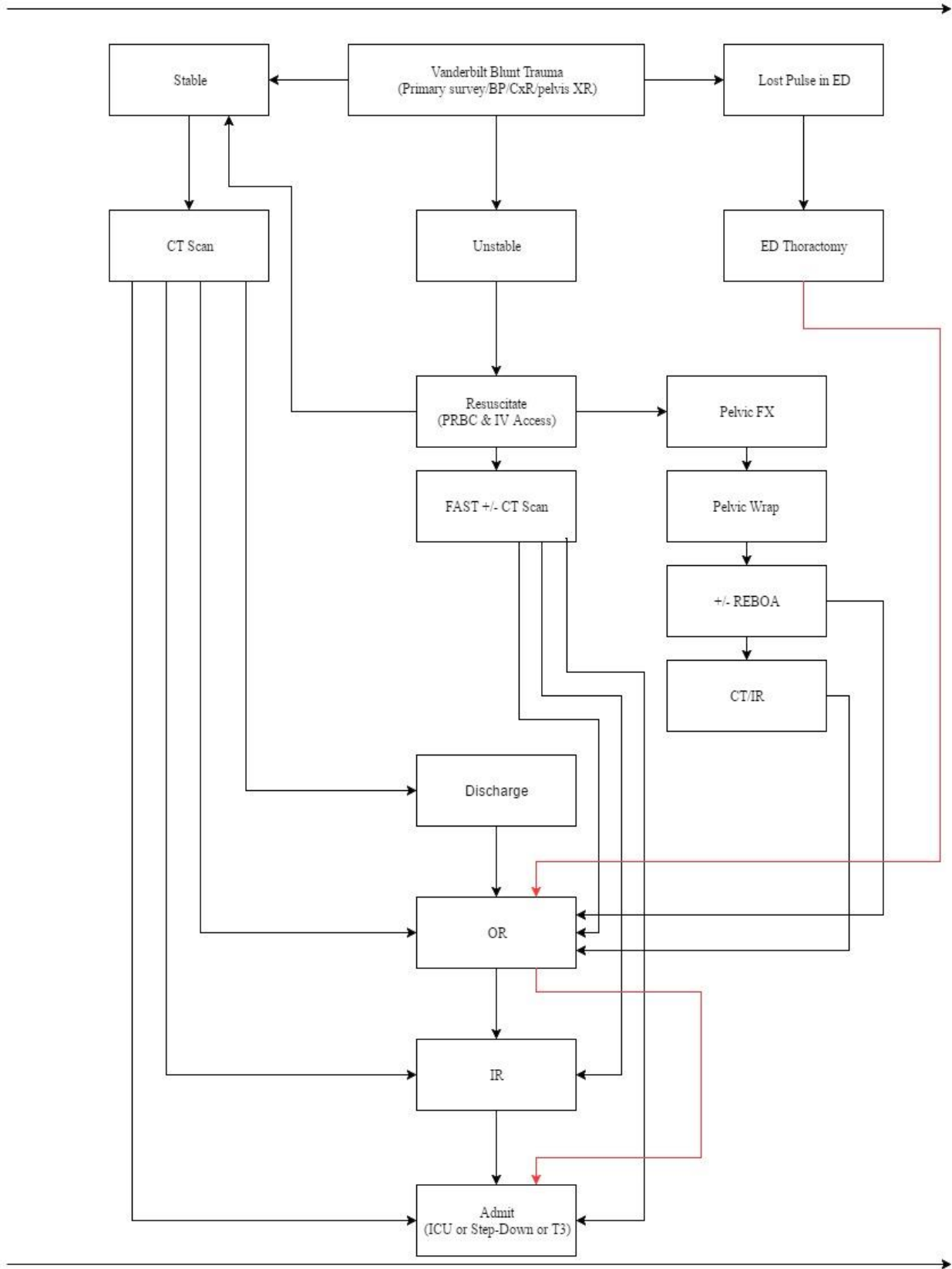
**Surgeon Objectives**

<input type="checkbox"/> <b>Control Bleeding through Packing Techniques</b>
<input type="checkbox"/> <b>Identify Injuries</b>
<input type="checkbox"/> <b>Control Contamination</b>
<input type="checkbox"/> <b>Reconstruction-If possible</b>

**Emergency Cart Location**

<b>Emergency Cart</b>	<b>Location</b>
<b>Airway Emergency Cart</b>	TVC Core; outside VOR 5
<b>Cardiac Emergency Cart</b>	Main Core; outside VOR 31, 32, &33
<b>Craniotomy Emergency Cart</b>	Main Core; outside VOR 20, 21, & 22
<b>C-Section Emergency Cart</b>	Hallway; outside VOR 30
<b>Ectopic Emergency Cart</b>	Main Core; outside VOR 28
<b>Trauma Emergency Cart 1&amp;2</b>	Hallway; outside VOR 26&30
<b>Stroke Emergency Cart</b>	TVC Core; outside VOR 1, 8 & 2
<b>Vascular Emergency Cart</b>	Ortho Core; inside CCI; outside 14





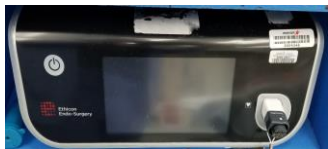




<b>Trauma Room Set Up in the Operating Room</b>	
<input type="checkbox"/>	On Prep Stands: (From Trauma Case Cart)
	○ General Lap Pan I & II on one prep stand
	○ Bookwalter Post & Bar w General Bookwalter pan on other prep stand
	○ 2 packs Towels on top of Lap Pans
	○ 2 Chlorapreps
	○ Via Guard Suction (From Trauma Bucket)
	○ 3-0 Silk 18 inch pop Suture
	○ 2-0 Silk Tie
	○ 3-0 Silk Tie
<input type="checkbox"/>	Trauma Supply Cabinet into room/ outside if no room
	○ If Locks off; contact Core Personnel to check the Trauma Supply Cabinet
<input type="checkbox"/>	Trauma Extra Instrument Cart in room
	○ Notify ORTA if instruments missing
<input type="checkbox"/>	Trauma Suture Cady in room
<input type="checkbox"/>	Warm Room to 85 degrees Fahrenheit
<input type="checkbox"/>	Bed made
	○ Underbody Bair Hugger on top (Do not tear arms off)
	○ Bair Hugger at each end of OR bed
<input type="checkbox"/>	Stryker Sternal Saw Box on Bovie Machine
	○ Turn On
<input type="checkbox"/>	Valley Triad Bovie—might need Ligasure <b>OR</b> MEGADyne Bovie—Need Harmonic Generator too!!





<input type="checkbox"/>	MegaDyne Bovie			
<input type="checkbox"/>	Harmonic Generator			
<input type="checkbox"/>	Hair Clippers loaded with razor			
<input type="checkbox"/>	3 in Silk Tape on top of Bovie			
<input type="checkbox"/>	Dornoch placed on the side of Bovie			
	o	Plug in		
	o	Manifold hanging on hook of Dornoch		
<input type="checkbox"/>	2 Headlight Boxes w Headlights on both side of OR Bed			
<input type="checkbox"/>	2 Standing Stools in OR			
<input type="checkbox"/>	Cover OR Bed base with Back Table Cover cut in half and wrap around			
<input type="checkbox"/>	SCD machine under Cover at OR Bed base			
<input type="checkbox"/>	At Computer Station for Circulator			
	o	Blank Stickers (approx. 6)		
	o	Order Sheet		
	o	Pathology Sheet		
<input type="checkbox"/>	Roller Board hung up w Bed Sheet draped over			
<input type="checkbox"/>	Argon Bovie outside OR			
	o	Check ready to use		
	o	2-10 pound Sand Bags on top Argon Bovie		
<input type="checkbox"/>	<b>LOTS OF WARM SALINE</b>			



**Difference of Bovies**

- Valley Triad Bovie:



- MegaDyne Bovie



\*\*\*If have MegaDyne Bovie; **MUST HAVE** Harmonic Generator for ENSEAL\*\*\*

- Harmonic Box



POP off Adaptor to utilize ENSEAL



## **Initiation of Level One Trauma in the Operating Room**

- A. Steps of Level One Trauma from Command Center in the Main Operating Room**
1. Attending Trauma Surgeon notifies Operating Room Command Center with either Medical Receptionist (MR) or Board Runner--Charge Nurse answering
    - a. Who the surgeon is
    - b. Patient name
    - c. Medical Record number
    - d. Level One Trauma maybe specific--ie Ex Lap, Thoracotomy, etc
    - e. Mass Transfusion Protocol (MTP) activated
    - f. Intubated or Non-intubated
    - g. Hanging up once informed which operating room take Level One Trauma
  2. Dial 872
    - a. Announce over head " Level One \_\_\_\_\_ to OR \_\_\_\_\_ "
    - b. Repeat 3 times
  3. Notify
    - a. Attending Anesthesiologist
    - b. Resident #1
    - c. Anesthesia Technician
  4. MR schedules patient into ORMIS

## **Trauma Alert and Response Guidelines**

### **Adult Trauma Level I (Trauma Alert)**

Adult Trauma Alert patients are critically ill and "Trauma Level I-Adult" is paged via FlightCom at the earliest indication that such a patient will be arriving or has arrived in the Emergency Department. For Trauma Level I patients, access to the Operating Room, CT scan and other special services will be of highest priority.

Criteria	Personnel to Respond to ED Emergency
<p><b>Airway/Breaching</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Unstable airway/unsecure airway</li> <li><input type="checkbox"/> Patients with severe maxillofacial injuries Patients requiring immediate airway intervention--Facial burns or burns with significant suspicion of inhalation injury</li> <li><input type="checkbox"/> Moderate-severe respiratory distress; sub-Q emphysema of the face, neck or chest</li> </ul> <p><b>Circulatory</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Systolic BP &lt; 90mmHg or</li> <li><input type="checkbox"/> HR &gt; 120</li> <li><input type="checkbox"/> Witnessed cardiac arrest from trauma</li> <li><input type="checkbox"/> Arterial Bleeding</li> <li><input type="checkbox"/> Spinal Shock (Hypotension &amp; normal HR with neuro deficits)</li> </ul> <p><b>CNS</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> GCS ≤ 8</li> <li><input type="checkbox"/> Head injury with LOC &gt; 5 min with one or more other physiologic derangements</li> <li><input type="checkbox"/> Known spinal cord injury</li> <li><input type="checkbox"/> Neurologic deficits with suspected spinal cord injury (any level)</li> </ul> <p><b>Chest/Abd/Pelvis</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Cardiac injury</li> <li><input type="checkbox"/> Widened mediastinum</li> <li><input type="checkbox"/> Diagnosed abdominal or pelvic injury with shock Major pelvic injury with shock</li> <li><input type="checkbox"/> Major chest wall injury such as flail chest/sucking chest wound</li> </ul>	<p>Trauma Surgeon Emergency Department Attending Chief Surgical-Trauma Resident (R4) or Trauma Fellow Junior Surgical Resident (R2) EM Resident Emergency Department Nurses (2) or Emergency Department Nurse (1) and Paramedic (1) Emergency Department Charge nurse ED Tech Respiratory Therapist X-Ray Technologist CT Technologist prepares to receive patient Social Worker when in-house</p>

<b>Criteria</b>	<b>Personnel to Respond Same as Listed Above</b>
<p>Extremities</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Multiple long bone fractures with shock</li> <li><input type="checkbox"/> Amputation of proximal extremity (not digits)</li> <li><input type="checkbox"/> Pulseless extremity with evidence of trauma</li> </ul> <p>Mechanism of Injury</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Penetrating trauma to the head, face, torso (chest, abd, buttocks, back)</li> <li><input type="checkbox"/> Ejection or thrown from any vehicle with presence of other criteria for Level I activation</li> <li><input type="checkbox"/> Fall from height &gt; 10 feet are Level II unless meeting Level I criteria</li> <li><input type="checkbox"/> High voltage electrical injury</li> <li><input type="checkbox"/> Burns &gt; 20% BSA or burns combined with any other injury</li> <li><input type="checkbox"/> Massive crush injury</li> </ul>	

**Trauma Resuscitation Operating Room Team/Personnel**

- Trauma Team Upper Level– Trauma Senior/PGY 4 or Trauma Fellow
- Trauma Attending
- Trauma Lower Level-junior surgical resident (optional)
- Anesthesia Team Leader
- Anesthesia Provider #1
- Anesthesia Provider #2
- Anesthesia Technician
- Primary Circulating RN
- Secondary Circulating RN
- Primary Surgical Technologist (Scrub Technician)

**Ancillary Personnel**

- Ancillary personnel are involved in the resuscitation with limited or no direct patient contact.
  - Care Partner-1 (CT-1)
  - ORTA
  - Core Personnel
  - Radiology Technician-takes and develops plain films as directed by the trauma team leader (must wear PPE)
  - Medical Student-tasks as assigned by the by the trauma team leader (must wear PPE)

**Prior to patient's arrival**

Primary Circulating Nurse, Primary Scrub, & Secondary Circulator

1. **Survey** operating room environment
  - a. Room Temperature 72 to 78 degrees Fahrenheit
  - b. Humidity 50 to 60 percent
2. **Equipment** available and turned on
  - a. Sternal Saw box
  - b. **Bovie** (Triad OR MEGADyne + Harmonic Generator)
    - 1b. Set at Coag 40/ Cut 40
    - 2b. Taped on top of bovie
      - 2aa. Razor
      - 2bb. 3 inch tape
  - c. Dornoch suction system
    - 1c. manifold on top of the machine
  - d. Berchtold or 3500 bed
  - e. 2 Headlight boxes with headlights
  - f. Standing Stools
  - g. Argon available outside room



3. **Supplies**

- a. **Trauma Cart:**
  - i. Trauma pack for Laparotomy Case

\*\*Vascular Pack on Top of Trauma Extra Cart available for Vascular Trauma

  - ii. General Lap 1 & 2 pans on prep table
  - iii. Bookwalter Segmented and Post & Bar Pans on second prep table

\*\*Oval Ring available in Trauma Extra Cart
- b. **Trauma Bucket:**
  - i. 35 W Staplers
  - ii. 2 Packs of Sterile Towels
  - iii. Disposable Pool Sucker/ Via Guard Suction
- c. **Trauma Suture Caddy:**
  - i. 2-0 and 3-0 Silk Ties
  - ii. 2-0 and 3-0 Silk SH Pops Suture 18 inch
- d. **Trauma Supply Cart:**
  - i. In the room



e. **Trauma Extra Instrument Cart:**

<b>Top of case cart</b>	Trauma Retractor Ankenny Minor Basic
<b>1st shelf</b>	Bookwalter Post and Bar Bookwalter Oval rings and blades Trauma Extras Instrument
<b>2<sup>nd</sup> shelf</b>	Peripheral Vascular I Peripheral Vascular II Vascular Adult Thoracotomy Instrument
<b>Bottom shelf</b>	Cardiac Stryker Sternal Saw and blade taped on top of the pan C Clamp/aortic occlude 10.0 (blue wrap) Longmire-storm liver clamp 17 ½ Adult Tracheostomy Instrument Amputation Instrument



**Specific Roles *prior to patient arrival***Primary Circulating Nurse

1. \*\*\*Delegates Roles to staff\*\*\*
2. Assist Surgical Technologist (Scrub Technician)
  - a. Open Supplies onto sterile field
  - b. Open pans on prep table

Primary Surgical Technologist (Scrub Technician)

1. Scrubs, gowns, and gloves
2. Sets up sterile table with instruments, supplies, equipment, and medications/solutions needed for procedure

Secondary Circulating Nurse:

1. Takes directions from
  - a. Primary Circulating Nurse
  - b. Surgical Technologist (Scrub Technician)
2. Assist Surgical Technologist (Scrub Technician)
  - a. Open Supplies onto sterile field
  - b. Open pans on prep table

**Immediate patient arrival**Prior to the patient placed on operating room bedPre-Brief initiated by Trauma Attending or Trauma Fellow

1. Summary of available patient information and plan of care.
2. Roles are decided
3. Excess personnel are to exit

Noise Discipline:

1. Individual conversations should be kept at a minimum
2. One voice should be heard by the entire operating room.
3. All information should be directed by the trauma and anesthesia attendings.
4. Extra personnel must exit at the point of role decision to decrease noise and chaos.



**Vanderbilt University Medical Center****Division of Trauma, Emergency Surgery, and Surgical Critical Care****Pre-Brief: Trauma Level One Operation****Introduction**

Teamwork, communication, and leadership are the keys to a well organized and efficient trauma operation.

**Noise Discipline**

Individual conversations should be kept at a minimum; the entire room should hear one voice.

**Pre-Brief**

Prior to the patient being moved onto the operating room table, a *Quick* pre-brief is suggested.

**Trauma Team Checklist:**

- Crowd Control:** Intro of Surgeons, Anesthesiologists, RNs (ED, Scrub, Circulator #1 +/- #2) [All Readback]
- Summarize Injuries, Known or Suspected
- Outline Skin Preparation, Positioning, and Surgical Draping [Scrub/Circulator Team Readback]
- Request or Confirm Instruments, Trays, Equipment [Scrub/Circulator Team Readback]
- Request Antibiotic & DVT prophylaxis (and Re-dosing plans) [Anesthesia Team Readback]
- Summarize pre-OR Resuscitation (IVF, Blood, Massive Transfusion, Colloid, Rewarming with Response)

**Delivering Nursing Team (from Emergency Room, ICU, Ward) Checklist:**

- Clarify any pre-OR Resuscitation (IVF, Blood, Massive Transfusion, Colloid and Response)
- Summarize pre-OR sedation and analgesia (Requirements and Response)
- Outline Intravenous/Intraosseous Access
- Relay any threat features (e.g., weapons, hazardous materials, prisoner, restraints)
- Hand-off Blue Identification Card to Receiving Nursing Team [Circulator Readback]

**Receiving Nursing Team (OR Scrub/Circulator) Checklist:**

- Ask for clarification about above
- Outline plan for any threat features
- Designate point-person for Pagers, Phones, and Consultant Communication (e.g. Radiology, Bloodbank)

**Anesthesiology Team Checklist**

- Ask for clarification about above
- Relay new Access plans (e.g., Intravenous, Central line, Arterial line, Intraosseous)
- Outline OR Resuscitation and Rewarming plan

**Move Patient to Operating Room table****Oversight:**

Dept. of Surgery, Division of Trauma, Trauma Program Operational Process Performance (10/26/2016)

**Revision Team:**

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***Last revision: October 28, 2016***

**Trauma Team****Trauma Attending**

1. Works with the Anesthesia Attending to enable ongoing resuscitation of the patient
2. Supervision of trauma team
3. Designated trauma triage officer responsible for directing flow of patients from OR

**Trauma Team Upper Level (Senior Surgical Resident or Trauma Fellow)**

1. Aid in overall resuscitative efforts
2. Initiation of the operative case
3. Assists with procedures/interventions

**Trauma Team Lower Level (Junior Surgical Resident)**

1. Aid in set up and initiation of the operative case
2. Assists with procedures/interventions

**Anesthesia Team****Anesthesia Team Leader: (Attending Anesthesiologist)**

1. Assigning roles to each of the other team members involved in the resuscitation
2. Provide expert clinical guidance and supervision to the team providers for the performance of all trauma interventions
3. Responsible for all decisions made in the care of the patient
4. Maintain an open line of communication with the trauma surgeons throughout the resuscitation
5. Consult with the trauma attending in regard to any major decisions
6. Relating to the patient's care
  - a. Include the decision to discontinue resuscitative efforts

**Anesthesia Provider #1:**

1. Prepare all anesthesia equipment
  - a. Ventilator
  - b. IV pump
2. Items for intubation
3. Prepare all drugs for rapid sequence intubation
4. Perform all airway maneuvers as dictated by the Anesthesia Team Leader
5. Responsible for all ventilator settings
6. Security of in-situ airway devices
7. Maintain the patient at an appropriate anesthetic plane
8. Maintain hemodynamic stability by careful titration of anesthetic agents and vasoactive medications

Anesthesia Provider #2

1. Ensures appropriate vascular access
2. All existing peripheral intravenous lines are patent, functional, and of an appropriate size for the patient's condition.
3. IF Massive Transfusion Protocol (MTP) activated
  - a. Obtain large-bore venous access for high-volume resuscitation
4. Responsible for obtaining invasive arterial pressure monitoring, as appropriate

Anesthesia Technician:

1. Set up and manage the Belmont Rapid Infuser
2. Hang blood products as directed by the Team Leader
3. Perform arterial blood gas analysis
4. Perform thromboelastography
5. Perform any other appropriate point-of-care testing deemed necessary by the resuscitation team
6. Ensuring that the transesophageal echocardiograph probe and machine are available

Operative TeamPrimary Circulating Nurse or Secondary Circulator

1. Check Blue Card (will be taped to monitor at end of stretcher); [if available] against arm band
  - a. If not a Blue Card; will be a sticker with patient name, medical record number with transporting staff to check against arm band.
  - b. Will be an identifying band also on the foot ; if patient a Level One Trauma from Emergency Department
2. Receive report from transporting nurse
  - a. Occurrence (Penetrating or Blunt Trauma)
  - b. Any known information (Allergies, Blood Received in field or Emergency Room)
5. **MTP activated**
  - a. Number of cooler infusing
  - b. **Type & Screen drawn & sent to Blood Bank**
  - c. Attending Anesthesiologist or Attending surgeon initiates the MTP via phone conversation to the Blood Bank (BB). (NOT via WIZ).
  - d. BB prepares the MTP products
  - e. Products in cooler will contain 6 units Packed Red Blood Cells (PRBC), 4 units Fresh Frozen Plasma (FFP) and outside cooler-1 pack Platelets
  - f. The BB will call the OR and inform them that the products are ready for pick up. This call from the BB to the OR will happen with each cycle of MTP
  - g. The primary circulator nurse contact the PST via phone or overhead page

- h. PST outside the operating room receives the patient’s blue card (if available) or patient’s sticker.
  - i. If the MTP has been initiated from a unit other than the OR(ED, SICU, 10N) the PST may be dispatched to the command center prior to the patient arrival to receive blood product form completed by the charge nurse.
  - j. The PST proceeds to BB and presents the blue card (if available) or patient’s sticker and completed blood bank form.
  - k. The MTP cycle will continue until the Attending Surgeon or Anesthesiologist request that the MTP be discontinued via phone call to the BB.
6. **Type and Screen sent to Blood Bank**
  7. C-Spine Precautions
  8. Antibiotics given
  9. Family; if known

**Transfer patient to Operating Room Table**

\*\*\*Anesthesia Count and Control Movement while supporting head\*\*\*\*

On Back Board:

1. Transfer on Board
2. Log roll off

Transfer without Back Board:

1. Log roll with roller

Secure patient on operating room bed via safety straps

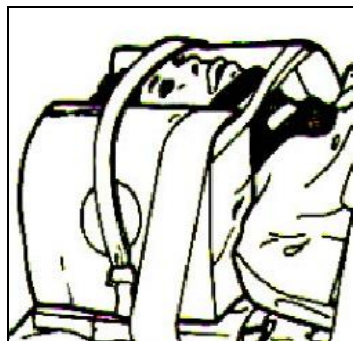
1. Usually lower thigh; above knees
2. If lower extremity vascular case; may have to strap above at abdomen or chest.
  - a. Clear with Trauma Surgeon where strap placed in special situations.

**Prior to Prep of patient:**

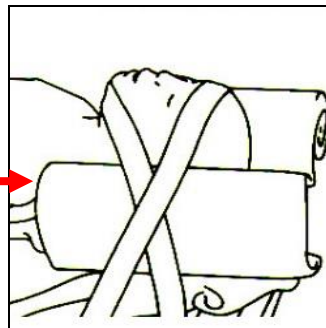
If not Intubated:

Primary Circulating Nurse or Secondary Circulator

1. C-Spine not cleared; Cervical Spine Stabilization
2. Assist Anesthesia Team; if needed for intubation

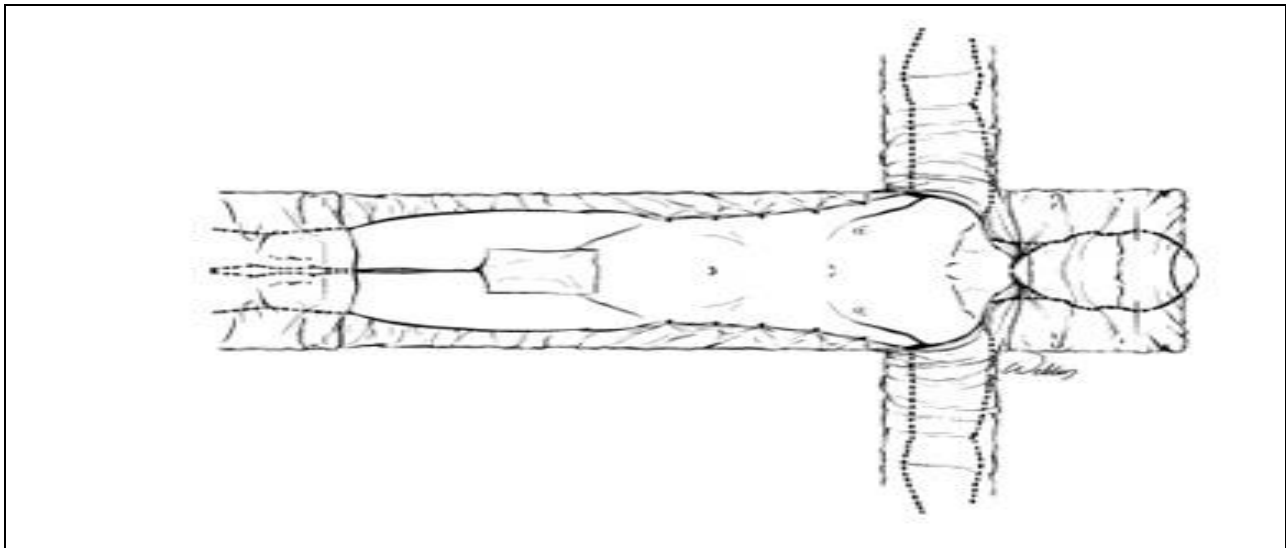


Stabilize with 10 pound Sandbags



Intubated:Primary Circulating Nurse or Secondary Circulator

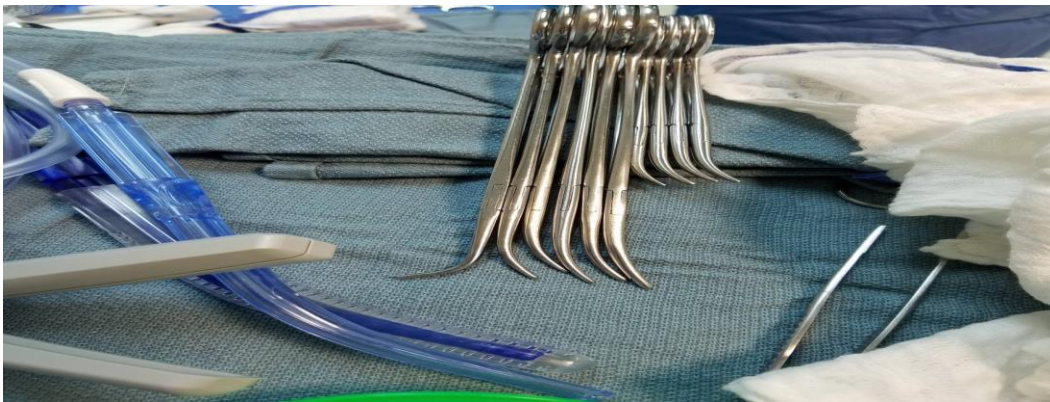
1. Prior to Prep Patient:
  - a. Insert foley
  - b. Place Bovie pad posterior thigh
  - c. Connect Bovie : Refer to Page 10
    - i. Set Bovie at 40 Cut/ 40 Coag; Blend & Spray
  - d. Second Bovie pad posterior calf; if expecting Argon
  - e. Clipper Patient hair; if necessary
2. Standard Trauma Prep with Chloraprep
  - \*\*Chin to knees\*\*
  - \*\*Axillary to side of thigh bilaterally\*\*



3. Facilitate Level One Time-Out
4. Assist Surgical Technologist (Scrub Technician) with any additional Items needed
5. IF MTP; check with Blood Bank on cooler and/ or need for Type & Screen
6. Monitor Sterile Field
7. Accurate record in VPMS throughout the procedure

Primary Scrub Technician

1. Predictability- Mayo Set Up
  - a. "No Matter What" set up Mayo Stand  
\*\*\*NOT Too Heavy\*\*\*
    - i. 20 Blade
    - ii. 2 Kelly Forceps
    - iii. 4 Vanderbilt Hemostats
    - iv. Metz Scissors
    - v. Straight Mayo Scissors
    - vi. 2 Pickups—Heavy DeBakeys
    - vii. 2.0 & 3.0 Ties on Vanderbilt Passer
    - viii. Storey for Right Angle Clamp
    - ix. 2 Sponge Sticks loaded with 4 x 8 Sponge
    - x. Big Rich



Surgeon Side Note:

**\*\*\*#1 Rule of Trauma\*\*\***

**\*\*\*Control Bleeding (Hemorrhage)\*\*\***

How? Packing Laps Stops, Contains, & Tamponades IMMEDIATE Bleeding

Why? Allows Anesthesia Team to catch up with Resuscitation

Allows Surgeon time to Plan

Allows Surgeon time to identify injuries

**\*\*\*KEEP LAPS COMING!!!\*\*\***

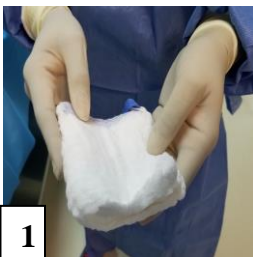
**\*\*\*Never have less than 20 Laps on the Sterile Field\*\*\***

Why? Surgeon needs many Laps to pack all 4 Quads of Abdomen OR Chest

2. Rest of the Set Up

a. 40 laps in Trauma pack

i. Half rolled—"Fold & Hand"



1

Single Lap



2

Fold the lap in half



3

Hand Folded Lap to

ii. Other Half of Laps

Unfold two edges of lap  
&  
Pull the ends of the edges



b. Extra bucket ready to "Pack & Dump" bloody Laps from Abdomen

## Surgeon Side Note:

## Why Particular Suture Chosen?

- 1<sup>o</sup> Minor Fine Bleeding Control
- 2<sup>o</sup> Control Contamination

- c. 2 Needle Drivers loaded 2.0& 3.0 Silk Short Pops



- d. “No time to Towel Out” Mayo Stand
  - e. 3 Towel Out Mayo Stand due to Silk Ties
    - i. One Towel on Drape
3. Don't Forget “Big Rich” & Sponge Sticks



## Quick Tip on loading a 4 x 8 sponge on sponge stick:

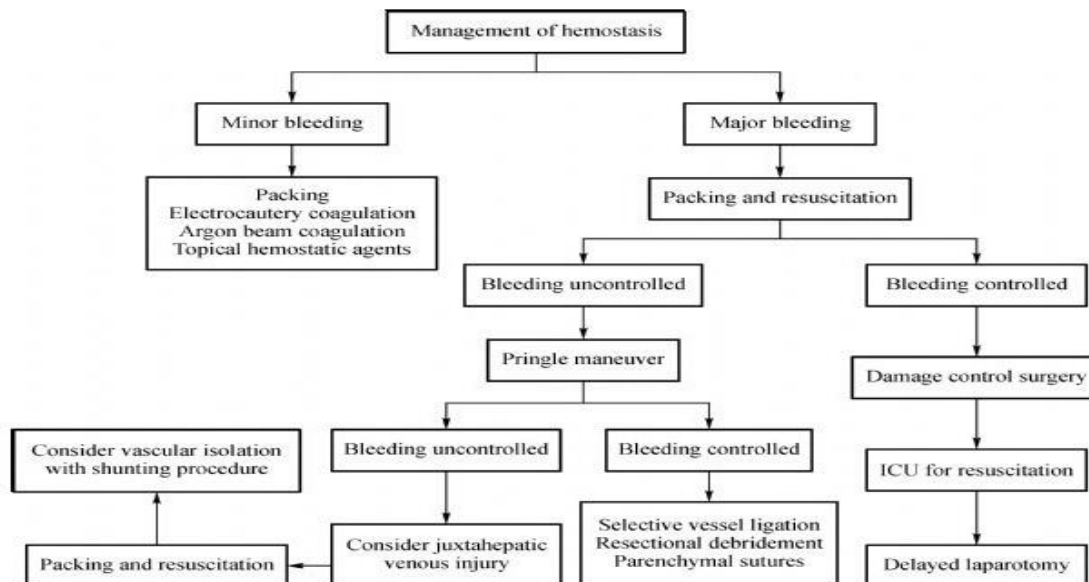
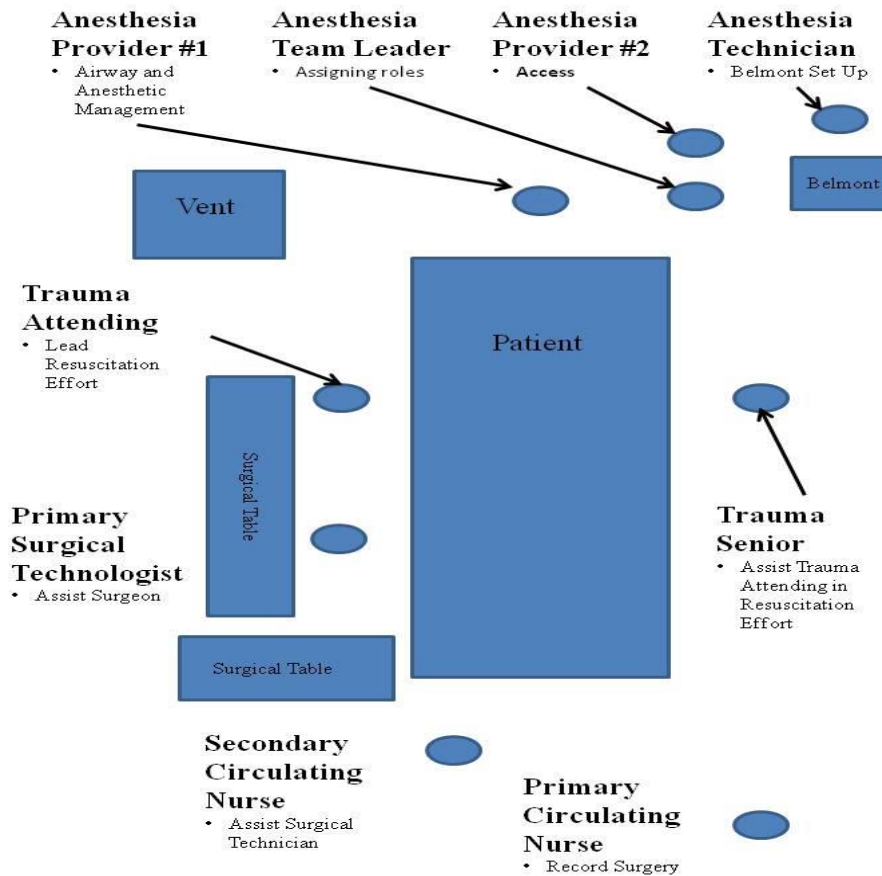
- 1) Fold 4 x 8 sponge in half
- 2) Roll edge closest to you upward
- 3) Roll edge farthest to you downward
- 4) Fold both edges in half

\*The blue radiopaque line shouldn't be showing\*

- 5) Stick the edges of the folded sponge over in the rings of the sponge sticks



**Positions Please**



**Intraoperative Abdominal surgery**

Primary Scrub Technician

# Bookwalter



Segmented Ring



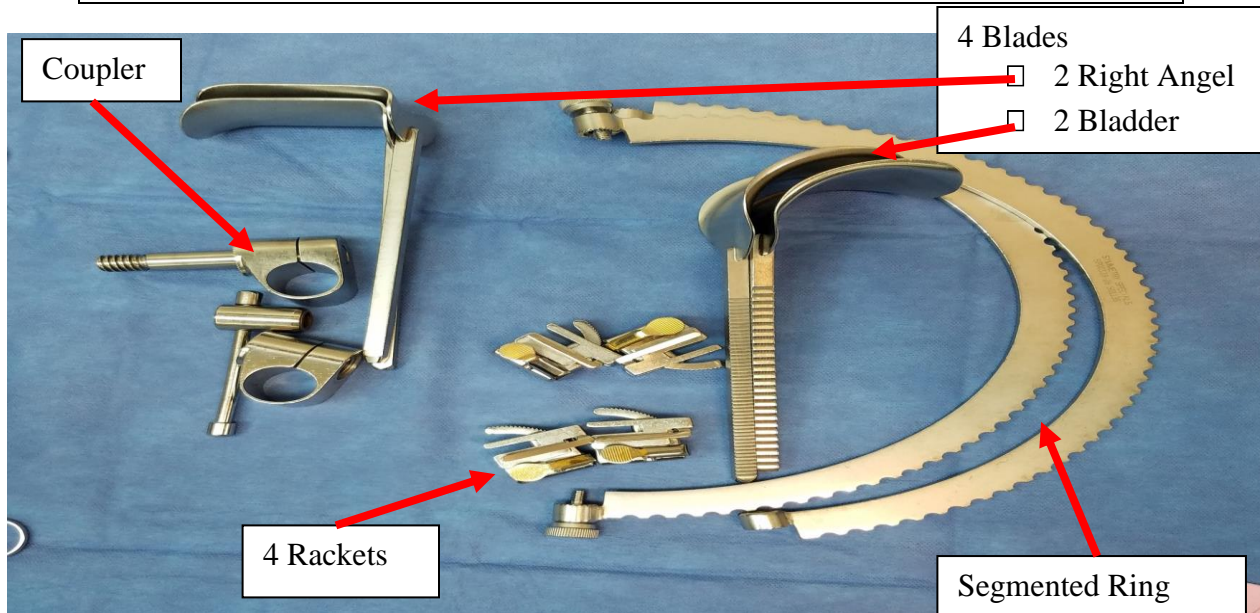
Blades with ratchets



a) Post  
b) Coupler  
c) Articulating Bar

Surgeon Side Note:

**Oval Ring** Located in Trauma Extra Instrument Cart—1<sup>st</sup> Row; Middle Shelf



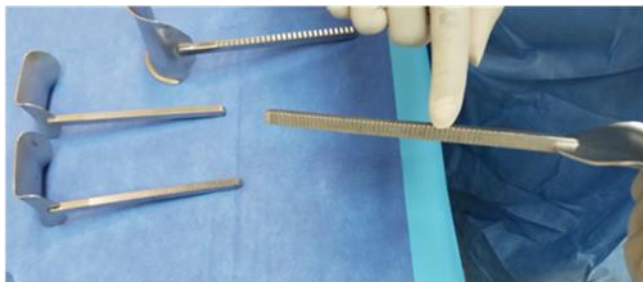
Coupler

4 Blades  
□ 2 Right Angel  
□ 2 Bladder

4 Rackets

Segmented Ring

First—Look for Rivets



Second—Clip under



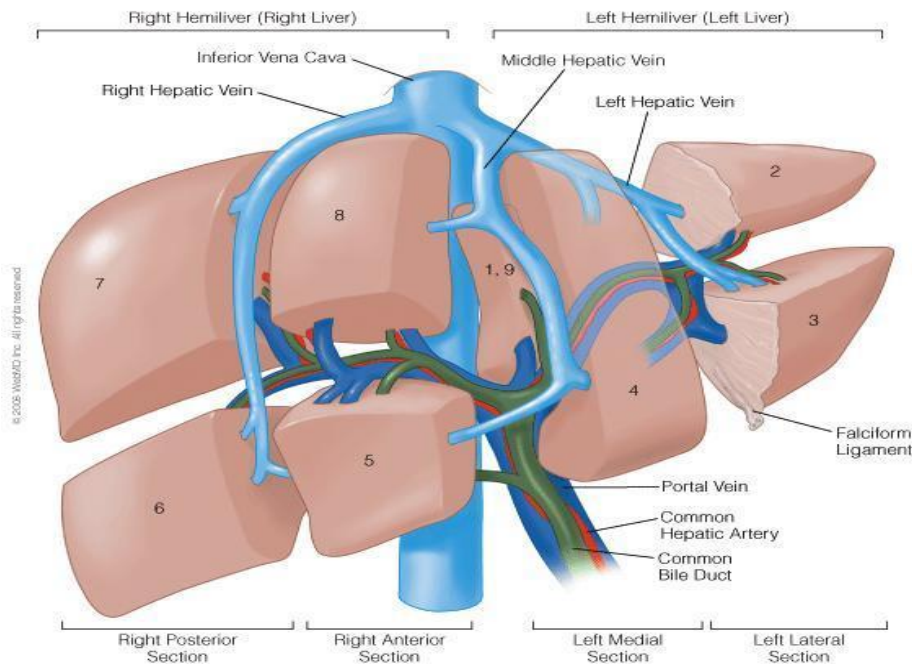
Last—Press Button to move up



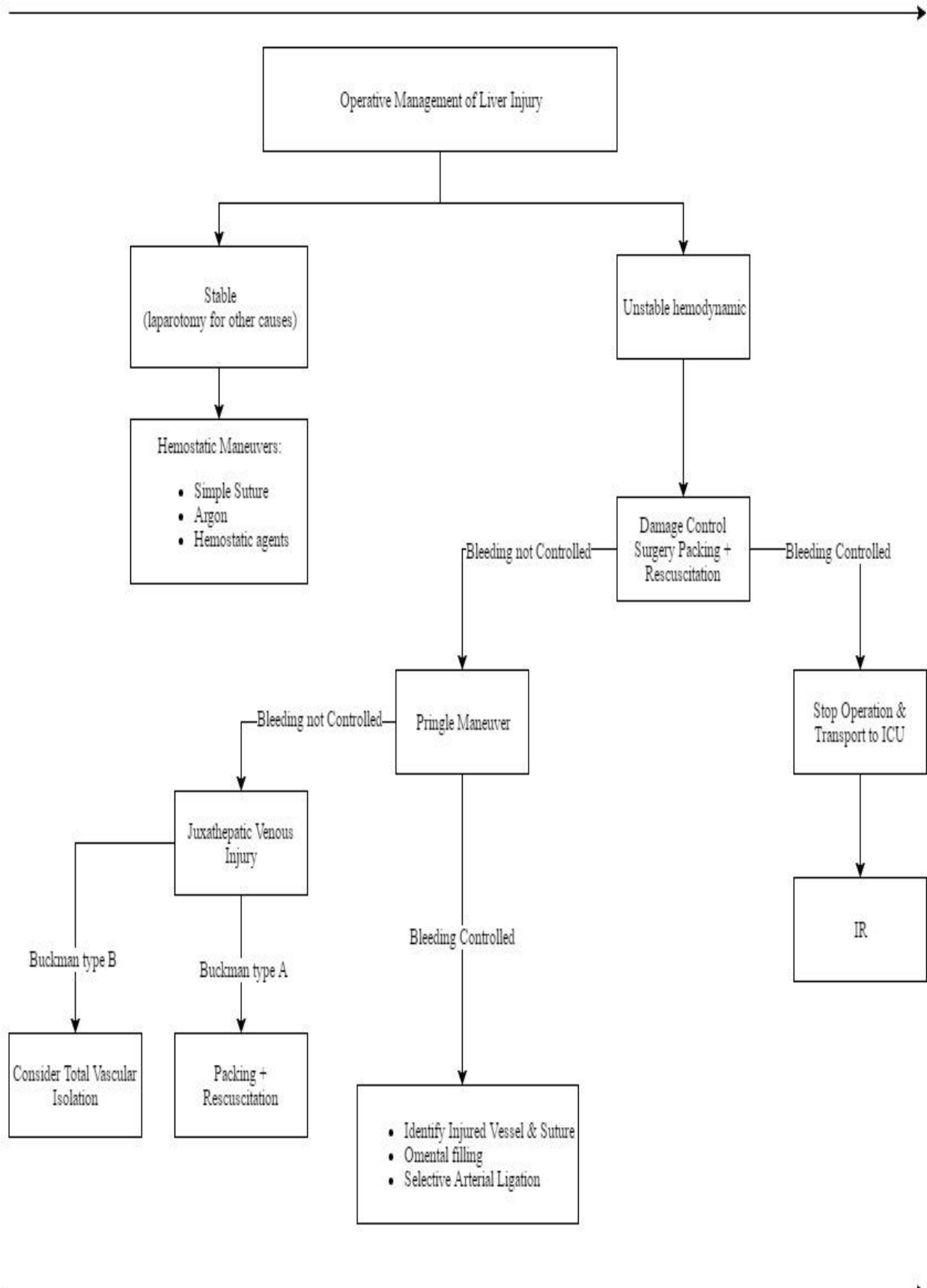
Coupler together



- |  |   |
|--|---|
| <ol style="list-style-type: none"> <li>1) Insert “b” into “a”</li> <li>2) Connect “c” into the screw of “a”</li> </ol> | <ol style="list-style-type: none"> <li>3) Turn “c” clockwise until teeth of “a” and “b” meet</li> </ol> |
|--|---|



<b>LIVER INJURY GRADING SCALE</b>	
<b>Grade</b>	<b>Description</b>
<b>I</b>	Capsular tear < 1 cm in depth
	Minor laceration of liver, initial encounter
<b>II</b>	Capsular tear 1-3 cm in depth < 10 cm length
	Moderate laceration of liver, initial encounter
<b>III</b>	Capsular tear > 3 cm in depth
	Major laceration of liver, initial encounter
<b>IV</b>	Parenchymal disruption 25-75% of hepatic lobe or 1-3 Couinaud's segments within a single lobe
	Major laceration of liver, initial encounter
<b>V</b>	Parenchymal disruption > 75% of hepatic lobe or > 3 Couinaud's segments within a single lobe Injury to retrohepatic vena cava
	Major laceration of liver, initial encounter



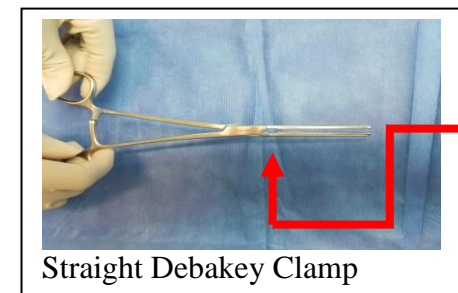
**Intraoperative Liver**

Primary Circulator

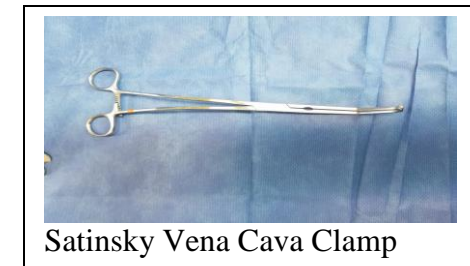
<b>Suture</b>	Chromic 0 BP-1
<b>Supply</b>	Hemostatic Gauze
	Ligasure IMPACT
	Extra Bovie Pad for Argon
<b>Equipment</b>	Argon
	Trauma Extras Pan
	Vascular Adult Thoracotomy Pan

Primary Scrub Technician

<b>Trauma Extras Pan</b>	
Aortic Clamp—Angle Debakey	For Pringle procedure
Vascular Tourniquet (Rummel)	In Peripheral Vascular II as well
<b>Vascular Adult Thoracotomy Pan</b>	
Aortic Clamp	Curved Glover
	Straight Debakey
	Satinsky Vena Cava Clamp

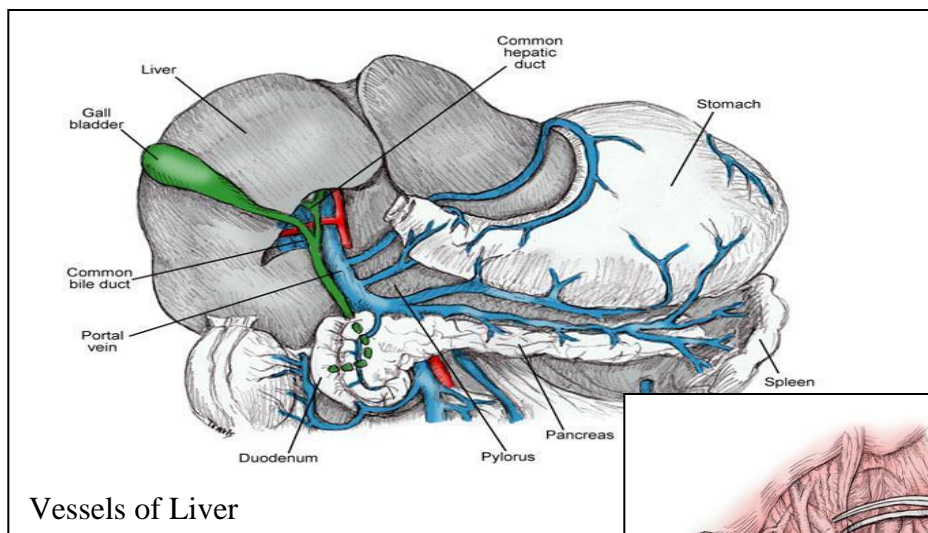


Straight Debakey clamp maybe mistaken for Kocher; look for hole and no teeth at the ends

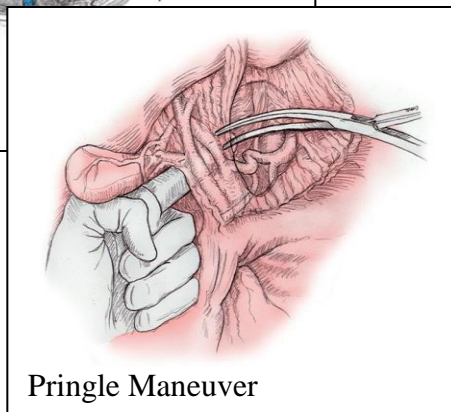


Surgeon Side Note:		
Hemostatics In Trauma Supply Cart	<input type="checkbox"/> Combat Gauze <input type="checkbox"/> NuKnit	<input type="checkbox"/> Surgicel <input type="checkbox"/> Fibrillar
Hemostatics in Main Core	<input type="checkbox"/> Evicel Kit	Evicel Bottles in Freezer
Ligasure NOT in Main Core	<input type="checkbox"/> Enseal	In Central Supply; Location 2H5A
		Ref # NSLX 120L
		Item # 133543
Triad Valley Bovie	80 Cut/ 80 Spray	

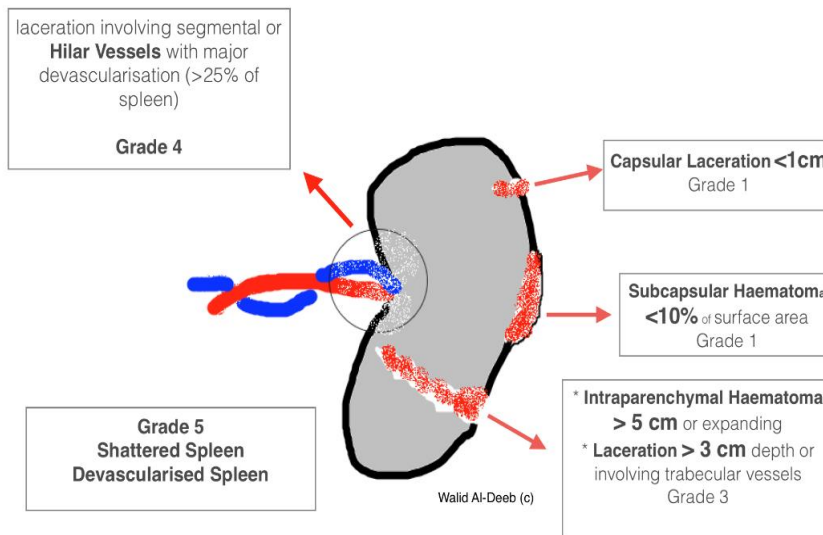
Surgeon Side Note:		
Pringle Maneuver	What?	<input type="checkbox"/> Technique to minimize blood loss during hepatic surgery by clamping the vascular pedicle
	When?	<input type="checkbox"/> Traumatic injury to the liver can result in massive hemorrhage
	Why?	<input type="checkbox"/> Allowing time for repair of the vessel
	How?	<input type="checkbox"/> Clamping of the hepatic pedicle



Vessels of Liver



Pringle Maneuver



SPLEEN INJURY GRADING SCALE	
Grade	Description
<b>I</b>	Capsular tear < 1 cm in depth
	Minor laceration of spleen initial encounter
<b>II</b>	Capsular tear 1-3 cm in depth; does not involve a trabecular vessel
	Moderate laceration of spleen, initial encounter
<b>III</b>	Capsular tear > 3 cm in depth; involving trabecular vessels. Ruptured subcapsular or parenchymal hematoma; intraparenchymal hematoma > 5 cm or expanding
	Major laceration of spleen, initial encounter
<b>IV</b>	Laceration involving segmental or 4 hilar vessels producing major devascularization (> 25% of spleen)
	Major laceration of spleen, initial encounter
<b>V</b>	Shattered spleen or hilar vascular injury which devascularizes spleen
	Major laceration of spleen, initial encounter



**Intraoperative Splenectomy**

Primary Circulator

<b>Suture</b>	3.0Prolene
<b>Supply</b>	Pledgets
	Suture Boots

Primary Scrub Technician

<b>Instruments</b>	Heavy Kelly X 2
	Needle Driver

Surgeon Side Notes:		
Expect Splenectomy	<input type="checkbox"/> Endo	3 to 5 <b>White</b> Loads
	GIA 45	
	or 60	
		Located in Main Core

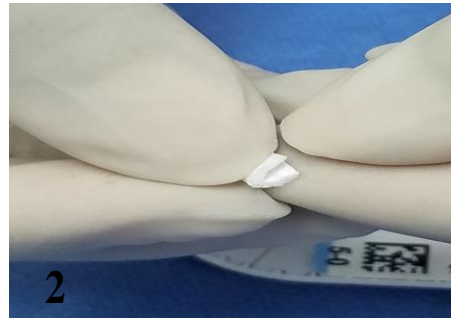
Surgeon Side Notes		
Multiple Vessels to Control		
#1 Largest		Splenic Hilum
#2 Classically Re-Bleeds		Short Gastric

# How to Load a Pledget



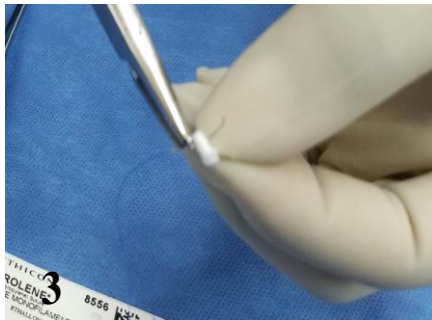
1

Load Prolene Needle



2

Fold Pledget in Half



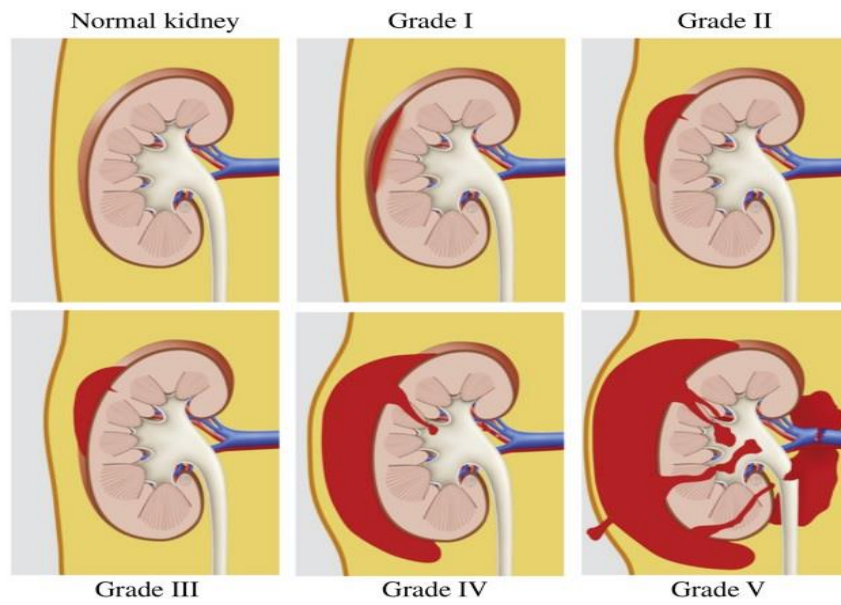
3

Drive Needle through both Halves of Pledget



4

Surgeon Side Notes:	
Repair	<input type="checkbox"/> Vascular
	<input type="checkbox"/> Cardiac
	<input type="checkbox"/> Spleen
	<input type="checkbox"/> Liver



<b>KIDNEY INJURY GRADING SCALE</b>	
<b>Grade</b>	<b>Description</b>
<b>I</b>	Microscopic or gross hematuria, urologic studies normal
	Subcapsular hematoma, nonexpanding without parenchymal laceration
<b>II</b>	Nonexpanding perirenal hematoma confined to renal retroperitoneum
	Laceration < 1 cm parenchymal depth of renal cortex without urinary extravasation
<b>III</b>	Laceration > 1 cm parenchymal of renal cortex without collecting system rupture or urinary extravasation
	Major laceration of kidney, initial encounter
<b>IV</b>	Parenchymal laceration extending through 4 the renal cortex, medulla, and collecting system
	Main renal artery or vein injury with contained hemorrhage
<b>V</b>	Completely shattered kidney
	Avulsion of renal hilum which devascularizes kidney

**Intraoperative Renal Artery bleed \*\*\*Very Similar to Spleen Prepared\*\*\***

Primary Circulator

<b>Suture</b>	3.0Prolene
<b>Supply</b>	Pledgets
	Suture Boots
	Double J Urethral Stent

Primary Scrub Technician

<b>Instruments</b>	Heavy Kelly X 2
	Needle Driver

Surgeon Side Notes:		
Other Abdominal Surgeries		
Any mesenteric	Plan	<input type="checkbox"/> Impact Ligasure or Enseal
		<input type="checkbox"/> Linear GIA 75mm Blue Load
	Always Possible	<input type="checkbox"/> Rummel Vascular Touriquet for Pringle maneuver
Small Bowel Resection	Plan Ostomy Supplies	<input type="checkbox"/> Ostomy Waffer in Main Core
		<input type="checkbox"/> Ostomy Pouch in Main Core

**Intraoperative Thoracotomy surgery** \*\*\*With ALL Thoracic--insert a Chest Tube\*\*\*

**Chest Tube Insertion**

Primary Circulator

<b>Suture</b>	0 Silk CT-1
<b>Supply</b>	Chest Tubes
	PleuroVac
	Suction Tubing

Primary Scrub Technician

<b>Instruments</b>	Vanderbilt
	Needle Driver

**Pericardial Window**

Primary Circulator

<b>Suture</b>	0 Silk CT-1
	2.0 Prolene MH
	2.0 Vicryl SH
	2.0 Vicryl CT-1
	Pledgets
<b>Supply</b>	Vessel Loops
	16 French Red Rubber Cath
	Asepto
	Blade for Cardiac Saw
<b>Instruments</b>	Trauma Extras
	Cardiac Stryker Saw
<b>Equipment</b>	White Stryker Saw Box—turn on right away

Primary Scrub Technician

<b>Trauma Extras Instrument</b>	
Long Allis	
Long Debakey Forcep	
Nelson Scissors	

**Anterolateral Thoracotomy**

Primary Circulator

<b>Position Patient</b>	Left Arm Above Head in Goal Field Position
<b>Suture</b>	0 Silk CT-1
	#1 Vicryl TP-1
	2.0 Vicryl SH
	2.0 Vicryl CT-1
<b>Supply</b>	Chest Tube
	Pleuro Vac
	Suction Tubing
	Universal Drape
<b>Instruments</b>	Trauma Extras
	Vascular Thoracotomy Pan

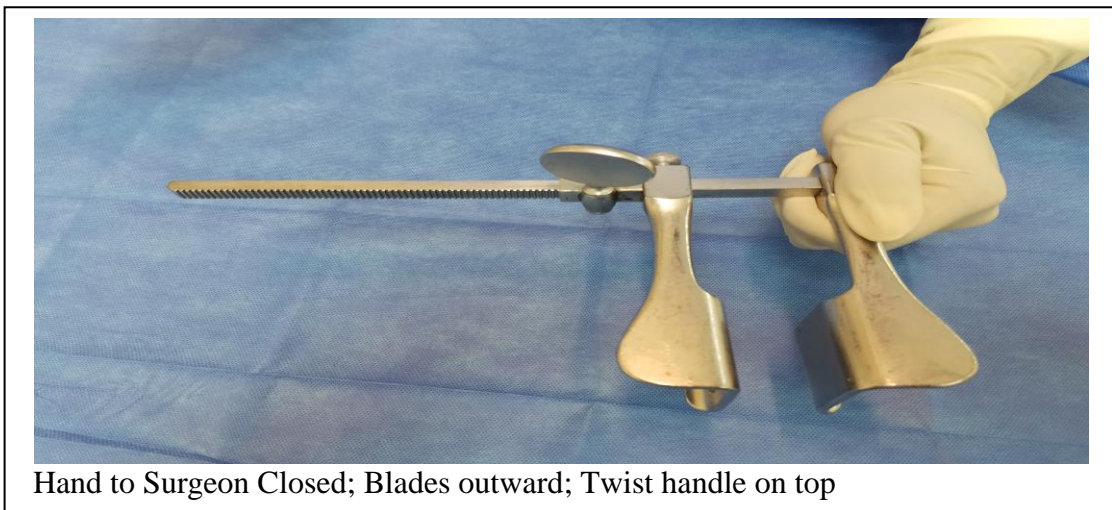
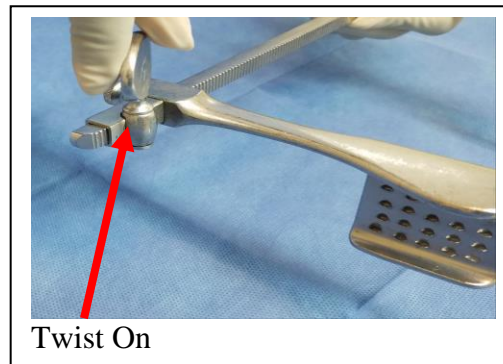
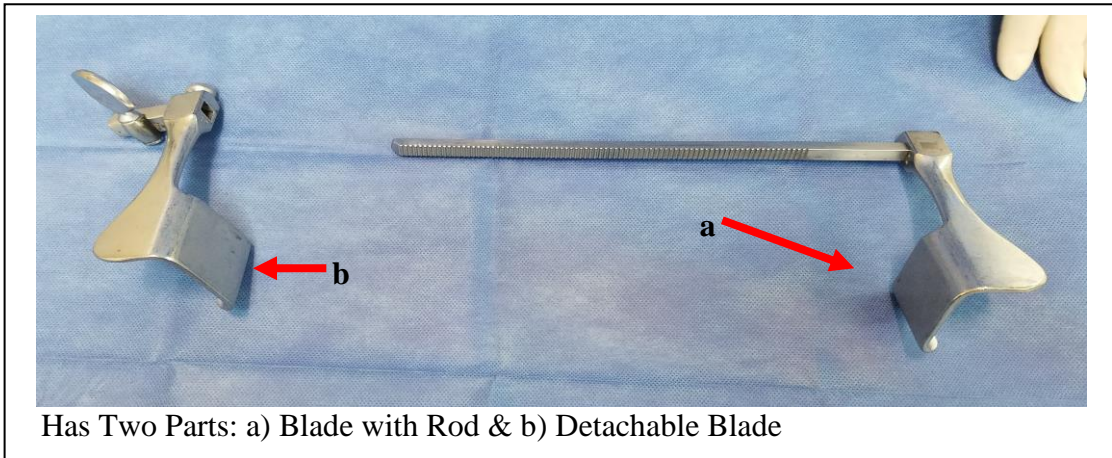
Primary Scrub Technician

<b>Knife Blade</b>	10 or 20
<b>Lap Pad</b>	
<b>Suction</b>	
<b>Bovie</b>	

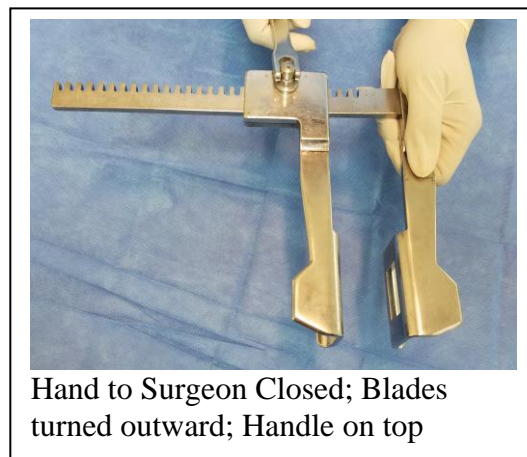
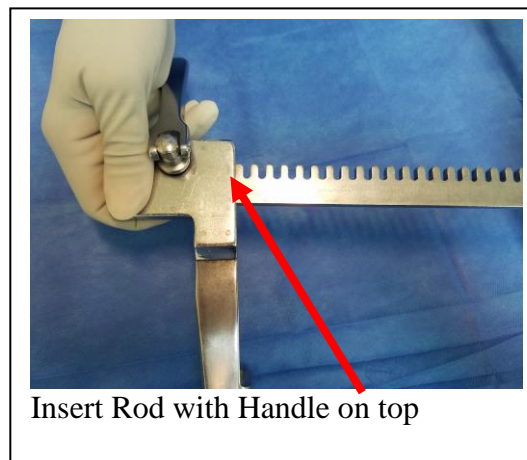
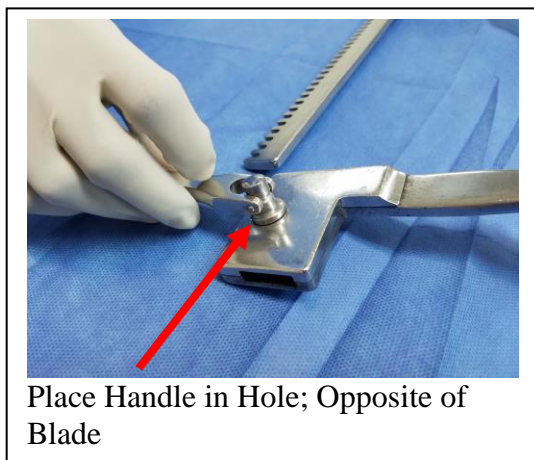
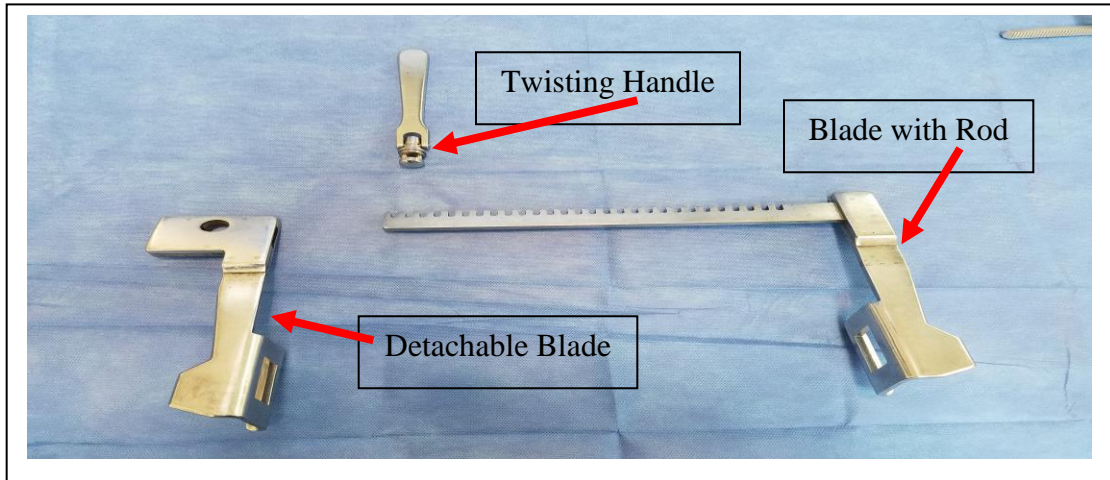
<b>Vascular Adult Thoracotomy Instrument</b>	
Tuffier Rib Retractor	Finochietto Rib Retractor
Duval Lung Serrated Forcep	Allison Lung Retractor "Egg Beaters"



### Tuffier Rib Retractor



### Finochietto Rib Retractor



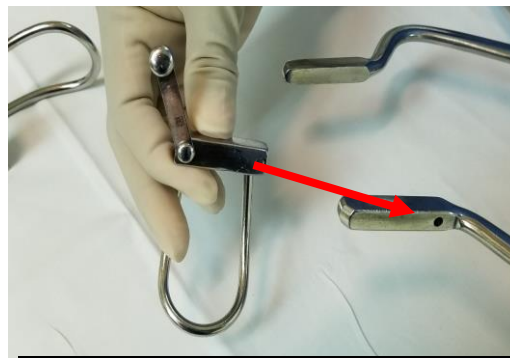


Trauma Extra Pan	
Lebsche Sternal Knife	Balfour Retractor
Mallet	Balfour Blades



Can Be Found In  
as separate Pan  
in Cardiac

Balfour Retractor with Blades \*\*\*IF Finochietto Rib Retractor NOT put together correct\*\*\*



Make Sure Holes match up



Blade face outward



Repeat other Blade

**Open Chest**

Primary Circulator

<b>Suture</b>	0 Silk CT-1
	#7 Sternal Wires
	2.0 Prolene MH
	3.0 Prolene SH
	Pledgets
	0 Vicryl CT-1
	Umbilical Tape
	Bone Wax
<b>Supply</b>	Chest Tube
	Pluerovac
	Suction Tubing
	Universal Drape
	16 French Red Rubber Catheter
	Stryker Saw Blade
<b>Instruments</b>	Stryker Sternal Saw
	Internal Paddles
	Trauma Extras Instrument Pan
	Vascular Adult Thoracotomy
	Trauma Ankenny Retractors
<b>Equipment</b>	White Stryker Box turned on

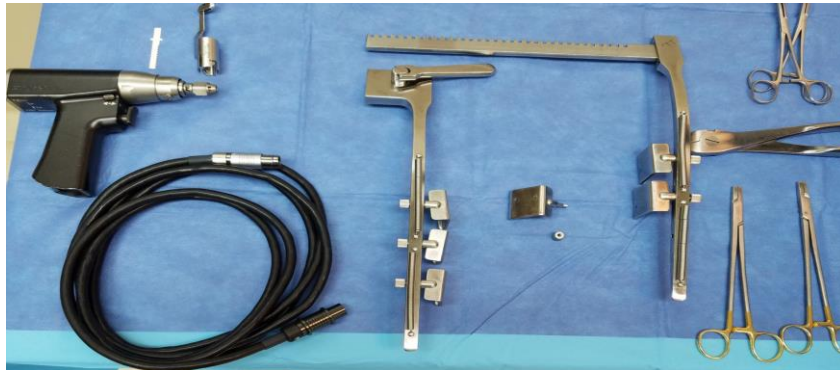
Primary Scrub Technician

<b>Knife Blade</b>	10 or 20
<b>Lap Pad</b>	
<b>Bovie</b>	
<b>Suction</b>	

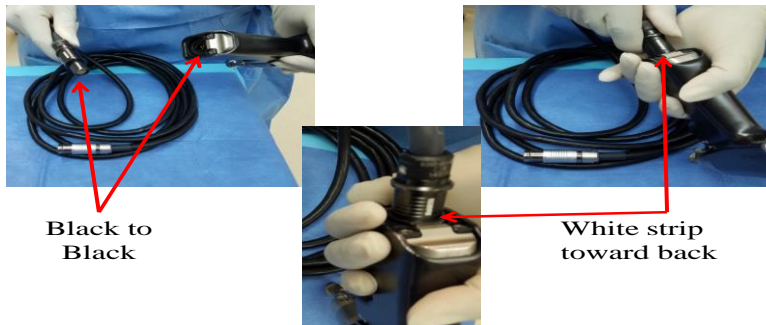
<b>Trauma Extras Pan</b>	
Aortic Clamp—Angle Debakey	For Pringle procedure
Vascular Tourniquet (Rummel)	In Peripheral Vascular II as well

<b>Vascular Adult Thoracotomy Pan</b>	
Aortic Clamp	Curved Glover
	Straight Debakey
	Satinsky Vena Cava Clamp
Note: Pictures of Clamps on page 29	

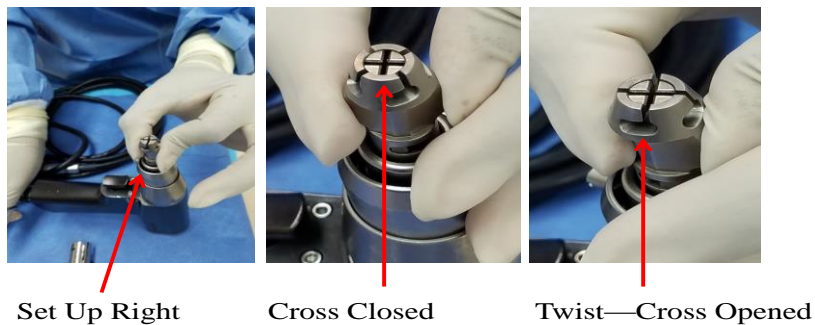
### Sternal Saw, Ankenny Chest Retractor, & Accessories



### Connecting the cable



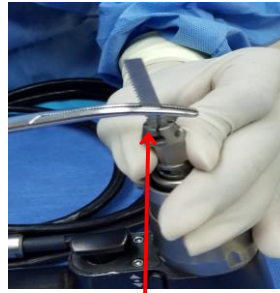
### Insert Saw Blade



### Insert Blade

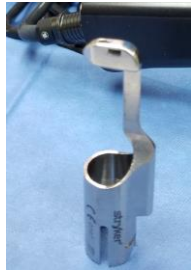


Hold Blade With Kelly Clamp

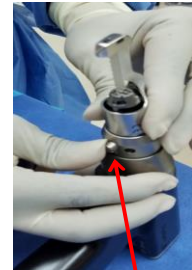


Place Blade Down

### Insert Safety Guard



Place On Saw



Twist Bottom Knob to lock in

### Check Safety on

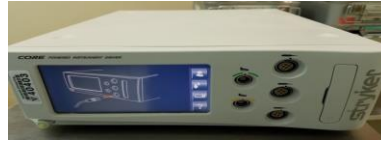


In middle to be in neutral

## Plug into White Box



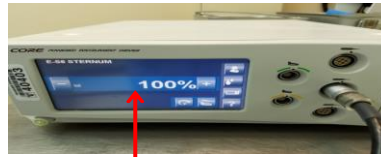
Silver End Hand off



Make Sure on

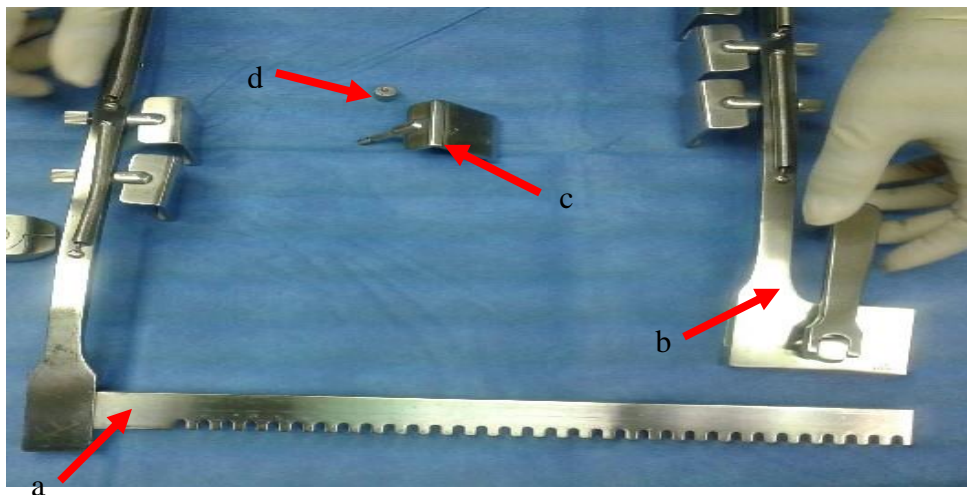


Red Button to Button

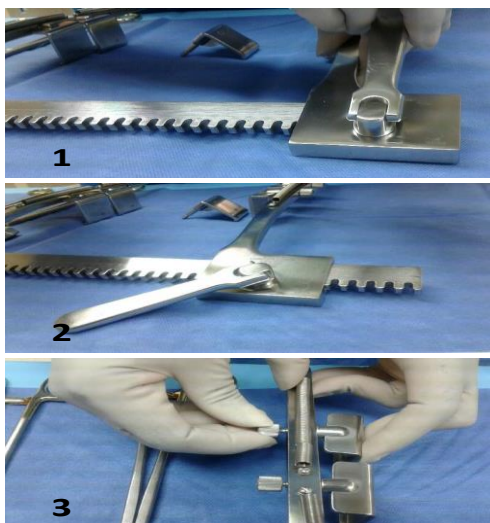


Read 100% if connected correct

## Put Together Ankenny Chest Spreader



a) Non-detachable ankenny frame b) Detachable arm with crank	c) Blade d) Screw
---	----------------------



- 1) Attach 'a' to 'b'
- 2) Turn handle on 'b' clockwise to attach 'a'
- 3) Insert 'c' through blade handle. Attach 'd' to outer end of 'c' and tighten

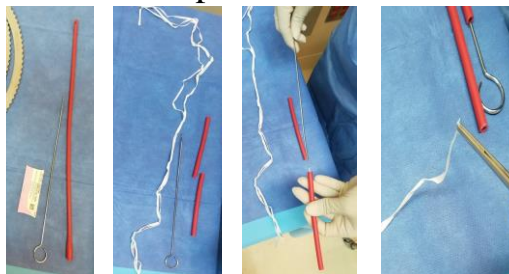
\*\*\*Blades are placed inward and tightened screws are placed outwards\*\*\*

- 4) Hand the retractor to the surgeon in the closed position

### How to prepare Rumel

- Cut tips off at both ends--throw off field
- Cut into 1/3 or 1/2
- Slide Rumel through—Ready!
- Moist U Tape at tip Vanderbilt Hemostat
- Followed by Rumel
- Have Heomstat (Heavy Kelly) ready to secure

### Prepare Rumel

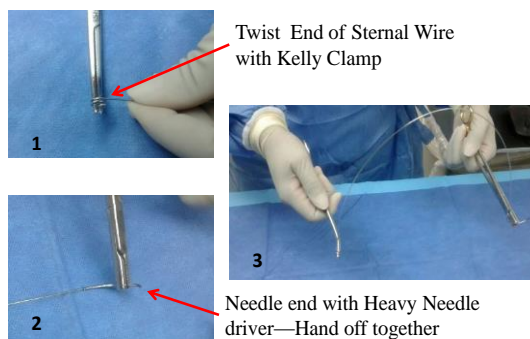


- Cut tips off at both ends--throw off field
- Slide Rumel through—Ready!
- Moist U Tape at tip Vanderbilt Hemostat

### How to Prep Chest Wires

- Two Heavy Needle Drivers out of Trauma Ankenny Chest Retractor Pan
- Lots of Kelly Hemostats
  - Can use Vanderbilt Hemostats
- Load Needle part of wire to Needle Driver
- Load other end to Kelly Hemostat
  - Twist end 3 to 4 times

### Prep Sternal Wires



Twist End of Sternal Wire with Kelly Clamp

Needle end with Heavy Needle driver—Hand off together

### Pass Sternal Wires to Surgeon

- Passed Sternal Wire to Surgeon with Needle Driver first
  - Have another Kelly Hemostat ready to hand to surgeon
- Towel
- Wire Cutter

Intraoperative **Trauma Tracheotomy**

Primary Circulator

<b>Position Patient</b>	Shoulder Roll
<b>Suture</b>	3.0 Silk Pop
<b>Supply</b>	Blue Rhino Kit
	16 Gauge Blunt Needle
	20 cc Syringe
	8 French Trach Tube
	Trach Tie Holder
<b>Instruments</b>	Adult Tracheostomy Pan

Primary Scrub Technician

<b>Knife Blade</b>	10 or 20
<b>Lap Pad</b>	
<b>Bovie</b>	
<b>Suction</b>	

Surgeon Side Notes:

Have Available  6 French DCT Cuffed Endotracheal Tube



Blue Rhino Kit



Cook Product



Main Core





**Post Operative Care:**

Surgeon Side Notes:		
Check Charge Nurse Called for Bed	Trauma ICU	Go Direct After Complete Surgery
Have Ready for Transport	<input type="checkbox"/> Monitor	Retrieved by Anesthesia Tech
	<input type="checkbox"/> Oxygen Tank	Retrieved by Anesthesia Tech Check $\geq$ 1000 PSI
	<input type="checkbox"/> Ambu Bag	Retrieved by Anesthesia Tech Available on Back Anesthesia Machine

**VAC Pack  
(Old School Open ABD)**

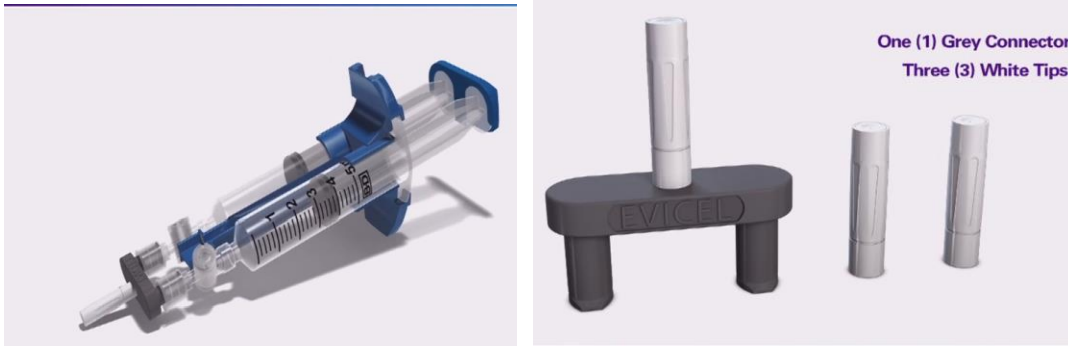
- 2 White Towel—one moist
- One Large Ioban
- Drape spray
- 10 mm flat fluted JP x 2
- Hand Grenades x 2

---

Surgeon Side Notes:		
ABThera	<input type="checkbox"/> Suction Canister	Main Core
	<input type="checkbox"/> ABThera Sponge Kit	Main Core
	<input type="checkbox"/> ABThera Machine	Order Early from Central Supply

**Evicel:**

- Is stocked in the Main Core.
- Comes in **two pieces**: the Evicel **Kit** and the Evicel **bottles** located in the freezer.
- Evicel Kit has **directions on the peel away lid** on usage for the scrub tech.



**EVICEL® Fibrin Sealant (Human) must be loaded with biologics while the 6 cm tip is in place.**

**Do not depress plungers to remove air bubbles or prime device, because the two biologic components will premix in the white spray tip, forming a fibrin clot that prevents spraying.**

**Do not apply EVICEL® intravascularly.**

**Life-threatening thromboembolic complications may occur if the product is unintentionally applied intravascularly.**

**Apply continuous pressure. If expression is stopped for any reason, change the white spray tip. Do not continue pushing plungers in an attempt to clear the fibrin clot within the white tip; otherwise the application device may become unusable.**

## **EVICEL® Fibrin Sealant (Human)**

### **IMPORTANT SAFETY INFORMATION**

#### **Indication**

EVICEL® Fibrin Sealant (Human) is indicated as an adjunct to hemostasis for use in patients undergoing surgery, when control of bleeding by standard surgical techniques (such as suture, ligature, or cautery) is ineffective or impractical.

#### **Contraindications**

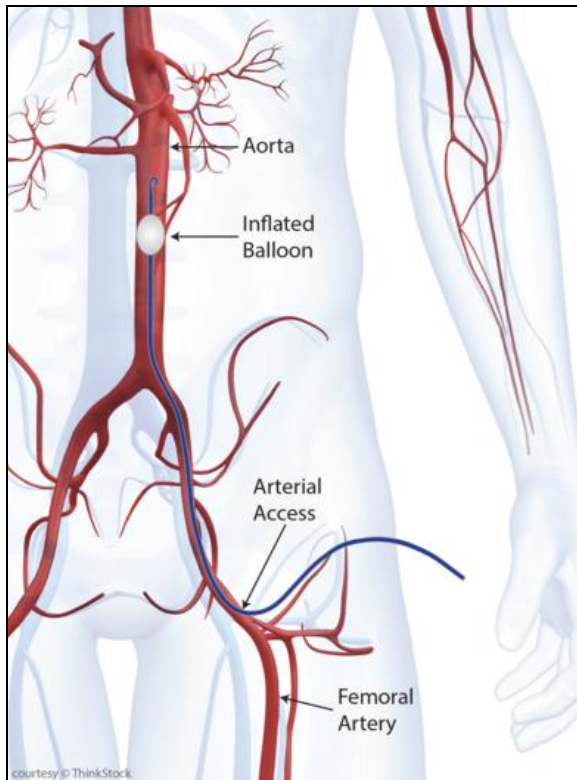
- Do not inject directly into the circulatory system. Intravascular application of EVICEL® may result in life-threatening thromboembolic events.
- Do not use in individuals known to have anaphylactic or severe systemic reaction to human blood products.
- Do not use for the treatment of severe or brisk arterial bleeding.
- Do not use EVICEL® for spraying in endoscopic or laparoscopic procedures where the minimum recommended distance from the applicator tip to the target site cannot be ensured.

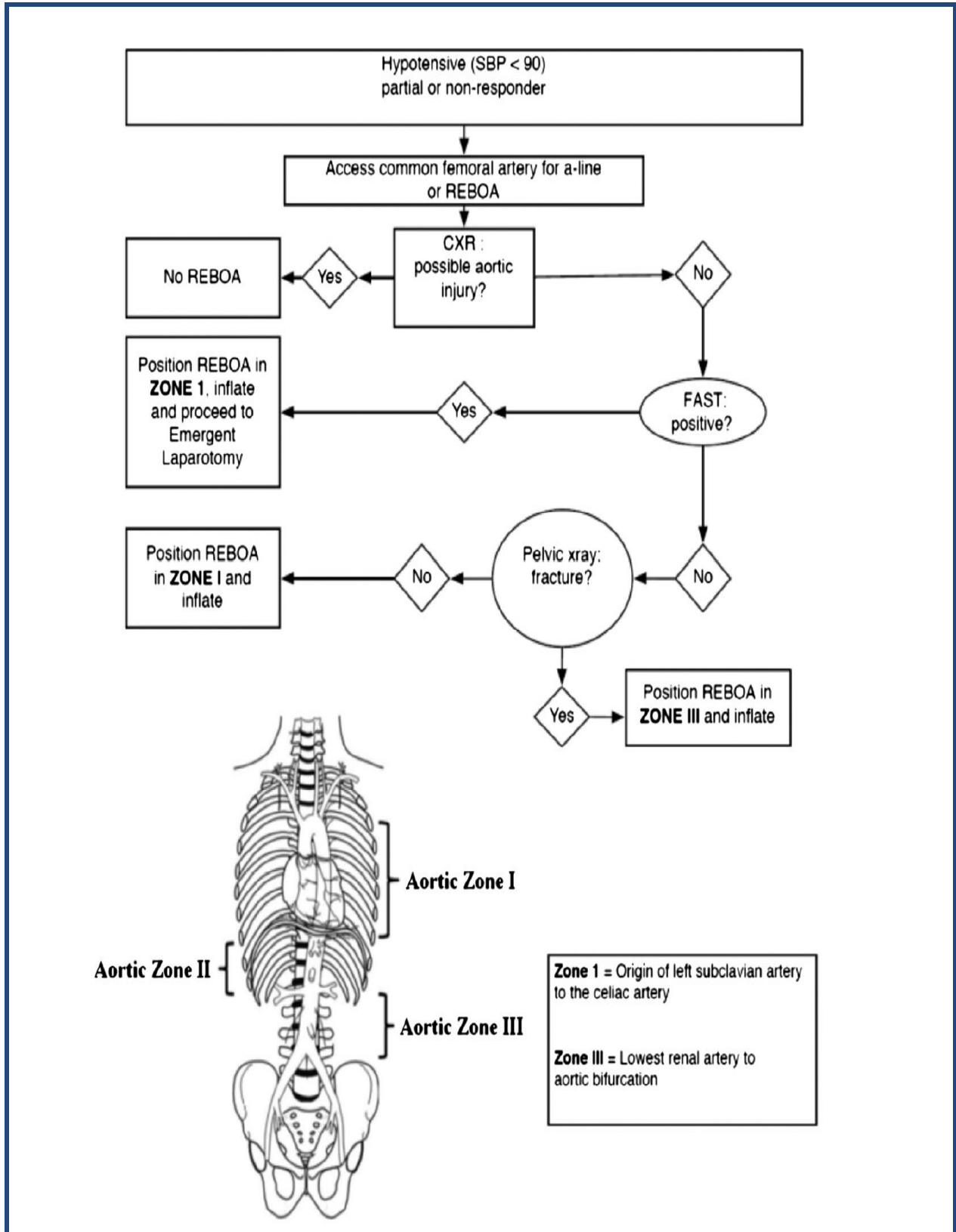
#### **Warnings and Precautions**

- Life-threatening gas embolism has occurred with the use of spray devices employing pressure regulator to administer fibrin sealants. These events appear to be related to the use of the spray device at pressures higher than recommended and/or at distances closer than recommended to the surface of the tissue. Follow labeled application instructions regarding pressure range and distance when using a spray device and monitor patients for the possibility of gas embolism.
- Monitor changes in blood pressure, pulse oxygen saturation, and end-tidal CO<sub>2</sub> when spraying EVICEL® because of the possibility of gas embolism.
- To reduce the risk of potentially life-threatening gas embolism, spray EVICEL® using only pressurized CO<sub>2</sub> gas at the recommended pressures and distances.
- Use EVICEL® spray application only if it is possible to accurately judge the spray distance, especially during endoscopic or laparoscopic procedures. Apply as a thin layer.
- Prior to applying EVICEL®, dry surface areas of the wound by standard techniques (e.g. intermittent application of compresses, swabs, use of suction devices). Prepare and administer EVICEL® according to the instructions and only with devices recommended for this product.
- May carry a risk of transmitting infectious agents, e.g. viruses, the variant Creutzfeldt-Jakob disease (vCJD) agent and theoretically, the Creutzfeldt-Jakob disease (CJD) agent.

**Resuscitative Endovascular Balloon Occlusion of the Aorta--REBOA:**

**Goal:** Minimal Invasive technique using balloon catheter to temporarily occlude large vessels and control hemorrhage for traumatic arrest and hemorrhagic shock.





- ❑ Prepare the balloon lumen with **inflation medium** as follows:
  - a. Attach syringe with inflation medium and open the stopcock on balloon lumen.
  - a. Purge all air from the balloon using standard techniques.
  - b. Completely deflate the balloon and close the stopcock.
  - c. Disconnect the syringe and purge air from the syringe. Refill the syringe with up to **24 cc (maximum inflation volume)** of inflation medium and reconnect the syringe.
- ❑ Slide the peel-away sheath towards the catheter distal tip to fully enclose and straighten the P-tip™. Connect pressure sensor and flush the arterial line.
- ❑ Insert the peel-away sheath and catheter into the introducer sheath approximately 5mm. Advance the catheter 17 cm into the introducer sheath, then slide the peel-away sheath toward the catheter hub. If necessary, pull tabs to separate the peel-away sheath from the catheter shaft.
- ❑ Under **fluoroscopy** and using standard technique, advance the catheter to the desired position using radiopaque indicators.
- ❑ Refer to the balloon inflation parameters table as a guide. Do not exceed maximum inflation volume. Over- inflation of the balloon may result in damage to vessel wall and/or vessel rupture and/or balloon rupture.

Table 1: Balloon Inflation Parameters

Balloon Diameter	Inflation Volume
15 mm	5 cc
20 mm	8 cc
25 mm	13 cc
30 mm	20 cc
32 mm (MAX)	24 cc (MAX)

- ❑ **Under fluoroscopy, carefully inflate the balloon with inflation media.** Monitor the pressure feedback on the syringe plunger while inflating the balloon. Do not force excessive fluid into the balloon as this may cause the balloon to become over inflated. Over-inflation of the balloon may result in damage to vessel wall and /or vessel rupture and/or balloon rupture.
- ❑ Secure the Catheter to the patient appropriately using standard techniques to prevent device migration.

### **Balloon Deflation, Withdrawal and Removal**

- ❑ Completely deflate the balloon by opening the balloon stopcock and drawing vacuum using the syringe. **Verify that the balloon is fully deflated using Fluoroscopy.** Close the stopcock.
- ❑ Disengage or detach the method/device used to secure the catheter to the patient.

- Carefully Withdraw the catheter until the catheter has been completely removed from the introducer sheath using standard techniques. The Catheter may be rotated during withdrawal to ease removal through the introducer sheath.
- Remove introducer sheath and close access site using standard techniques.
- Secure the catheter to the patient appropriately to prevent device migration.
- Ensure that the balloon is COMPLETELY deflated and stopcock closed before withdrawing through the sheath.
- After use, the device may be a potential biohazard. Handle and dispose of it in accordance with accepted medical practice and with applicable local, state and federal laws and regulations.
- Introducer sheath (7 Fr minimum)- Confirmed compatible

7FR Introducer Sheath - Confirm Compatibility			
<i>Known Compatible (7 Fr)</i>		<i>Known Incompatible (7 Fr)</i>	
071101A	Medtronic Input® Introducer Sheath	G07431	Cook Check Flo® Introducer
402-607X	Cordis Avanti®+ Sheath Introducer	AK-9701	Arrow Super Arrow-Flex® Sheath Introducer
406108	St. Jude Fast-Cath® Hemostasis Introducer	406702	St. Jude Fast-Cath® Introducer w/Cath-Lock & Guidewire
PRO-7F-11	Merit Medical™ Prelude Pro Sheath Introducer		
RSB702	Terumo® Pinnacle R/O II Radiopaque Marker		
CL-07711	Arrow Super Arrow-Flex® Sheath Introducer		
70-7130	Terumo® Pinnacle w/21g micro puncture needle (SS wire)		
PSI-7F-11-035	Merit Medical™ Prelude Sheath Introducer		

- Access needle/ Micro puncture introducer set
- Catheter Securing Device – e.g., Arrow 5FR Catheter Clamp
- 20-35 cc syringe (30 cc suggested)
- Inflation medium
  - 0.9% Sodium Chloride
  - 3:1 diluted contrast solution (75% sodium chloride (saline) / 25% Iodinated Contrast Medium (Optional))
- Suture –e.g., Ethicon Perma-Hand

- Vital signs monitor with external pressure monitoring sensor and appropriate pressure monitoring extension tubing

## Coding and Reimbursement



### Coding for REBOA Procedure

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CPT code 37244 is the most appropriate code to describe use of the REBOA catheter for occlusion of the aorta.

**37244:** Vascular embolization or occlusion, inclusive of all radiological supervision and interpretation, intraprocedural roadmapping, and imaging guidance necessary to complete the intervention; for arterial or venous hemorrhage or lymphatic extravasation.